



land

Central Places and Un-Central Landscapes

Political Economies
and Natural Resources in
the *Longue Durée*

Edited by
Giorgos Papantoniou and Athanasios K. Vionis
Printed Edition of the Special Issue Published in *Land*

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Special Issue Editors

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Athanasios K. Vionis

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About the Special Issue Editors

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Preface to “Central Places and Un-Central Landscapes”

The idea for the creation of the present Special Issue sprang during a session held in the framework of the 19th International Congress of Classical Archaeology held in Cologne/Bonn, 22–26 May 2018. This meeting was intended as a first gathering for a fertile discussion of evidence from a wide geographical spectrum, theory, and methods. The ultimate intention was the creation of a collection of peer-reviewed studies that could bring together central place theory, un-central landscapes, political economies, and natural resources in the *longue durée*; and, towards this goal, further studies were added to the volume, over and above those presented during the conference.

This is the result of an ongoing research collaboration, long discussion, and exchange of expertise between the two editors: Originally working on different chronological periods and geographic regions, the last few years we have attempted to establish common research projects, networks and study centers (ArtLands Lab, UnSaLa and SeSaLaC), developing complementary methods and approaches, and provoking cross-fertilization between the disciplines we represent.

This volume would not have materialized without the generous contribution of Prof. John L. Bintliff, who acted as a discussant during the Cologne/Bonn meeting, offering critical reviews and challenging the main concepts of the volume. We also wish to thank our authors, and especially our anonymous peer-reviewers who enthusiastically—and with full dedication—got engaged in the project. We are grateful to *Land* and its assistant editors for their efficiency, availability and support. Copy-editing was fully undertaken by the *Land* editorial team. We, as Special Issue editors, were responsible for the meticulous peer-review process (by three or four anonymous reviewers in each case), the content, and the final approval of each article. As an abstract precedes each contribution, we found it unnecessary to summarize, one by one, the contents of the volume in our introductory article. Instead, we have chosen to point out the main features covered in the volume, moving away from model-bounded approaches, and bringing central places and un-central landscapes together. We hope that we have succeeded in offering to our authors, and to landscape historians and archaeologists in general, a useful work-tool for the years to come.

Giorgos Papantoniou, Athanasios K. Vionis
Special Issue Editors

Editorial

Central Place Theory Reloaded and Revised: Political Economy and Landscape Dynamics in the *Longue Durée*

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1. Introduction

The aim of this contribution is to introduce the topic of this volume and briefly measure the evolution and applicability of central place theory in previous and contemporary archaeological practice and thought. Thus, one needs to rethink and reevaluate central place theory in light of contemporary developments in landscape archaeology, by bringing together ‘central places’ and ‘un-central landscapes’ and by grasping diachronically upon the complex relation between town and country, as shaped by political economies and the availability of natural resources.

It is true that 85 years after the publication of Walter Christaller’s seminal monograph *Die zentralen Orte in Süddeutschland* [1], the significance of his theory has been appreciated, modified, elaborated, recycled, criticised, rejected and revised several times. As Peter Taylor and his collaborators [2] (p. 2803) have noted, “nobody has a good word to say about the theory”, while “the influence of a theory is not to be measured purely in terms of its overt applications”. Originally set forth by a German geographer, central place theory, once described as geography’s “finest intellectual product” [3] (p. 129), sought to identify and explicate the number, size, distribution and functional composition of retailing and service centres or ‘central places’ in a microeconomic world [4] (p. 187). A few years later, the German economist and location theorist August Lösch [5] expanded the theory by inverting the system and by bringing lowest-order units (such as self-sufficient farms) to the fore, while illustrating how from small-scale economic activities there derived several central place systems.

The ‘unfashionability’ of central place theory (and of positivist approaches thereafter) in different phases throughout the period of its evolution and evaluation, especially in the 1970s and 1980s [4] (pp. 204–209), is explained by the fact that Christaller perceived central places as uniformly distributed, equally affluent and perfectly competitive spaces. Such central places provided their surrounding areas with goods and services, in an unbounded and isotropic world, where transport costs were proportional to distance from the main market [1] (pp. 28–30), [6] (p. 125), [7] (pp. 7–8). Despite all revisions and adjustment of the theory, however, what remains paramount in archaeological research related to landscape and catchment analysis, settlement hierarchy and economic systems, is the aspect of ‘centrality’. As noted by Ronald Rood [8] (p. 32), the village church, a square and local market are all examples of central places, thus, central place theory has both intra- and inter-site applications.

It is understood that the idea of ‘centrality’ and the creation of ‘central functions’ ultimately result in the creation of a hierarchy of sites [9] (p. 47), such as cities and town-markets, gateway cities, hamlets, farms and the outside world [7] (p. 13). Although Christaller’s economic model basically neglected environmental and cultural considerations [8] (pp. 33–34), [10] (p. 10), settlement hierarchy and the locational relation between settlements and water sources, arable and grazing land, fuel and building material [9] (p. 48), [11] (p. 115) remain of utmost importance in landscape archaeology and spatial analysis to today.

Another German tradition, historical geography [12,13], has shown that microenvironments with natural boundaries (e.g., rivers, mountains and woods) and desirable resources (e.g., water, arable land and minerals) sustained nucleated communities and remained occupied for almost every period. The potential shifting microlocation of settled communities within the same ‘settlement chamber’ or *Siedlungskammer* was “a conjunction of natural geographic opportunities and the specific economic and political context of the culture concerned” [14] (p. 148). It is noteworthy that there is an instinctive association between a hierarchical system of settled spaces, environmental and topographical parameters, the availability of and control over natural resources and the construction of dependent territories around central places within their settlement chambers. On the other hand, ‘central person’ may be as important as ‘central place’ [15] (p. 315), [16] (p. 159) and this is where the concept of ‘political economy’ evolves. As Timothy Earle has eloquently argued in different occasions, economic theories should recognise that, to whatever degree realised, power strategies were built on economic and ideological control over resources [17–19].

Moving away from model-bounded approaches, central place theory is used here more flexibly to include all the places that may have functioned as spaces of economic or ideological centrality (even in a local context) in the past, including urban centres, agro-towns, countryside settlements, burial and ritual topoi. The idea of this volume derives from the methodological and theoretical frameworks we employ when approaching landscape phenomena and archaeological evidence from the Xeros River valley in Cyprus, in the framework of our Settled and Sacred Landscapes of Cyprus (SeSaLaC) archaeological project [20–22]. Given that landscape archaeology and intensive field-survey methodologies have evolved, providing more spatial, functional and chronological detail about the archaeological record for a given region, combined with a constant revision and refinement of ceramic chronologies, settlement archaeology and pottery distributions prove accurate tools for the exploration of landscape transformations and settlement systems. The contextualisation and evaluation of settlement-change diachronically is examined here within a multilayered framework or along five main strands of interrelated approaches: (a) *Siedlungskammer* or ‘settlement chambers’, (b) ‘central place theory’ and settlement hierarchies, (c) ‘ecosystems’ and land-use, (d) ‘sacred landscapes’ and (e) ‘political economy’.

2. Landscape Archaeology, *Siedlungskammer* and Community Area Theory

Landscape archaeology overcomes the conventional boundaries between disciplines such as anthropology, history and geography, and provides a fresh perspective and a powerful investigative tool to address research questions related to the conscious and the unconscious shaping of the land and the processes of organising space, involving interaction between the physical environment and human presence [23] (p. 75). Temporality, spatiality, materiality and site-based analysis are all encompassed in the concept of landscapes, and therefore through its study much can be said about human responses to the changing conditions of life in the *longue durée*. It would not be possible to cite here the vast bibliography on the evolution of landscape archaeology and settlement research, and how developments in those fields (theoretical, technical and epistemological) have contributed to converting earlier ‘traditional’ approaches into a more advanced field of enquiry [14,24–26]. We should note, however, that the spatial interrelationship of artefacts, features and human societies through time, together with a special focus in the study of microlandscapes or microregions [27] (pp. 3–14), all have comprised special areas of research in the field of landscape archaeology since the late 19th century.

As John Bintliff [28] has recently argued, the careful study of the *longue durée* of integral landscapes is the only way to achieve meaningful time-depth. Here the concept of *Siedlungskammer* is fundamental. As noted above, according to the German model of *Siedlungskammer* or ‘settlement chamber theory’ of the *Landeskunde* School (‘landscape-lore’) of historical geography, large areas of land with natural boundaries and desirable resources sustained nucleated communities and remained occupied for almost every period. Landscape archaeology aims at recognising shifts in the location of the main settlements within each ‘settlement chamber’ or microregion, and has verified that

the relocation of habitation sites from one period to another are always detected within the same microregion [14,29]. The diversity of landscapes would have attracted human communities to create nucleated (or other) settlements often in or around certain physical topographies, soil types or natural paths of communication, while settlements would have appeared, disappeared and relocated within the same settlement chamber according to prevailing natural, sociopolitical and economic circumstances [30] (p. 218).

Moving away from typological and chronological questions, the application of settlement chamber theory in the microlandscapes of Crete and the analysis of long-term settlement history on the island by Herbert Lehmann [12], where the concept of a single major settlement and its socioeconomic dimensions within a microregion was first introduced and elaborated, comprises a well-known case study. A couple of decades later, Alfred Philippson [13] investigated the physical and historical landscapes of Greece, focussing on microlandscapes and spatial organisation within them. One of the most representative works, however, following the German geographical tradition of settlement chambers in the era of archaeological intensive surveys or ‘new wave surveys’, is by the Boeotia Project in central Greece. Already in the 1990s, Bintliff [29] discussed the case study of the Valley of the Muses in western Boeotia, a fertile settlement chamber surrounded by mountains on three sides, where just a single nucleated community was located between the Bronze Age and the late Ottoman period. The settlement of Askra was located on the valley bottom until the early 13th century AD, when it was transferred 500 metres east under the command of a feudal lord, and then again in the 17th century AD in its present location on the east edge of the valley, following the breaking-up of villages into serf estates due to the Ottoman economic crisis.

It is true that Bintliff’s approach to settlement chamber theory in the case of the Valley of the Muses is essentially more associated with the Czech School of ‘community area’ theory, initiated by Evžen Neustupný [31]. Neustupný suggested that the remains of settlement activities by individual prehistoric communities accumulated within the original ‘settlement areas’ with various functions [32] (pp. 154–155). The principles that make community area different to settlement chamber theory is that the former relies mostly on environmental factors (e.g., land fertility, water sources and natural paths) to define settlement chambers, while the latter includes historical and social variables to define community areas [27] (pp. 7–8). Thus, landscape is not perceived as “a geographical unit, but the relic of a past social world” [32] (pp. 154–155). This spatial and temporal ‘continuity’ in settlements within the same community area (at or beside the occupation of the previous phase, associated with specific environmental qualities and historical variables) does not necessarily denote ethnic or cultural continuity, which may appear or disappear along with material traces of human activity [14] (pp. 144, 146–147), [27] (p. 9). Despite the relocation of settlements from period to period and the interference of settled communities with landscape transformations, we would agree with Kuna and Dreslerová [32] (p. 149) that “all processes in the landscape relate to the state of the previous period and previous generations of its inhabitants—in this sense landscape has a memory” [33].

Boeotia in the postclassical period (after the middle 7th century AD) comprises a representative example of settlement continuity within the same settlement chamber, the role that memory played in terms of how people may have perceived or remembered previously inhabited neighbouring sites and the role that such sites and sights may have played in peoples’ perception of their community area. In the community area of the ancient city of Tanagra in eastern Boeotia, the naturally defended and walled site of Kastri succeeded the late antique city of Tanagra itself (a couple of kilometres to the northeast) after its abandonment in the 7th century AD. In this transitional period, signifying the passing from Antiquity to the Middle Ages, crises, abandonment, colonisation, relocation, defence-works, proximity to the ruins of the Roman past and the memory of Tanagra’s previous status must have played a crucial role in continuities and transformations within the Byzantine settlement system of this microregion [16] (pp. 128–130).

3. Central Place Theory, Settlement Hierarchies and Central Flow Theory

In the context of historical geography and settlement research, Christaller's central place theory remains oriented around (a) the application of economic spatial theory in the sense of least effort for maximising profit [34,35] and (b) the analysis of settlement hierarchy and the structure of settlement patterns [36] (p. 251). All the aforementioned principles are undoubtedly closely interconnected and cannot be ignored in the context of landscape archaeology, where the interaction of human societies with the natural environment (e.g., topography, geology, soils, vegetation and climate), as well as with the cultural/historical context, informs our reconstruction of past societies and the evolution of *Homo economicus* [37] (p. 548). We should note that an overwhelming focus on central place theory itself, without further research into the local context and the overall settlement structure, may lead to viewing every single settlement as a 'central' one, as previously pointed out by Oliver Nakoinz [36] (p. 251). On the other hand, and despite its 'unfashionability' in the course of the 20th century, central place theory was applied in different archaeological case studies since the 1950s, in the context of locational analysis, settlement hierarchy, central place functions, territoriality and liminality [35,38–41]. A noteworthy attempt to integrate centrality analysis and evaluate central place theory in the light of current trends in network theory was undertaken recently by Daniel Knitter and his collaborators [9], while the idea of central flow theory to complement central place theory was initially put forward by Evert Meijers [42] and followed by other scholars [2].

It goes without saying that the principles of distance and cost (in terms of travel time) between a number of retailing and service centres of different sizes in a microenvironment remain of paramount importance within the framework of Christaller's work. Yet, it has to be pointed out that the spatial organisation of any settlement network, site-hierarchy and the concept of centrality are equally important in central place theory and landscape studies to today. Obviously, environmental considerations play a major role in settlement location, site formation and site-hierarchies, although generally neglected by Christaller's economic model [8] (pp. 33–34). As Knitter and Nakoinz [43] unmistakably note in the present volume, there are three types of settlement hierarchies distinguished by Christaller that correspond to different principles: the market principle, the transportation and the administration principle; such parameters result in distinguishing between higher-order and lower-order centres. Thus, by determining the degree of centrality, the hierarchical function of sites and their interrelationship within specific microregions, different correlations can be made as a measure of the emergence of centralised political authority, centre-periphery relations and the identification of depended territories around such higher-order centres [44] (p. 3).

In this context, the work of the historical geographer Ernst Kirsten [38] on the formation of the Greek *polis* and its extensive dependent hinterland had a profound effect on 'new wave surveys' in Greece during the 1970s and the introduction of the technique of 'site catchment analysis' into the archaeological world [45], [46] (pp. 207–209). Borrowed from geography, the method of building 'Thiessen polygons' was employed to represent catchment areas (dominated by different central places) by drawing boundary lines at right angles to give a series of polygons. Thiessen polygons and the concept of 'territoriality' were widely employed and have had a long history in central place theory and its application in archaeology [36] (pp. 252–256) [39]; a typical example is the territorial analysis of *demes* in early classical Attica, with possible agricultural territories at a 2–3 km radius around community centres [30,46,47]. Further historical and archaeological work in the province of Boeotia in central Greece [14,41,46,48] has demonstrated that key cities were located at 14–15 km radius catchment (or a day return) as predicted by rural marketing theory, while lesser communities of village-hamlet size at 3 km radius within a territory of cultivable zones; according to Bintliff [14], some of these lesser communities may have grown into regional central places, or in periods of growth, some village-sites may have reached urban status. Obviously, landownership, the sense of belonging and the aggressive (in cases) absorption of lower-order centres by higher-order ones to gain access to food surpluses and manpower in a period of city-state formation (such as early classical Greece), testifies to the prominence of formal boundaries and the demarcation of space [41] (p. 33).

A similar approach, using Thiessen polygons, has been undertaken in Cypriot archaeology to suggest a hypothetical model for the territorial expansion of Iron Age polities [49]. As noted by Papantoniou and Vionis [22] in the present volume and in different occasions previously [50] (pp. 549–550), the problem of the Thiessen polygons method is that it is operating on a featureless space, not taking into account topographical parameters, archaeological and textual evidence, while the concept of hierarchy or political dominance expressed by territoriality is predetermined, drawing definite spatial and political boundaries. It has to be born in mind that Thiessen polygons used to be a widely employed tool of locational analysis to graphically present site catchment areas in geography and archaeology on a ‘featureless’ space on the basis of Euclidean distance and gravity based rules [27]. Contemporary tools within Geographic Information Systems (GIS), however, such as ‘cost-surface’ and ‘visibility’ analyses, provide alternative methods that take into account the terrain’s topography, time and energy; combined with the study of detailed archaeological datasets and other cognitive landscape parameters, such digital tools are nowadays widely used in spatial analyses in the field of landscape archaeology.

Numerous examples of spatial analysis and site-hierarchy within the catchment area of different central places can be found in the archaeological literature. Late Minoan Knossos, for example, comprised a ‘real’ central place, hierarchically followed by second-rank towns (such as Phaistos, Malia and others) and surrounded by third-rank satellite settlements at regular short distances [51] (p. 63). In Greco-Roman Boeotia, as mentioned above, a network of lesser hamlets, villa estates and isolated farmsteads infilled territories or ‘settlement chambers’ within an organised settlement system that rose and fell period by period, indicating times of prosperity or stability and contraction in terms of population and economy [14] (p. 148). In Roman Spain, the town or *civitas* has been regarded the paradigm of a central place within its respective territory, filled with villas and other (minor) rural/farming establishments, through which the whole economic network was maintained [52] (p. 83). In medieval Britain and Tuscany, the creation of markets, transport networks and administrative authority have been identified as economic and social elements of central places such as towns, which, deprived of their Roman look, may have comprised ‘weak towns’ but still holding juridical and religious functions, a basic street system, a market place and perhaps a specialised industry [53] (pp. 97–100), [54] (p. 6).

But what defines a central place as such and what parameters can one explore so as to assess the hierarchy of sites within a settlement network? It has been argued [9] (p. 47), [55] (p. 1307) that a central place does not always need to be a settlement but can also be perceived as a cluster of institutions that offers goods and services at local or regional level. It is central functions that determine the degree of centrality at a certain location, creating a hierarchy of sites, thus, the more functions gathered at a site, the higher the level of its centrality at local, regional or supra-regional level [9] (p. 47). Knitter and Nakoinz [43] refer to ten functions that define central places, as previously analysed by Dietrich Denecke [56] (p. 43), i.e., political and administrative, legislative, security, cultic and spiritual, cultural, charity, agricultural/economic, craft production, trade, traffic and transport, while they also summarise five main ones, as further assessed by Eike Gringmuth-Dallmer [57] (pp. 9–11), i.e., administration, security, industry, trade and cult.

Communities have always been interrelating with one another in a variety of ways. The degree of importance of different localities and the functional relationship between them renders each of these sites as central (such as towns and/or cities), non-central places (such as hamlets and minor rural establishments) being served by central ones, and other specialised spaces offering goods and/or services for non-local groups [8] (p. 35), [58] (p. 78). It goes without saying that a central place needs to fulfil an administrative role, serving as a focal point when it comes to territorial control, to provide accommodation to a ruling elite (military, religious or civic) whose needs for luxury goods are met by artisanal production, and to prove economic diversification [52] (p. 85), [59] (p. 13). An exemplary attempt to classify different medieval port towns of the 11th–12th and 13th–14th centuries AD in the Peloponnese in order to reconstruct their hierarchy by identifying the degree of their centrality

is undertaken by Katerina Ragkou [60] in this volume. Corinth, for example, which functioned as the administrative seat of the Peloponnese, comprised one of the oldest ecclesiastical metropolises of the region and had invested on artisanal production while maintaining commercial contacts with other Byzantine provinces, thus, it can be identified as a higher-order central place; on the other hand, Modon and Coron on the western tip of the Peloponnese, comprised lower-order centres, since the functions they gathered were confined to safety, religious and commercial services [60].

Looking at the *longue durée* evolution of settlement systems and hierarchies, it is imperative that we stress, as previously pointed out by John Parr and Kenneth Denike [61] (p. 574), that settled landscapes, territorial formations and site hierarchy do not remain static; historical, environmental, societal and other factors can alter the hierarchical order of a network of special locations from period to period. We may repeat here the example of Greco-Roman Boeotia, where lesser hamlet and village communities may have grown into regional central places in times of growth [14], while in the case of the Byzantine Peloponnese, the port town of Glarentza, established in the 13th century AD, rose in political and commercial importance and quickly emerged as the new focus of the region, having succeeded Corinth in the hierarchy of late medieval port centres [60].

As already noted above, central places may also be localities other than settlements, where centrality can be measured not just by the number of goods or services being offered but, additionally, by the degree of interaction, as originally put forward by Meijers [42]. Meijers' 'network model' was consequently elaborated as 'central flow theory' by Taylor, Hoyler and Verbruggen [2], followed by Nakoinz [62] (p. 219), and Knitter and Nakoinz [43] in this volume, who eloquently defined centrality as the "relative concentration of interaction" and the "location of high density of interaction nodes". While central place theory is related to hierarchies, central flow theory is defined as interlocking networks through which two distinct social spaces can be identified: "spaces of places and spaces of flows" [2] (p. 2805) [63]. Instead of two opposing theoretical approaches, central place theory and central flow theory should be regarded as complementary to each other, leading towards the idea of 'network centrality'. As suggested by Knitter and Nakoinz [43], Christaller's centrality model (concerned with node synergies) can be adjusted and combined with social network theory (concerned with edge synergies) to create an integrated and informed approach.

What is important in this case is not so much whether "places make flows" (as in central place theory) or whether "flows make places" (as in central flow theory) [2] (p. 2815). What is important and what makes it a more holistic and updated approach to centrality, is the combination of both frameworks: interactions are directed towards the closest node to minimise transport costs (according to Christaller's economic model of central places), while time interaction costs can be minimised by promoting interactions along network edges (according to network centrality) [43]. It is also important that in the 'network model', urban services are not concentrated in a single centre/city; they are divided between different cities in a way that they complement each other [42] (p. 257). This network between interacting cities creates a web of interlocking first-, second- and third-rank places, all interacting with their surrounding environment, with one another, as well as with sociopolitical units and economies on larger scales [64] (p. 4), [65] (p. 70).

Obviously, places at strategic positions, even at 'liminal' environments, may acquire a higher centrality factor, simply thanks to their degree of 'betweenness'. This is how 'gateways' were eventually integrated in central flow theory and they should be conceived as playing the role of 'local' central places in 'un-central' landscapes. Gateways occupied liminal positions and emerged at the margins of regions, close to production zones (agricultural or artisanal), at the edge of their tributary areas and along natural passes, gathered products from surrounding settlements, redistributed goods to external or regional trade and functioned as focal points at the intersection between their surrounding region and larger economic networks [7] (p. 13), [66] (p. 4), [67] (pp. 89–90). There are numerous examples one can bring to the fore from across chronological and geographical boundaries. Permanent trading places or *emporía*, for example, were established in early Viking Scandinavia for the promotion of specialised crafts, playing a significant role in long-distance traffic as 'nodal points' [68] (p. 126).

In 7th–9th century AD England, some of the major ports-of-trade (the so-called *wics* or *emporia*), such as Ipswich and other riverine or coastal sites, have been seen as localities with emerging political, economic and ideological central place functions and links with the Anglo-Saxon kingship. Although such places have been characterised as ‘urban’ or ‘proto-urban’, due to evidence for direct exchange contacts with Europe, controlled by and directed towards the elites, they seem to have formed spaces in a non-urban settlement system on the edge of their tributary areas, in which central place functions may have been dispersed between a variety of sites [15] (pp. 312–315). In late antique and early medieval Boeotia in central Greece, ports-of-trade (or *emporia*), such as Delion and Anthedon on the Euboean Gulf, played a major role during the era of urban transformations in the 7th and 8th centuries AD. Both of them comprised seafront sites with a considerable extent of fertile land and a good harbour (where goods were collected, loaded and shipped to various destinations), they were associated with a settlement (having a local market and a Christian basilica), and provided extended marginal/agricultural territories with access to a wide economic exchange network [16] (pp. 144–146) [69].

There are recognisable differences between central places and gateway-sites: central places are located within homogenous production regions and usually have local trading connections; gateways, on the other hand, are located between different homogenous regions and at the edge of their tributary territories, starring in long-distance trade connections and controlling transportation axes of goods and people [7] (p. 13), [70] (pp. 269–270). As Andrew Burghardt has noted in the past, a central place has a regular, circular or hexagonal service area, resembling “the centre of a bowl”, whereas a gateway has an elongated service area, similar to “a funnel or spout” [70] (p. 270). Thus, even small remote places, such as Lapithos on the northern coast of Cyprus in the Middle Bronze Age, as persuasively argued by Jennifer Webb [71] in this volume, with small but suitable harbours and territorial control over natural communication passes (i.e., the Agirdha and Panagra Passes), were involved in supra-regional interactions as local interaction nodes and points of convergence for commodity flows. This high density of network exchange and interaction equipped such localities with a high degree of network centrality.

Taking the *limes* and the perception of frontiers in the West Roman Empire as an extreme case study example, it is clear that, as Hans-Werner Goetz [72] (pp. 73–74) argues, there was no definite borderline or cultural frontier; rather than hindering, they supported trade and interaction and “dissolved into enclaves of rulers who were heirs of Roman culture”. Along the same line, it has been argued that centrality and liminality are interrelated notions and part of the same structure, since “the most conspicuous part of the centre was the area where it met the periphery” [73] (p. 91). Although the sense of belonging and the formal demarcation of space have been fundamental in centrality theory, as we discussed above, it should also be noted that boundaries sometimes remained notional and fluid, endorsed with legends of heroes or stories of horror. A sense of notional liminality or frontier has been noted in the case of the extra-urban sanctuary sites of Myrtou-Pigadhes and Agia Irini close to the north coast of Cyprus, the former at the entrance of the Panagra Pass and the latter at the edge of the fertile Morphou plain, as analysed by Giorgos Papantoniou and Giorgos Bourogiannis [74] in this volume. As also discussed elsewhere by Papantoniou [23,50,75], extra-urban sanctuaries were located in frontier/liminal zones and served as both contact and confrontation points between the different Iron Age polities of Cyprus, rather than as merely points of symbolic territorial demarcation and definition. Similar conclusions have been drawn in the case of the Etruscan city of Populonia in the early Iron Age by Giorgia Di Paola [76] in this volume, who sees liminality in the context of Populonia’s territory not so much as a ‘marginal’ environment associated with wilderness but as a landscape acquiring new connectivity trajectories through the foundation of hilltop fortresses within a hierarchical settlement network. Jody Gordon [77], following a centrality approach in this volume, investigates how the two major ports of Cyprus, Salamis and Nea Paphos were marked by their liminality and served as gateways that connected their terrestrial hinterlands to international maritime networks, functioned as central places and fostered novel economic and cultural exchanges. Yet, apart

from the location or the number and type of services offered, favourable environmental characteristics played a decisive role in the centrality of a place. Gregory Utz [78] in this volume applies successfully the concept of gateways and centrality in a similar methodological framework, using the main port cities of Marseille and Arles as case studies to illustrate how the natural environment and political control made an effect on the economic development of both cities in Greco-Roman times.

4. Settlement Ecosystems and Land-Use

Having referred to settlement hierarchy, we should note that it is around these main settlements or central places that rural communities in un-central landscapes are organised (always in relation to nearby resources) and it is through central places that rural communities interact with economies on larger scales. It is true that neo-Malthusian population cycles, demographic pressure and the straining of natural resources have long dominated settlement archaeology and economic studies of the pre-modern periods [79–81]. Although such explanations once became unfashionable, with archaeological theory downplaying the role of the physical environment, one cannot underestimate the effect of human interference with the natural environment and its resources [82] (p. 36), [83] (p. 2). Environmental determinism still offers a valid explanatory framework to crisis and resilience for specific parts of the globe [83] (pp. 7–10), such as the drought and famines, accompanied by cold weather conditions, recorded for the period from the later 6th into the 8th centuries AD in the Levant and Asia Minor [84] (pp. 126, 138).

The terms ‘physical environment’, ‘ecosystem’ and ‘landscape’ are often confused and/or interrelated. By investigating concepts of centrality (and marginality/liminality) within settlement systems in the framework of Siedlungsarchäologie (or settlement archaeology) of the German culture-historical and geographical traditions [32] (p. 147) [85], it is anticipated that the natural environment remains of paramount importance in understanding the establishment of central places and in identifying their spatial relationship with satellite establishments and their immediate territories. After all, landscape archaeology has always been defined as the archaeological study of the interaction between humans and land within their environmental context [86] (p. 1), [87] (p. 5). It is this past interaction between humans and the natural environment that has recently come to the fore as a more systematic and holistic approach to the relationship between societies and nature, and it is this meaningful relationship that is embedded in the term ‘landscapes’. Landscape ecology or landscape ecosystems have gradually penetrated the field of landscape archaeology and history; both terms define a heterogeneous area composed of a cluster of repeated ecosystem types, interacting with each other across space and time [87] (p. 5), [88] (pp. 11–13).

Settlement ecology, on the other hand, “emphasises natural environmental variables, including essential subsistence resources, other raw materials needed for physical comfort and health, and items for trade or exchange” [89] (p. 177). It also examines the central issue of dynamic risk management through a community’s deployment of its economic and social technologies. Recent studies have illustrated how the natural environment has influenced or even determined the formation, development and decline of central places, and whether landscape and environmental variables have shaped the relationship between a central place and its hinterland [9]. The decline of Ephesus/Selçuk, for example, has been associated with the silting of its harbour, which eliminated the advantages of the city’s dynamic economic agents and consequently its centrality deteriorated [9] (p. 53). Similarly, at the end of the Late Bronze Age in Cyprus, river silt and coastal changes had made it imperative for Enkomi (Old Salamis) to move and to establish a new harbour at (Nea) Salamis, on the east coast of the island, gradually losing its centrality and transferring to an emerging location nearby [90] (p. 31).

Contemporary landscape archaeology, however, does not deal with the analysis of individual ‘sites’ as such, but, rather, it comprises a multiscale and overarching approach to the study of entire ‘microregions’ or ‘microenvironments’, containing mountains and plains, coasts, ports, rivers and springs. This is also how the term ‘landscape’ has been perceived in the framework of the German school of landscape archaeology or Landschaftsarchäologie since the 1990s [32] (p. 150) [91,92] and

how it has been practised in Europe with a long tradition in landscape archaeology and archaeological survey in the quest for the landscapes of Classical Antiquity [93] (p. 318). Indeed, as has been concisely summarised elsewhere [32] (p. 150) [94,95], landscape archaeology encompasses the identification and analysis of settlement densities and the spatial organisation of settled communities (above the level of individual sites or communities), the hierarchy of settlement (or other) sites, demographic trends, primary production and the distribution of raw materials.

We do not wish to argue here that a landscapes approach to settled communities, their spatial distribution or their hierarchical relationship in their environmental context solely denotes ecological or geographical determinism (e.g., distance from a water source, travel time to a community's most remote agricultural land, etc.). Three basic strands of research (such as those posed by the Kiel Graduate School "Human Development in Landscapes"), however, successfully encapsulate the long-term relationship between humans and the natural environment: (a) the way past human societies conceived their natural and cultural environments, (b) the way social space adjusted to changing environmental conditions and (c) the way demographic trends and technological change influenced social groups and landscapes [96] (p. 40). Subsistence and surplus production, distribution and consumption, demographic growth and contraction, population density, carrying capacity, ecological change and climatic and environmental conditions [96] (pp. 40–42) [97] have always comprised crucial elements of investigation in terms of centrality/liminality, economy and society in the framework of landscape archaeology. As shown by Papantoniou and Vionis [22] in this volume in the case of the Xeros River valley in Late Antiquity, the largest settlement of the valley—an 'agro-town' of 13 ha in size with an estimated population of 250 families—played a central role within its catchment area or 'settlement chamber'; it was located at the approximate centre of the region, it had easy access to fresh water sources (the Xeros River) and enough cultivable land to sustain the population of the valley, as well as overwhelming evidence for storage and transport at the central site and for the production of ceramic domestic wares within its catchment area. In a different context, Natalia Poulou and Anastasios Tantsis [98] in this volume argue that the location of bath-houses in eastern Crete in Middle Byzantine times was obviously determined by immediate access to fresh water (e.g., close to ravines), yet, their very existence usually denotes (along with other archaeological, toponymical and textual evidence, if available) their attachment to a nearby settlement of some status in the 8th–12th centuries AD, that being a bishopric, a town or an important rural settlement with certain amenities, playing the role of a local central place. Along the same line of investigation, Lina Diers [99] in this volume uses the exceptional case study of the Roman mining settlement of Timacum Minus in upper Moesia to illustrate how historical realities, the landscape of the Timok valley and the locality of the site played a major role in formulating its 'centrality'.

As already noted above, certain theoretical approaches in landscape archaeology, such as phenomenology, pioneered by Christopher Tilley [25], have been prioritising human experience or intentionality, and have been reluctant in engaging with certain environmental sciences, such as palaeoecology and geoarchaeology [25], [37] (pp. 547–548), [82] (pp. 39–40). However, our ability to reconstruct past landscapes in an efficient and holistic manner requires a more effective collaboration between archaeologists, historians, environmental scientists and theorists [100]: a collaborative and flexible approach that would integrate different types of environmental data and human experience across temporal and spatial scales so as to avoid an artificial separation between environment and culture [37,87]. Rather than separating between the two or denying 'objects' or 'subjects', it would be more enlightening if we examined the dynamic interaction between human and non-human agents and the relative distinction between marginality and centrality [37,101]; central place theory, central flow theory and settlement chamber theory, when applied more flexibly, cannot but be modified to encompass the required balance between the human factor, the natural and cultural environment.

Christy Constantakopoulou [102] offers in this volume a fascinating view of the concept of marginality in the archaic and classical landscapes of Greece, where hunting in uncultivated un-central landscapes, the *eschatía*, comprised a widespread practice and a rite of passage for the young

(amongst the elites), while the hunting ground itself, on the edge of cultivated land, not only allowed access to the market (where game was sold) but also underpinned the complex interplay between humans, animals, economic practices, elite ideologies and the natural environment. It is also in this context that Anna-Katharina Rieger [103] in the present volume examines two arid, un-central and supposedly marginal regions in Greco-Roman Syria and Egypt to understand settlement patterns and economic practices, successfully providing a showcase of resource management (i.e., water) and social organisation. On the other hand, Louise Steel [104] in this volume examines how water shaped people's interaction with the landscape in Bronze Age Cyprus and moves away from 'traditional' approaches to landscape archaeology by emphasising the agency of water and how this shaped people's movement through their landscape.

Digital analytical approaches, such as GIS, currently provide efficient tools for managing a large and varied databank in order to explore environmental sustainability and its effect on human societies with the aid of archaeological and literary sources (when available), anthropological and paleoenvironmental data, historical maps and digital cartography [105]. This combination of tools and data can prove an invaluable and robust means for the evaluation of central places and their peripheries in their landscape setting. Approaches of this kind, with a strong focus on 'village ecosystems' and a solid theoretical background have been employed on several occasions in the framework of a developed and updated version of settlement archaeology or Siedlungsarchäologie in Germany (with a slight delay in comparison with Britain) to investigate human agency and cultural change [91,92,106,107]: On the basis of historical and ethnographic data, Rainer Schreg [108] (pp. 95–98) summarises three main types of economic systems, previously investigated in the framework of a study on Neolithic cattle husbandry [109], in order to provide a model for the evaluation of economic dynamics of settlements and their associated territories: (a) the 'closed system', associated with a small territory suited for agriculture and an amount of 0.39 ha of farmland available for each person to cultivate; (b) the 'maximum system', with an economy mainly based on livestock and enough land but only part of it potentially arable, with an average of 0.15 ha of land per person to cultivate; and (c) the 'open system', where the amount of land is not limited and village territories can be up to several days walking distance. As Schreg [108] (p. 97) notes himself, the proposed models cannot possibly cover all kinds of village ecosystems there may have existed through time, considering that settled landscapes included also towns, castles and monasteries. The models do provide, however, a convenient means through which one can examine settlement dynamics and demographic trends, carrying capacity, territoriality and settlement hierarchy.

5. Sacred Landscapes

The turnaround of politicoeconomic factors (as we discuss below) and the manifestation of the 'sacred' seem to have played a pivotal role in the expression of power and ideology, shaping settled and sacred landscapes accordingly, as well as determining settlement recovery and resettlement of abandoned or semi-abandoned microregions. Landscape studies have evolved into a significant branch of historical archaeological research in the last four decades, by placing emphasis on the ecological, economic, political and cultural values of pre-modern landscapes. Ever since spatial analysis entered the field of New Archaeology, archaeologists, historians, anthropologists and geographers—working together—have been trying to explain, for example, how and why complex settlement systems developed in the landscape [35,110–112].

Even more interestingly, the study of 'sacred' landscapes has by now become another prominent field of landscape research, mainly in Northwest Europe and North America, by paying attention to the ideational dimensions of sacred mountains and hills, burial monuments and grave markers, sanctuaries, temples and churches [113–115]. As we have explained elsewhere [20], the term 'sacred landscapes' has been chosen in acknowledgement of the inspiration provided by the published work of Susan Alcock [116–118]. By using this term in her examination of the Hellenistic and Roman sacred landscapes of the Greek world, Alcock shows that the relationship between religion, politics,

identity and memory was more intimate and more involved than has often been assumed [118–120]. She regards sacred landscapes emerging:

“... as both culturally constructed and historically sensitive, immensely variable through time and space. Far from being immune to developments in other aspects of human life, they can reflect a very wide cultural and political milieu. Yet they also provide more than a simple mirror of change by their active participation in the conditions of social reproduction” [116] (p. 172).

The investigation of ‘ideational’ or ‘associative’ landscapes, where people associate features in the natural and built landscapes with their own memories, meanings or emotions [118,121], is particularly relevant to sacred landscapes and political economies [122] (p. 18). ‘Ideational’, as Bernard Knapp and Wendy Ashmore [121] argue, is far less linked to an articulated system than the terms ‘ideology’ or ‘ideological’; therefore, it can also be used to embrace sacred as well as other kinds of meanings attached to and embodied in landscapes.

The concept of memory is crucial in the process of socialising landscape and naturalising cultural features in the land. It is created by the repeated movement of the body throughout the landscape. Barbara Bender [123] (p. 3) regards landscape as a process that is “intensely political, a way of perceiving, experiencing, and remembering the world” [124] (p. 240); landscapes not only shape but are shaped by human experience [123]. As we have noted above, Tilley’s [25] influential study is concerned explicitly with phenomenology of landscape as an experience. The experience is synesthetic, “both creating and engaging a narrative linking the body—individual and social group—with the land” [124] (p. 261). The movement of the body through space is crucial as it provides people with a particular way of viewing the world, it has important implications for the maintenance of power relations [25] (pp. 27–33), [125] (p. 47). By controlling the way people move through space, it is possible to reproduce dominant perspectives on the world [25] (p. 204). Robert Johnston [126] (p. 56) sees landscape as existing through two different understandings of ‘perception’: in the first, perception acts as a filter on the real world; in the second, it is a process through which people understand the world. In studying landscapes, perception cannot be ignored and it should be acknowledged that perception is not beyond archaeological analysis [127] (p. 221).

Questions about ascribing meaning to landscapes and issues of social mechanisms by which meaning is attached, as well as the range of meanings that can be encompassed should be raised [124] (pp. 263–265). Meaning is usually attached through memory and ritual. However, memories and meanings are created afresh from generation to generation and differ between individuals. As Ashmore [124] (p. 264) notes, “prominent among the meanings of landscape are power and identity, variously defined and expressed in sundry forms”. As landscape delineates memory and declares identity, the land itself plays a fundamental role in the social and cultural order and in human relations. Further, “as a community merges with its habitus through the actions and activities of its members, the landscape may become a key reference point for expressions of individual as well as group identity” [121] (p. 16). The transformation of landscapes has been associated with the transformation of the social order, coming from short-term events (sociopolitical time) or medium-term cycles (socioeconomic time). As Knapp and Ashmore [121] (p. 18) note, since landscapes embody multiple times as well as multiple places, they consequently materialise not only continuity but also change and transformation. Landscapes are perpetually under construction, which is why an enduring theme in recent archaeological thought has been the ‘reading’ of social power, which includes political economies, from those modified landscapes [128] (p. 271). John Cherry [129] (p. 33) emphasised the need to bring into a closer dialogue the various approaches of landscape archaeology. Survey reports should be combined with excavation reports, political histories (which we would modify to ‘political economies’), and notions of recent “archaeologies of landscape” [121]. Emphasis should be given to “the process of reinterpretation and reworking of dynamic landscapes whose changing appearance communicates cultural values and is charged with meaning” [129] (pp. 32–33).

When it comes to the Christian landscapes of the Mediterranean, for example, monumental/urban and humble/rural churches comprise the most obvious way that the sacred is manifested, exerting an influence over social and cultural experience [130] (p. 42). A number of relatively recent publications have focussed on early Christian monumental basilica churches of the 5th and 6th centuries AD as powerful expressions of Christian ideology in the process of Christianising the late antique landscapes of the Eastern Mediterranean [21,131,132]. The prominent siting of Christian basilicas, chapels and monasteries in Late Antiquity was intended to dominate the religious skyline of cities and their immediate countryside, in the same way that pagan sanctuaries on mountain tops and other prominent sites had done in the past [16,133]. On the other hand, there are diverse ways one can interpret the distribution of early Christian churches, such as the spread of Christianity, pilgrimage and trade and network connections.

A church is not simply a 'sacred space' or a symbolic expression of Christian piety. Depending on their contexts, churches functioned in a variety of ways: as monastic churches, episcopal and 'parish' churches, cemetery churches, private and burial chapels [134] (pp. 93–96), [135] (p. 79), [136]. Their architectural, decorative, archaeological and topographical parameters need to be taken into account in order to contextualise their meaning, ideational or other, and comprehend whether one can distinguish between 'sacred' and 'profane' or how 'profane' space was converted into a 'sacred' one in the landscape. Additionally, senses such as the view of painted icons, the hearing of processional prayers, the movement of sound or the smell of incense and other sensory experiences (e.g., the *proskynesis*, i.e., touching and kissing icons) cannot be ignored in a holistic approach to Byzantine sacred space [137] (pp. 32–33), [138] (p. 406), [139] (p. 76), [140] (p. 322).

As noted above, churches also functioned in a variety of ways, thus, one can explore their particular location and meaning in the landscape through various means. Sharon Gerstel has previously suggested that churches dedicated to Saints and the Virgin were constructed in towns and villages, functioned as 'parish' churches and were perceived as the spiritual, architectural and social centre of settlement communities [141] (p. 166), [142] (p. 338). In a different topographical setting, Veronica Kalas [135] (p. 90) has seen outlying chapels in 10th–11th century Cappadocia as a protective sacred barrier between the outside and inside worlds of the inhabitants. Churches of the period of Latin domination in the 13th–15th centuries AD, located in close proximity to arable fields belonging to small landowners, have also been seen as markers of important resources and property ownership or as entry points to geographical units, like the cases discussed by Lucia Nixon [143] (pp. 23–26) in Crete, or Jim Crow and his collaborators [144] (pp. 130–132) in Naxos.

Nowadays, various GIS analyses (e.g., Viewshed, Cost-Surface and Least Cost Path) comprise a useful means for exploring the spatiality of sites (i.e., the hierarchical arrangement of sites) and their relation with topography and the environment, social and economic variables. The relationship between extra-urban sacred space and the formation of political and cultural identities was recently examined in the context of Iron Age Cyprus by employing a series of GIS analyses [50] (p. 542). An equivalent approach was followed for the first time in the case of the sacred landscapes of late antique Naxos [21] (pp. 265–271). Viewshed and Cost Surface analyses from several late antique basilicas on Naxos have demonstrated that churches functioned as settlement focal points, as economic 'central places' and as notional territory or 'boundary' markers. Site choice, the spatial distribution and the secular dimension of Byzantine churches have also been observed in the case of the region of Tanagra in Boeotia (central Greece). GIS analyses, in combination with archaeological evidence for settlement activity in the area, have revealed the pattern of settlement hierarchy and how village-community 'territorial boundaries' were formed under the protection of the 'sacred' [16] (pp. 166–168). Another fascinating example of sacred or ritual landscapes and centrality is provided by Hamish Forbes [145] (p. 372) for the Methana peninsula in the Peloponnese. There, extramural churches in faraway locations and on 'neutral' ground formed strategic meeting places for family and friends from different villages. The annual celebrations at those churches provided the means by which different communities have been able to express their pan-peninsular identity. In this landscape,

therefore, it was not nucleated communities which have become 'central places'; rather, it was these isolated structures in the apparently 'empty' countryside.

The study of central and un-central landscapes, therefore, within the above framework, may become a significant interlocutor, which stimulates the understanding of the broader political, economic and cultural space. Landscape archaeology has the potential to be truly unifying, bridging the gap between scientific or positivistic archaeologies and those that approach it from the perspective of social theory or the humanities [146]. There is undoubtedly a need for an integrated approach in which all the approaches mentioned above are taken into account.

6. Political Economy

It is commonplace that Adam Smith is generally regarded as a 'neoclassical economist', the founder of 'political economy' as a distinct social science and a representative of 'liberal capitalism' through his influential work *The Wealth of Nations* [147], originally published in 1776. Amongst other contributions, his work defined better than any time before the role of the state in economy. The concept has been adopted in humanities and used more broadly by anthropological archaeologists [17] (with references). In addition, Smith's writings have recently generated great interest amongst scholars (ancient historians and classical archaeologists amongst others) in pursuing a more holistic approach to analysing his thought [148] (p. 1). In short, Smith's approach, at the beginning of the Industrial Revolution, provides the earliest comprehensive account of market society as a decentralised, well-governed system in which prices coordinate the efficient allocation of resources in a competitive economy. He distinguishes four substantive terms: the *nature* and *causes* of the *wealth of nations*, while he defines 'political economy' as the medium (a) for the provision of plentiful subsistence for the people and (b) for the supply of the state with a revenue sufficient for public services [148] (pp. 10, 30). His multifaceted monumental work comprises an exceptional account, employing terminology such as productivity, the division of labour, the concepts of price, profits, wages, money and free market (aspects of economic analysis), as well as aspects of specialisation and demand in Europe since the fall of the Roman Empire [149]. Today, Smith is still viewed as a crucial thinker in the field of economics.

The concept of 'political economy', however, has been used more broadly (in an attempt to interpret economic life well before the time of Adam Smith) in the writings of ancient philosophers, such as Xenophon, Plato and Aristotle, who represent the first attempts for understanding economy in ancient Greece [150] (pp. 100–101). The 'laws of state management', as we would literally translate 'political economy' from Greek, first introduced as a term by Antoine de Montchrestien in 1615, defined the means to increase a state's wealth and run its economy. Political economy became the focus of the work of Karl Marx [151] which defined the means of controlling wealth and creating inequality [152] (p. 204). It was within the work of both Marx and Engels that political economy acquired a 'proletarian' value and was defined in terms of labour and exchange relationships to elucidate the role of the state in protecting (and helping to grow) the wealth of the bourgeoisie [150] (pp. 105–108), [152] (p. 204), [153].

When it comes to the application of political economy in archaeology and anthropology, the concept varies accordingly. As Kenneth Hirth [152] (p. 205) points out, anthropological and archaeological analyses focus on the production and exchange of goods, on the function of service centres in both state and non-state societies, emphasising interregional linkages within and between prehistoric and historic societies [154] (p. 43). 'Political economy' is contrasted to 'subsistence economy', with the former defining the satisfaction of basic everyday household needs (e.g., food, shelter and clothing) and the latter seeking to generate income for a ruling elite, agreeing—in a way—with the Aristotle's analogy of household economy being in a family, while political economy being in a state [155] (pp. 481–483). Thus, political economy mobilises (or extracts) a surplus from subsistence economy to sustain political, religious and social institutions constituted by a non-food producing group, i.e., the 'elite' [156] (p. 13). As a result, the ruling elite administered such institutions in order to own and control productive resources.

As anthropology and archaeology grew in the course of the 20th, with Marxist concepts reviving during the 1960s, 1970s and 1980s, the concept of political economy dominated prehistoric archaeology and cultural materialism [155,157]. Inspired by anthropological political economy in the work of North American anthropologists, Marxist archaeologists discarded basic ideals of Marxist thought by studying such concepts as different facets of the same societal whole [158,159], [160] (p. 133), [161] (pp. 30–31). Contemporary scholarship, however, have questioned in different occasions what role political theory plays in the concept of economic and political life; it seems that both concepts are interdependent [162] (p. 61).

More recently, anthropological archaeologists, with Timothy Earle as a pioneer, have mostly used the concept of ‘political economy’ to distinguish from ‘subsistence’, ‘social’ and ‘ritual’ economies. Political economy, as Earle [17] (p. 13) discusses, “fuels power dynamics in human societies” and “mobilises resources and labour to support frameworks of power, competition, and potential domination”. According to Earle, centralised institutions of control and governance depend systematically on channelled material flows, and, we would, add symbols, iconography and ideology, that can be read in ancient landscapes. The mobilisation of resources, material and iconography can support the economic, military and ideological sources of power [163,164]. Thus, positions of political authority yield many personal benefits in lifestyle, access to mates or personal standing in the community. Because of these advantages, competition for these positions is strong, and success in competition depends on an ability to maximise power to fend off opponents. It is within this framework of power relations and economic interaction in a supra-regional rather than local level that the exchange and cooperation between places led to the theory of ‘central flows’ discussed in above. As already explained, central flow theory refers to city networks that are constituted by the interlocking of cities via specialists in the course of their economic activities: “vibrant, dynamic cities have always been interlocked by ‘foreign’ commerce, and this has been what has made them cosmopolitan” [2] (p. 2814). Rethinking and reevaluating centrality in light of contemporary developments in archaeological thought, and by bringing together ‘central places’ and ‘un-central landscapes’, help us grasp upon the complex relation between ‘vibrant cities’ and their countryside, as shaped by political economies. The diversity of the different disciplinary perspectives and approaches presented in this volume, combined with dialogues, enriches our task of multiple interpretations, and should be seen as a healthy pluralism.

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Article

The Relative Concentration of Interaction—A Proposal for an Integrated Understanding of Centrality and Central Places

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Abstract: The importance of a place can be assessed via an analysis of its centrality. However, although central place research has a long history, there is no generally accepted theoretical base, leading to continuous debates about the core elements of centrality and those features that ultimately constitute the centrality of a place. We propose a generalized definition that understands centrality as the relative concentration of interaction. Using this definition, we are able to integrate various social, cultural, and natural aspects in the analysis of a central place and its landscape setting. We present a semi-quantitative method to assess the actual and potential centrality and that enables us (a) to draw conclusions about the type and characteristics of central places, (b) to investigate their development throughout time, and (c) to compare them to each other. We sketch the application of the method using two exemplary sites: the Iron Age site Heuneburg and the Roman palace Felix Romuliana

Keywords: central place; social networks; landscape archaeology; settlement location; interaction

1. Introduction

Archaeological research shows that societies are in continuous growth or decline. The focal points and stage of these dynamics have mostly been large settlements and cities. The concentration of people at certain locations constitutes the nodes for structurally coupled networks of human–landscape as well as human–human interactions. Such complex networks of various interrelated factors, ranging from ordinary production up to state-wide politics is revealed when we try to understand the history of individual places. Since the adaptation of the theory from Christaller [1], we refer to these places as *central places*. However, since the beginning of investigations on central places and centrality, there is no common definition or frame and no agreed upon criteria of what makes a place a central place. This theoretical and methodological ambiguity mirrors the great amount of factors and parameters that are worth considering in the study of places. Furthermore, the difficulties of measuring centrality also affect the definition of centrality. It follows that an investigation of central places necessitates concurrently studying its environs, its landscape context, its socio-cultural relatedness, and its history [2].

Despite this conceptual heterogeneity, we have certain *topoi* about the characteristics and localization of central places. Of particular interest in this regard is the study of marginal habitats or “un-central” landscapes [3] that offers a great deal of understanding about the vigor and spirit of past societies and cultures. What makes such landscapes marginal or “un-central” is our surprise about the fact that seemingly insensible decisions still led to the development of sometimes extraordinary

central places, such as Petra [4]. It is these “un-central” places that offer the highest potential for deep insights into our own nature, since they have the potential to uncover what we are not able to ask for or think of. Nakoinz [2] collected different examples of such central places in “un-central” landscapes and integrates them into a joined explanatory framework.

Based upon Nakoinz [2], we propose a conceptual rethinking of centrality and present a methodological tool that can be used to study central places and help to communicate whether, why, or to what degree their landscape setting can be seen as “un-central”. Based on a short historical outline of central place theory and network ideas, we discuss how to deal with incomplete archaeological data in order to analyze the centrality of a place. Based on a sketch of two exemplary case studies, we show that a shared methodology allows a comparison of central places that would normally be incommensurable. If developed further, such comparative approaches offer detailed insights into the nature of our own scientific terms and their high level of implicitness in specific research traditions.

2. Central Place Theory

Central place theory was developed by Christaller [1] to understand the laws and principles that determine the number, size, and distribution of towns ([5], foreword). Although there were earlier attempts that aim to describe these aspects (see, e.g., Kohl [6] or Reynaud [7]), it was Christaller’s achievement to present a first formalization. For Christaller, it does not seem to be possible to understand the amount, distribution, or size of a city based on its natural location ([5], p. 13). Furthermore, he thought that it is not possible to derive the ordering principles of cities based on historical studies or statistical analyses alone ([5], p. 13). Such questions can only be answered based on a deductive, economic-geographical theory ([5], pp. 14, 16). Hence, he developed an economy-centered spatial-equilibrium theory to predict an optimal pattern of cities. After its introduction, the theory was optimized and modified to fit better to certain situations, e.g., economy as mirrored in the work of Lösch [8] or Lösch [9] as well as contexts, e.g., Hudson [10], von Böventer [11], Parr [12], Parr [13], Parr [14], or Arlinghaus [15]. However, since Christaller’s version gives the original idea and the most general picture, we use it here.

Referring to (Gradmann [16], p. 427), Christaller states that the main purpose of a town is to be the center of an area ([5], p. 23). This center has a surplus of meaning because it provides goods and services to its hinterland, i.e., its complementary region ([5], pp. 28–30). These goods and services are called central functions. *Centrality* is the relative degree to which a place serves its complementary region with these central functions ([5], pp. 27, 28). Relative refers to a surplus of meaning above the level that would be expected with regard to the population density.

Christaller’s theory is based upon different assumptions (summarized after Ref. [17], p. 125): the region is an unbounded, uniform, isotropic plain with a proportionality of transport costs and distance. People are evenly distributed and considered equal in terms of income and demand. They are *homo oeconomici*: as consumers, they visit the nearest place to minimize distance; as suppliers, they aim to maximize their profits and will locate as far away as possible from one another to maximize their market areas. Several central places occupy the region and provide their complementary regions with central functions. In the end, these assumptions lead to a hexagonal pattern of market areas ([5], pp. 65–72; Figure 1).

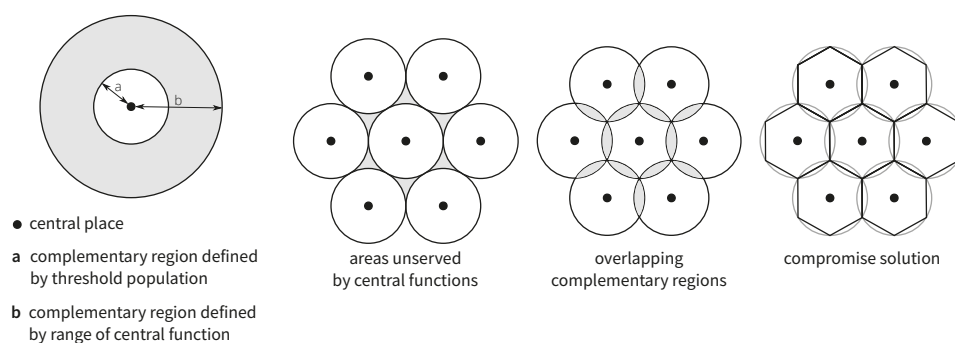


Figure 1. Each offered central function has an upper limit (determined by the maximum distance people will travel to access it) and lower limit (determined by the minimum population required to sustain a central function). Based on this, each central place has a circular complementary region. In this configuration, some areas are served by more than one central place while other areas are not served at all. A hexagonal configuration of complementary regions is the most efficient way to ensure that everybody has access to the central function (after Ref. [5], pp. 65–72).

Central places that offer a variety of central functions are called higher-order centers; places that provide fewer functions are lower-order centers ([5], p. 26). Higher-order centers offer all the functions that are provided by lower-order centers and they provide specific functions that are not offered by lower-order centers. In combination with the upper and lower limits of central functions, this leads to a hierarchical organization of space, with centers that dominate their complementary region in nested hexagons ([18], p. 188). Three types of settlement hierarchies were distinguished by Christaller [5] that correspond to different principles:

- market principle: maximizing the number of centers for the best supply ([5], pp. 77–79),
- transportation principle: reducing the transport distance of centers ([5], pp. 79–81),
- administration principle: no competition between centers by including all lower order centers in the market area of the higher order center ([5], pp. 82, 83).

Based on the integration of central place theory and its empirical affirmation, law-like statements of the distribution of central places can be derived ([5], p. 252): the market principle, i.e., the distribution of central places in a way that seeks a most cost efficient supply, is most common in not densely settled, agricultural areas ([5], p. 252). By contrast, the traffic principle, i.e., the distribution of central places along a line from one central place of the specific hierarchical level to another is most common in well crossable areas. Furthermore, orographic obstacles may force the places to arrange in a layout that corresponds to this principle ([5], p. 252). In the latter case, Christaller [5] calls this a *pseudo-traffic principle* because the locations were determined by the natural characteristics and not by the advantages of a traffic-oriented layout ([5], p. 253). The traffic principle is common in areas where supra-regional exchange is of prime importance ([5], p. 253). A distribution that follows the administration principle is most difficult to detect and might only be possible by historical studies. Only the presence of two central places of lower-order at the theoretical position of a higher-order central place might give hints for the presence of this configuration ([5], p. 254).

Based on the analysis of his study area in southern Germany, Christaller [5] concludes that the market principle is the main law of settlement distribution. The traffic and the administrative principle are secondary deviations that are only present under specific conditions ([5], pp. 254–259). However, subsequent studies showed that neither in contemporary nor in archaeological contexts is one distinct principle present; it is mostly a complex combination of these three principles (e.g., [19], p. 171).

3. A Generalized Definition of Centrality

The short outline of Christaller's theory does not cover all aspects of his work but is sufficient to show some points that allow a modification of his approach. In particular, we need to overcome two important restrictions: the economy-based definition and the focus on Christaller's models. A definition based on *interaction* and an integration of centrality concepts from network theory provide us with a generalized approach and avoids the restrictions as resulting from Christaller's simplifying assumptions. We present (a) different dimensions of centrality, (b) conceptual ideas on potential as well as actual centrality, and (c) a semi-quantitative and easy to use method to complement our modified/extended definition of centrality that results from recent work [2,20,21]. With an integrative approach that is based on *interaction*, we follow a philosophy that is different from those usually published that are characterized by an alternating usage of the term, modifications of central place approaches, and on rejection and avoidance (for a general overview and corresponding references, see [22,23]). These waves of the centrality discourse ignore the fact that, although the centrality approaches do have their limitations, they are still useful for certain purposes. The continuous debate on and application of centrality ideas, which are expanded by the contribution from various disciplines, indicates that a persistent core of centrality approaches exists and that centrality has become a permanent part of the interdisciplinary discourse (more on the history of research in: Ref. [23,24]). With the integrative approach, we aim to synthesize the approaches previously understood as competing paradigms into one consistent concept.

A severe limitation of Christaller's approach is its restriction to economy, although he also includes non-economic parameters and hence has a general concept in mind ([5], foreword). The use of the term *central* in social contexts makes clear that this restriction is inappropriate and hinders an understanding of the concept of centrality. It is necessary to replace Christaller's central functions with more abstract ones that cover non-economical aspects. We utilize the term and idea of *interaction* that provides a sufficiently abstract concept for such a replacement [25]. Since each central function represents specific interactions between two interacting partners, i.e., two interacting places, we can use interaction as a generalizing concept. This leads us to our generalized definition of centrality:

Centrality is the relative concentration of interaction

A central place possesses a higher degree of interaction when it provides more central functions to its complementary region than would be expected by its size. Furthermore, we are now able to define central elements also in social, cultural, and other non-economic contexts. For instance, a central person in a social structure is one that maintains many interactions with other individuals and, in particular, more interactions than expected by the person's prestige or social standing. This leads us to social network theory that provides an alternative understanding of centrality, one that needs to be considered in our interaction-based generalization of centrality.

4. Christaller Centrality and Network Centrality

Social network ideas have a long history, going back to at least the 18th century scientist Auguste Comte ([26], pp. 10–14). Social network analyses derive from Gestalt-psychology approaches and were developed since the 1930s ([27], pp. 8–9). In the 1970s, the term centrality was used in the context of social networks [26,28,29]. The aim is to understand interactions among social actors using a structural approach ([26], p. 2). While Christaller offered one clear definition of centrality, three models of centrality, and a very restrictive centrality measure, social network theories offer a fuzzy definition, several general interaction measures and no general model of centrality (Figure 2; e.g., [30,31]).

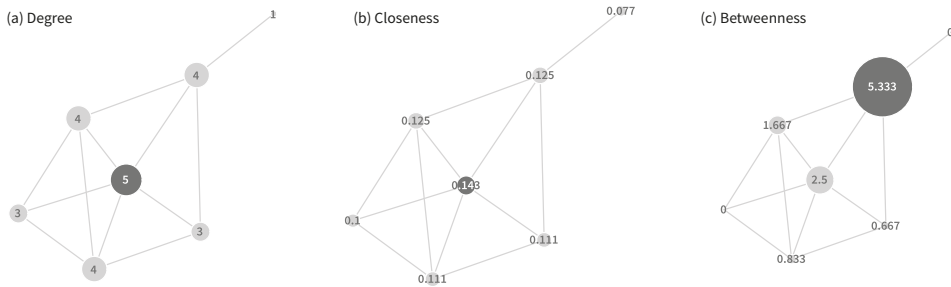


Figure 2. There are various measures of centrality in social network theory that describe different characteristics of a social network and its interacting individuals. The most common node centrality measures are: (a) degree, i.e., the number of adjacent nodes; (b) closeness that measures the centrality by calculating the average shortest distances to all other nodes; (c) betweenness that highlights critical nodes in the network structure by measuring to what degree a certain node lies in the shortest paths of other nodes ([32], pp. 180–182). Equations and a more detailed characterization is given in Freeman [28].

It becomes obvious that the two concepts, Christaller and network centrality, are very different. The measures and models of both approaches do rely on different assumptions and are in their basic form incompatible. In particular, the differences are the modeling approach as well as the definition and understanding of space. Christaller's models are based on a minimization of transport costs while there is no general optimization model in network theories. Network theories mainly map assumed or actual relationships according to simple rules. Social networks generally do not use transport costs, distances, or similar parameters as edge weights. Although it is possible to involve spatial attributes, by default, they follow a non-spatial configuration of networks, causing an understanding of centrality that is defined without an explicit reference to space.

However, we can apply our interaction-based definition of centrality to both. Taking into account the mentioned differences, we adjust the model of Christaller [5] and create one that integrates the ideas of the social network theory: Christaller's centrality model is not a general model of centrality but describes just *one* structure for minimizing transport costs which results in the existence of central places. Accordingly, Christaller's approach is concerned with *node* synergies while network centrality is concerned with *edge* synergies. The models of Christaller minimize transport costs by directing all interactions towards the closest node. A center can be detected by the relative accumulation of interaction at these nodes. Network centrality, and this is the missing model in the general discussion, can minimize interaction costs by bundling interactions along network edges. The interaction costs comprise transport as well as access costs of the nodes. This approach of optimizing systems of interactions is known under the term of *central flow* in geographic networks [33,34].

These two main types of centrality, Christaller centrality on the one hand and network centrality and central flow on the other, are complementary. One type can be dominant and this is an important characterization of a site, but every place has to be assessed according to both types.

5. Centrality Potential and Actual Centrality

Based on the above consideration, we can look at the centrality of certain places in networks from a different perspective. According to network centrality measures, such as betweenness (Figure 2c), it is possible that certain nodes have a high centrality only because they hold a geometrically strategic position. Analogously, a place can have many central functions and a high degree of interaction just because the population is high. However, is this centrality? According to Christaller [5], it is not. He emphasizes that centrality emerges when the degree of fulfilling central functions, i.e., the interaction intensity according to our approach, exceeds what we would expect based on the

population ([1], p. 27). Centrality is the relative meaning of a place and the absolute intensity of interaction has to be normalized by the population. This highlights the general idea of centrality that central places are not only important for themselves but particularly for their surrounding places; the interaction from these places that gather at the central place constitutes its centrality.

A large population is a supporting factor of centrality since a small village with just a few people cannot provide central functions for a territory with thousands of people. In addition, there are other factors attracting people such as natural resources, a strategic location, the occurrence of administrative institutions securing cultural functions, a high carrying capacity (e.g., in terms of agricultural productivity), the presence of a ritually important natural or cultural feature, etc. These factors, in combination with the population, set up the level of *potential centrality* (Figures 3 and 4b). This centrality potential is a theoretical construct. Its differentiation in four categories allows for comprehensively assessing the potential of a place to attract interactions in relation to the general configuration of its hinterland. It indicates the degree of centrality that is possible at a certain place under specific pre- and assumptions. The level of potential centrality can be exceeded for some time due to, e.g., “willpower” or political strength, but, eventually, centrality will fall back. The antique city of Pergamon under the realm of the Attalid dynasty is one example of a politically constituted central place [35]. The *actual centrality*, i.e., the measure of the central functions that are actually present at a central place (Figures 3 and 4a) can be lower than the centrality potential. This can be caused by historical contingency or the lack of a crystallization nucleus for the development of the central place.

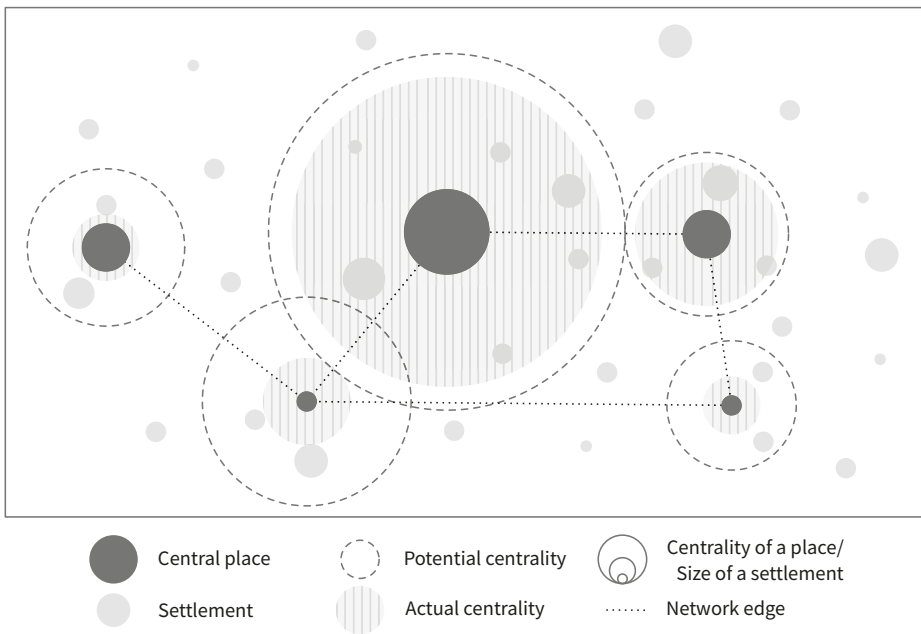


Figure 3. Sketch of the different centrality concepts. Not every settlement is a central place. For a place to be central, it has to offer central functions to its complementary region. This region can be defined based on Christaller or network centrality. The network edges in the figure show that only some sites interact, i.e., exchanging central functions. The differences between actual and potential centrality result from the combination of network integration of central places and their ability to serve their complementary region with central functions. Large deviations between potential and actual centrality point to the importance of historical contingency or intervening opportunities that influence the flows of interaction.

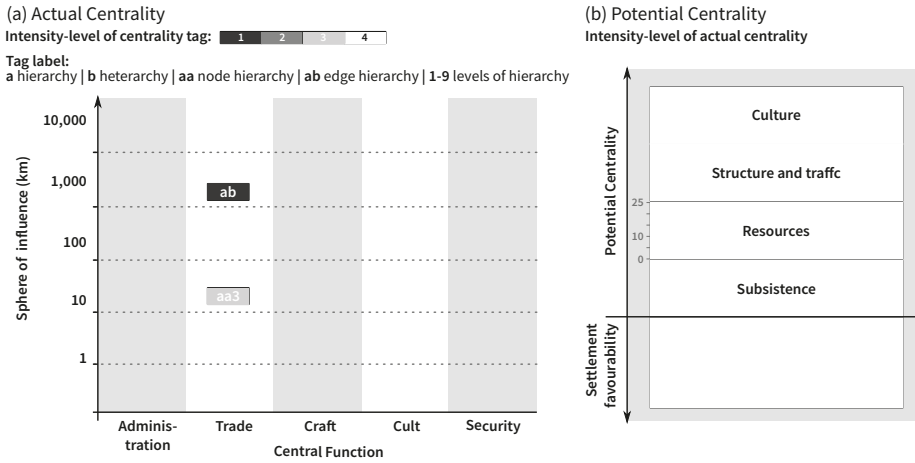


Figure 4. Centrality Graph as a tool to visualize and compare the different aspects of settlement characteristics, Christaller and network centrality (see text for a detailed explanation of the different elements).

These considerations can also be applied to the concept of network centrality: betweenness and similar measures show that network centrality is a structural property. This does not necessarily mean that important network nodes, according to centrality indices, show a high centrality in reality. In a network, those nodes are connected that have a certain relationship. The quality of the relationship and in particular the flows between the nodes are mostly not considered because they are not strictly required—this is an advantage of network approaches because such flows are seldom known. Due to this, the network centrality indices usually provide only the potential level of centrality. The main pieces of information for measuring the real, i.e., actual centrality, are not considered. In order to derive information on the actual centrality, a weighted graph has to be calculated, where the interaction and flows are used as weights and emerge as differences in centrality scores between the simple and weighted graph. Weighted networks require modified or new network centrality indices such as the c-index [36–39].

6. Centrality Vector

So far, we have shown that the different concepts of centrality complement each other and that different centrality indices are applicable. This enables us to view places from various perspectives and under different scenarios. In addition, it becomes clear that one measure alone is not sufficient since the various measures represent different kinds, aspects or dimensions of centrality. In order to assess which aspect constitutes the context-specific centrality of a place we introduce a centrality vector with four dimensions [2]:

1. The *intensity* of centrality that can be understood as the sum of interactions with other places. The number of central functions supplied by a center can be used as a simple estimator for the intensity of centrality. The use of actual flows offers a higher accuracy but requires more data. The degree of centrality can be used to measure the intensity of centrality in networks when the edges are weighted with flows.
2. Considering two places, one with a higher intensity but a limited range and the other one with a lower intensity but very remote connections, it is not easy to say which place is more central. Hence, the *range* or *sphere of influence* of a central place, is another dimension of centrality. It is

- a measure of the longest distance of an activity in which a central place is involved. For networks, we can use the closeness as an appropriate measure to assess the sphere of influence of a place.
3. A place with many subordinated places but just two levels of *hierarchy* may have the same centrality as a place with few subordinated places but many levels of hierarchy. While Christaller's approach allows us to estimate the hierarchical level of a place, this is not necessarily possible for networks which often are intended to be non-hierarchical. Hence, there is no appropriate network centrality index for this purpose.
 4. Is a place passively receiving interactions or actively controlling its own and other interactions? How many connections have to pass a certain node in a network? Betweenness is the index to answer such a question of *control of interaction*, i.e., a measure of the network location of a place in terms of assumed flows of information. The original concept of Christaller [5] does not cover this aspect, but it is possible to ask how exclusive a Christaller-center is as an interaction partner for the other places of a region—especially when we consider its network integration.

The four dimensions of the centrality vector reveal differences between Christaller and network centers. Concerning intensity, Christaller and network theory approaches show similar aspects. Differences become obvious in terms of the sphere of influence: network centers tend to have a wider range than Christaller centers. This is mainly due to the fact that the Christaller centers focus on a certain area. The hierarchy component is better mirrored in Christaller centers. However, under certain conditions, networks are also able to express hierarchies, e.g., using tree-graphs. The control of interaction is more typical for network centers.

These four dimensions of centrality can help to estimate the centrality type, but they are not sufficient for their classification. In practice, the classification of different organizational structures such as Christaller and network models is usually based on both, quantitative parameters and less precise, qualitative information. This leads us to our semiquantitative approach, which integrates these aspects.

7. A Semi-Quantitative Method to Analyze Centrality

As described above, in an analysis of centrality, a wide range of factors have to be considered. We need to deal with the different dimensions of the centrality vector and with potential and actual centrality. Even if measures for some components exist, the required data are rarely available at the preferred quality level. This contrast of concepts and available data have been present in centrality research since its infancy.

7.1. Central Functions as a Tool to Assess Centrality

In contrast to other studies that relate centrality to demographic factors based on Zipf's ([40], 1949) rank-size rule and indirect population measures (e.g., [41,42]), the *functional* aspect of places is focused in centrality analyses. This can be referred back to Christaller's definition of central places that are at first not settlements but spatial manifestations of central functions ([5], p. 25). In general, central places are clusters of functions that supply their complementary region ([43], p. 1307). To assess functional aspects of central places in a historical and archaeological context, Christaller's catalogue of central institutions had to be simplified to correspond to the smaller and less reliable database. For historical epochs, this was done by Denecke [44]. He classifies the functions and institutions that define central places in a historical context into ten categories, i.e., (1) political and administrative functions and institutions; (2) institutions of law; (3) institutions of security; (4) cultic and spiritual institutions; (5) cultural institutions; (6) institutions of charity; (7) institutions of agricultural economy and administration; (8) institutions of craft and production; (9) institutions of trade; and (10) institutions of traffic and transport ([44], p. 43).

However, an assessment of the central functions within an area necessitates the collection of the complete set of occurring central functions ([44], p. 43). Concerning earlier epochs, only a fragment of these functions are preserved or can only be accessed indirectly via archaeological sources ([44], p. 51). Gringmuth-Dallmer [45] further simplifies the concept by defining five central functions that characterize central places from prehistory until the Middle Ages: (1) administration; (2) security; (3) craft and industry; (4) trade; and (5) cult ([45], p. 8). The more of these functions that are present at a site, the more complex it is. Hence, central functions can be used to reconstruct settlement hierarchies—assuming the settlement sample is complete ([46], p. 431). Besides reconstructing settlement hierarchies, the occurrence and sphere of influence of central functions can be used to compare different archaeological sites in order to trace their different diachronic development (e.g., [2,35]).

7.2. Central Functions as Part of the Generalized Definition of Centrality

We propose a semi-quantitative approach which applies the simplified central functions and does not require a full-scale quantitative analysis (Figure 4). It was developed at the Excellence Cluster Topoi (Exc264) in Berlin via a comparative investigation of assumed and differently characterized central places of various prehistoric, classical, and historic periods [2,20,21,35]. The idea is to estimate the different dimensions of the centrality vectors on different scales and to map the results on a graph respecting the different central functions according to Gringmuth-Dallmer [45].

The centrality intensity is the most essential aspect, but its estimation is difficult due to the high data demand. According to this, we only use four classes of centrality intensity, indicated by the color of the centrality tag (Figure 4):¹

- Class 1 (dark gray): Extraordinary occurrence of centrality indicators; the centrality intensity is assumed to be very high.
- Class 2 (gray): Centrality indicators are well observable and indicate a high level of centrality intensity.
- Class 3 (light gray): Only few centrality indicators occur. The centrality intensity is medium to low.
- Class 4 (white): None or only marginal traces of centrality indicators are observable. This indicates a very low level of centrality intensity.

The range of the central places, i.e., the distance up to which interactions are observable is simply indicated by placing the coloured centrality tag at the appropriate location along the *y*-axis (“Sphere of influence”, Figure 4). Different functions and even different organizational structures have their own tag. Therefore, numerous tags can be put inside the different columns of central functions at different ranges.

The control of interaction is addressed by the organizational structure and specified by a label on the centrality tag. The organizational structures canalize interactions to certain network structures. The network can represent a hierarchy (label *a*) or a heterarchy (see [47,48]) without any subordinated places (label *b*). Hierarchies are subdivided into node hierarchies (label *aa*) and edge hierarchies (label *ab*). A hierarchy of nodes corresponds to Christaller’s concept of central places and the idea of synergies at nodes while a hierarchy of edges corresponds to network centrality and the related idea of synergies at edges.² Up to a certain degree, the number of central functions indicates the hierarchy level. If a precise level is observable, the number can be added to the centrality tag. A label *aa3* translates to a hierarchy of nodes with two subordinated hierarchy levels.

If a place is a local trading center according to the model of Christaller with a sphere of influence of 50 km and two subordinate hierarchical levels and at the same time a supra-regional trading centre according to the network model, with interactions up to 2000 km, the column “Trade” contains

¹ If required, or supported by the available data, more classes—shades of grey in the figure—can be used to express a wider range of intensity values.

² The original concept included further subdivisions which are not presented in this paper due to the better readability of the reduced concept; interested readers are referred to Nakoinz [2].

a centrality tag with the label *aa3* at 50 km and another tag with the label *ab* at 2000 km. The different shades of gray of the tags indicate a dominance of one organizational principle; in this case, the network centrality, over the other (Figure 4a).

In the case of trade (Figure 4), we estimate the maximal distance of commodities traded from or to the central place from other places which seem to be exclusively connected to the actual centre according to the spatial distribution of imports and places. Hence, we add the *aa* label at the corresponding range. Afterwards, we search for more remote imports and hence the overall maximal distance of imports to place the *ab* label. The other factors such as centrality intensity are less prominent in the diagram than range since it is more difficult to estimate them.

The centrality potential is presented in the right part of the graph (Figure 4b). This part is split into two sections. Above the horizontal axis, subsistence, resources, structure and traffic, and culture are factors summing up the centrality potential. Below the horizontal axis, the settlement favourability is assessed. The idea is that, above the horizontal line, only those factors are present that attract central functions and hence promote centrality. Below this line, the factors attract settlements in general and do not account for the concentration of interaction. This lower part shows how likely it is for a nucleus of a central place to appear while the upper part shows the likeliness of central functions to emerge. This is especially useful to visualize the “un-centrality” of an area in terms of resources or socio-cultural variables. The height of the blocks is rather relative. A ‘normal’ situation with not extraordinary low and high potentials would be half of the height while smaller or bigger blocks indicate good or bad conditions. Due to the changing factors (e.g., new settlement structure, overused soil, etc.), centrality potential can change over time.

In our example, the different blocks in the upper part of the centrality potential figure can each contribute up to 25% to the total potential, indicating the maximum attractiveness. If available, real measurements can be used to normalize this graph, but, usually, they will not be available and intuitive estimations used.

The centrality graph intends to provide a simple tool to visualize and compare different aspects of centrality. The various aspects of centrality and central functions are explicitly shown. This allows a much deeper understanding of the processes and relationships than would be possible by simple checklists of central functions or size-based maps of central places. The centrality graph is based on the idea that central places do not follow a general scheme but are forming a heterogeneous, though related, corpus of places. Since the available data is usually limited and patchy, the main advantage of this approach is the moderate requirement of input data. Centrality graphs integrate quantitative and qualitative information, sound data, and general estimations to a synthesis of the main factors characterizing place.

8. Case Studies

The focus of our paper is on the theoretical aspects of centrality and central places. Hence, the two following examples should be considered conceptually. Detailed, data driven investigations will provide a more nuanced reading and interpretation. Two sites, the Iron Age princely seat Heuneburg in Southern Germany and the Roman Imperial palace Felix Romuliana in Serbia, are used to sketch the application of the semi-quantitative centrality assessment (Figure 5).

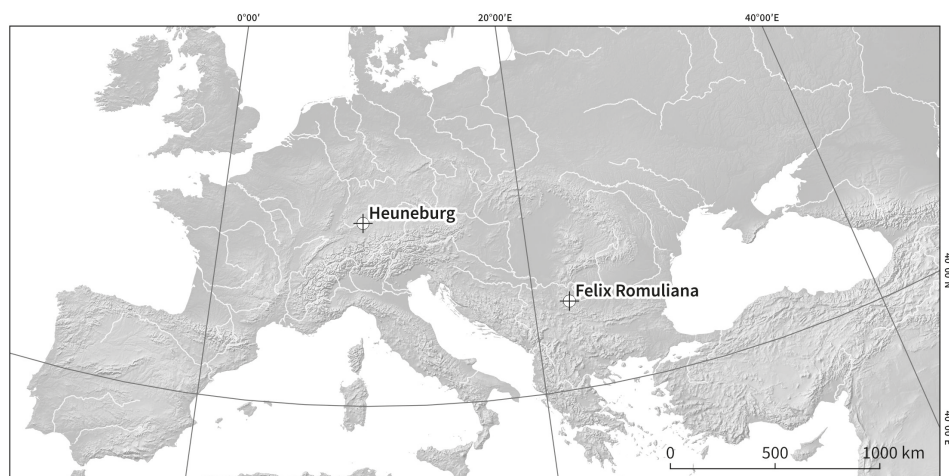


Figure 5. Location of Iron Age princely seat Heuneburg and Roman Imperial palace Felix Romuliana.

8.1. Felix Romuliana

The personal will of people in power is reflected in the erection of an imperial palace, the UNESCO world heritage site of Felix Romuliana, in a remote, rural area of modern Serbia, 50 km West of the Danube and close to the provincial town of Zaječar.

Felix Romuliana was erected at the beginning of the fourth century CE. It is located at the place of origin of *Gaius Galerius Valerius Maximianus*, Emperor from 305–311, and named after his mother Romula ([49], p. 124). The palace was built on an older fortification and extended with representative buildings and baths to serve the emperor as his summer and retirement residence ([50], pp. 275–277). The site shares the function as a residence seat with other places, so that a polyhierarchical structure can be assumed [51,52]. The environmental characteristics of the site and its surroundings are suitable for agricultural production [53,54]; this is mirrored in an intensive settling activity since the Bronze Age [55,56]. In addition, in the vicinity of the site are important long-distance routes that were used to trade mineral resources that were exploited here and that could be controlled by numerous forts along the accompanying mountains ([57], p. 130).

As part of the first tetrarchy, Galerius was appointed Cesar in 293 CE and in charge for the Eastern part of the Roman Empire. Diocletian's abdication in 305 CE promoted Galerius to the rank of Augustus. This initiated the second tetrarchy ([58], pp. 782–783). The tetrarchy structure of senior and junior emperor was a system that aimed to conserve the imperial structure and its stability. In the short phase of tetrarchy, Felix Romuliana played an exceptional role, which can only be attributed to the Galerius affinity to its mother and/or its place of origin. The atypical location decision is nicely reflected by Srejić and Čedomir [49]:

“The place chosen for the resting place of a mighty ruler, Diocletian's adopted son and, consequently, member of Jove's family, must have had quite a special architectural character. Galerius, glorified as a new Romulus and Alexander throughout the Empire after his triumph over King Narseus of Persia, was certainly not likely to consent that the edifice dedicated to him in the place where he was born and which was to bear the name of his mother should look like a provincial civil or military settlement” ([49], p. 124).

However, after the finding of an archivolt with the carved inscription *FELIX ROMULIANA*, there is no doubt that the palace was the chosen emperor's seat ([49], p. 127). Accordingly, Galerius' decision

caused the supra-regional importance of the central function *administration*, as mirrored in the erection of administrative buildings at the site that would have served the needs of the highest administrator in the Roman Empire.

Opposite the palace are two tumuli, erected on top of prehistoric cult places, where Galerius and his mother were buried ([59], p. 242); Felix Romuliana became not just a political-administrative but also a cult center, though the sphere of influence of the central function *cult* was most likely smaller ([49], p. 141).

After Galerius' death, the residence was abandoned and only a local center of metal production remained, causing the influence of the place on the regional interaction structure in terms of *craft* and *trade* [60]. The area became an important shelter for early Christians as mirrored in the erection of numerous churches within and in the surroundings of the former palace walls ([61], p. 122). Hence, the place offered the central function, *security*, on a regional scale.

Based on these different observations, we can draw a preliminary sketch of the change of centrality at the site that can be useful to guide future research: before and after the erection of the imperial palace, Felix Romuliana can be considered as a Christaller central place with a regional sphere of influence (Figure 6a, top). The place was integrated in supra-regional networks but did not offer central functions on this scale. The older fortification and its location close to important routes was of regional importance during the political changes after the Dacian retreat. The peak in the sites' centrality occurred when Galerius selected his focal point in the fortification network (Figure 6a, bottom). After his death, the political power to influence the flows of interactions vanished and likewise the supra-regional importance of the site. Like before, the area remained as an interaction node of regional importance.

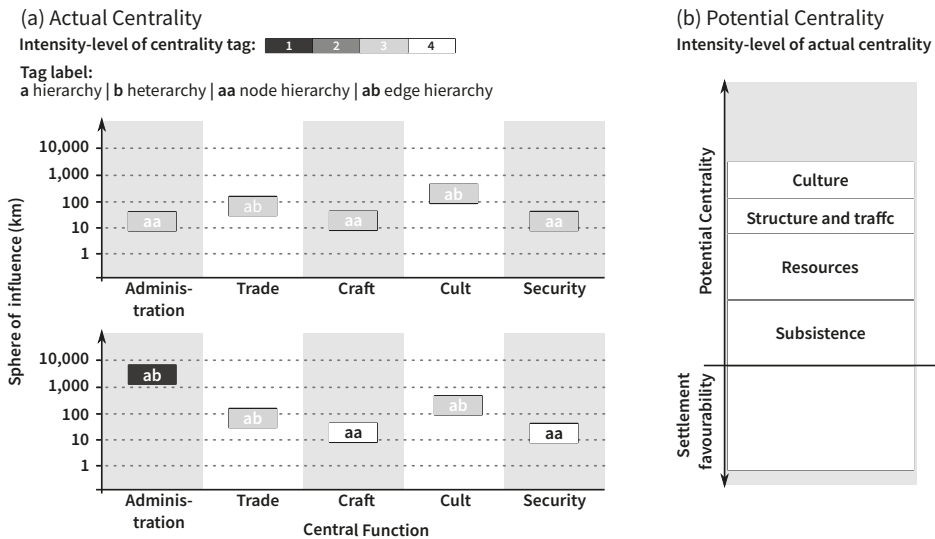


Figure 6. Centrality Graph of Felix Romuliana. (a) actual centrality of the place and its environs; top: before and after the palace phase; bottom: during the palace phase; (b) potential centrality of the site (see text for a detailed description).

The high centrality potential (Figure 6b) is in contrast to the relatively low actual centrality. This can be attributed to the fact that other places offered even better conditions and that networks of interaction with supra-regional importance were in place before. The different central functions

offered by the area of Felix Romuliana and its short increase in importance due to political will were not sufficient to sustainably change the flows of supra-regional interactions. On the local scale, it was and remained a complex center. Taken together, the site can be considered as a classical example of an *ephemeral increase of centrality due to arbitrary reasons*.

8.2. Heuneburg

The Heuneburg is one of the so-called “princely seats” from the Early Iron Age, located at the Upper Danube in southwest Germany [62]. Traditionally, these fortified places are assumed to be centers of power and seats of the elites that rule over big territories. The Iron Age settlement existed from the end of the seventh century until the first half of the fifth century BCE. The Heuneburg is assumed to be the antique place of “Pyrene” as mentioned by Herodotus [62]. The site had a phase of prosperity and growth in the *Ha D1* period which ended abruptly at the turn to *Ha D2* in the second half of the sixth century BCE. In *Ha D2* and *Ha D3*, the structure and population of the Heuneburg differed. In particular, the external settlement ceased to exist in *Ha D2*, causing a decrease of population from ca. 5000 to ca. 3500 [63–65]. The end of the *gateway* Heuneburg can be attributed to the fact that the main attracting factor of the location, i.e., its location as a network hub, became obsolete. Although the crossing of important transport routes persisted, the border of different organized areas moved northwards to the next line of princely seats. After the loss of the network-related central function, the place had no influence on the interaction structure and flows between two different areas [66].

Without substantial written sources, *administration* can hardly be assessed. The evidence of extraordinary rich graves with gold objects, imports and other precious objects is interpreted in different ways: some colleagues think of royal dynasties and kings [62], others consider different kinds of elites [66] and even a strong competition between groups [67]. The concept of prestige in contrast to status is also relevant here [68]. The elites might not have had a fixed status as rulers, but they reflected their strong ambitions by showing prestige artifacts and wealth. Nonetheless, we can assume a certain level of centrality intensity according to the prestige finds and the accumulated wealth. The range is also difficult to estimate. Since the idea of ruling big territories is only an assumption and there are indicators for rather small exclusive territories, we should not set the sphere of influence too large [66]. Based on the analysis of different social categories of the burials, we can deduce several social classes and perhaps social hierarchical levels. The collapse of the Heuneburg community at the turn of *Ha D1* to *Ha D2* could also be linked to a population that exceeds a population threshold for non-hierarchical societies [65]. This questions the hierarchical interpretation of social classes but even if the social hierarchy were clear it unfortunately cannot simply be transferred to the settlement hierarchy. Concerning the control of interaction, we can assume a mono-hierarchy with an exclusive core area. In addition, similarities of the princely seats indicate a social and perhaps political network between the different sites represented by an *ab*-model (Figure 7a).

Trade connections can be estimated by recording the incoming objects. In terms of spatial interactions, the central function *trade* has a high intensity. The regional trade can, on the one hand, be estimated based on the distribution of objects produced at the Heuneburg and on the other hand based on the origin of objects. In the case of stable isotope analysis, the origin is not known, but the minimal distance to regions with the required isotope profile can be given. For animal bones, this is about 50 to 60 km ([62], p. 478). The various kinds of Mediterranean imports can be used to indicate trade using network organization.

Concerning *craft*, there are traces of ceramic and metal production. The red-white painted ceramics distributed in the area until Lake Constance were probably produced at the Heuneburg [69]. Metal production was not specialized and seems to have only local importance [70]. Fibulae probably produced at the Heuneburg have been distributed in the region. For this regional distribution, a Christaller-like system, i.e., an *aa*-model has to be assumed (Figure 7a). A wider distribution throughout a network cannot be excluded, but the evidence is not available.

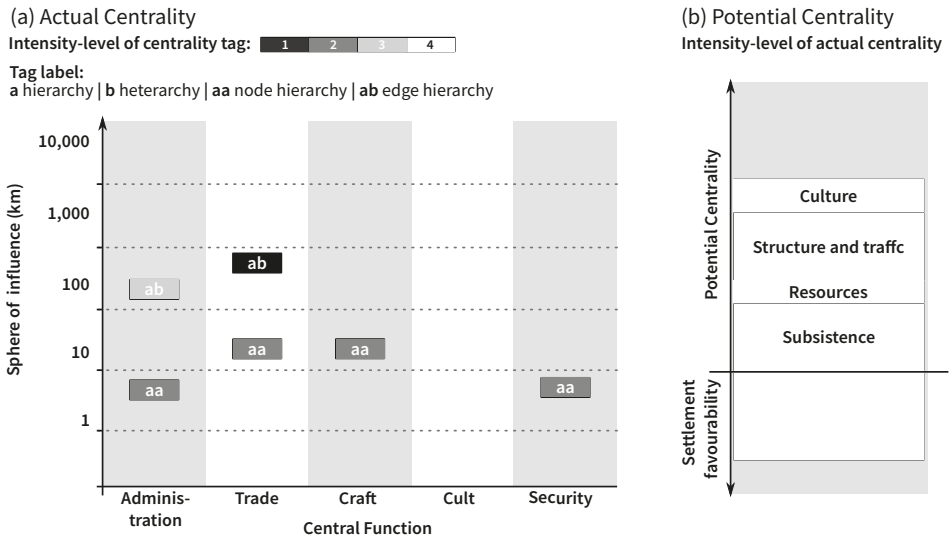


Figure 7. Centrality Graph of Heuneburg (see text for a detailed explanation of the different elements).

At the Heuneburg, there are no indicators for *cult*. The walls are clear evidence of the central function *security*. The symbolic value of the fortification, which was built as a mud brick wall, sometime around 600 BC probably inspired by Mediterranean prototypes, is certainly high. The fortification itself was hardly used to protect more people than the population of the Heuneburg. This function reflects an *aa*-model.

The settlement favourability of the Heuneburg can be estimated as being a little below average (Figure 7b). The same can be said about resources and culture. In terms of subsistence as well as structure and traffic, the potential centrality is higher: the Heuneburg is located at the edge of the Swabian Alb providing access to different areas, different types of land use and hence different subsistence strategies providing rather stable subsistence opportunities. The Heuneburg is also located at the shore of the Danube, an important waterway and transport route, and at the same time at a crossing of the Swabian Alb. The combination of these factors is the reason why the Heuneburg developed to a kind of gateway, structuring the exchange between two differently organized areas south and north of the site [66,71].

9. Discussion

Both examples show places which possess a certain degree of centrality for some time and a loss of it after a significant change of parameters. In the case of Felix Romuliana, the centrality was caused by an outstanding central person: located close by but not along supra-regional exchange and communication routes, Felix Romuliana is a typical example of a central place in an “un-central” landscape. Thanks to the power of a “central person”, the natural centrality potential of the place was exceeded for some time. This effect is mirrored in the centrality diagram that shows an increase of one function while the others stay at the same level or even decrease in their intensity. In the case of the Heuneburg, we infer that the centrality was caused by the situation of the site at the border between two differently organized areas. Such a location demands a *gateway* and the organization of exchange. The more important the inter-regional exchange, the higher the demand for a gateway and the larger the centrality potential. Since this centrality potential is directly based on the network configuration and only indirectly linked to the environment, we can refer to such situations as (1) “central” landscapes

in the sense of a socio-economic and political landscape as well as (2) “un-central”—in the sense of un-necessary—landscapes in terms of natural resources.

Although both sites show a similar development according to some general factors, the examples represent completely different historical processes and highlight the fact that it is important to consider the context and the individual processes. There is no standard central place but a multitude of different places with different histories and different parameters gaining certain degrees of centrality based on different centrality profiles. Accordingly, the same holds true for central or un-central landscapes. Economy, historic situations, outstanding persons and structural properties in interaction networks are only some of those factors contributing to individual developments of centrality. Furthermore, there is no static centrality but historic processes, which cause different places to have different degrees and profiles of centrality for certain periods of time. Hence, the two examples demand a diachronic perspectives and pluralistic approaches—that can, for instance, be synthesized within centrality graphs and polyvocal interpretations.

10. Conclusions

The approach presented in this paper opens new perspectives of integrated centrality research. It helps to understand the reasons and motivations that caused centrality in a landscape setting that would normally have been described as “un-central”. The usage of a centrality vector, the integration of Christaller- and network-centrality, and the consideration of the centrality potential provides comprehensive insights into the actual processes and states of the settlement systems. The interaction-based concept of centrality and the semi-quantitative approach enable and support comparisons and visualizations of the main factors that make up the centrality of a place. The systematization of centrality dimensions in combination with central functions guides research and helps to consistently present heterogeneous and complex results. We achieve a better understanding of various aspects of centralization that are usually ruled out by centrality analysis: for instance, (a) different sites develop different dominant centrality profiles and (b) different central functions are organized according to different structures and strategies. Each central function requires its context, a context that is shaped by a temporal, cultural, and natural relatedness. To acknowledge the complexity of the centralization process and heterogeneity of places, we need to focus on the comparison of sites and the interpretation of individual processes. This comparative and individualized approach, in combination with a straightforward and easy to use semi-quantitative centrality graph helps to circumvent the *cul-de-sac* of oversimplification and inappropriate analytical tools. We are confident that centrality graphs, as presented here, can develop to be the dominant front-end for pluralistic analytical approaches that integrate the different dimensions and facets of centrality.

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Article

The River as an Economic Asset: Settlement and Society in the Xeros Valley in Cyprus

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Abstract: Settled and Sacred Landscapes of Cyprus (SeSaLaC) is a systematic archaeological survey project of the University of Cyprus in the Xeros River valley in the Larnaka district in Cyprus. This article aims to present a first synthesis of the diachronic settlement pattern in the region. After a short introduction on the area and the SeSaLaC project, we attempt to identify and interpret settlement evolution and landscape changes in the region, from early prehistory to Late Antiquity. The contextualisation and evaluation of settlement changes in the Xeros River valley are carried out within a multi-layered framework along the main strands of approach presented in this *Land* special issue. The presentation and analysis that follows below is a work in progress.

Keywords: Cyprus; landscape archaeology; surface survey; river valley; settlement organisation

1. Introduction: Settled and Sacred Landscapes of Cyprus (SeSaLaC)

SeSaLaC is a multi-period surface survey project led by the University of Cyprus in the Xeros River valley, 2500 ha in size, situated 20 km southwest of Larnaka and 5 km inland from the south coast of Cyprus in the Larnaka district (Figure 1). The project aims to identify, map, and interpret traces of pre-modern human activity in the valley in order to examine the interaction of secular and religious space with the natural environment. A range of informed methods of intensive field survey has been employed, such as the systematic counting of pottery densities in transects running north-south throughout our survey area, aerial photography, micro-topographical surveys, and the in-situ digital recording of archaeological information and monuments, using the technical equipment of the Artefact and Landscape Studies Laboratory (ArtLandS Lab). The transects plotted throughout the Xeros valley comprise continuous zones of 150 m in width at 150 m intervals; walkers lined up within each transect-unit (150 × 150 m) were spaced 15 m from one another and recorded the number of surface ceramics and lithics, architectural remains, and surface visibility with the aim of identifying unknown archaeological sites. Non-surveyed sectors in the Xeros comprise built-up areas (e.g., present-day villages and the highway), fenced private property, thickly-vegetated grounds and/or natural barriers (e.g., the Xeros River, streams, steep slopes, etc.). Identified sites were gridded at the following stage into 25 × 25 m squares, and a finer survey was conducted by a group of field-walkers spaced at 5 m from one another. The largest site in size located at the heart of our survey area, mostly dated to the Late Antique era (i.e., Kophinou-Panagia, discussed below), was surveyed during the first season of the project in 2014 in a field-by-field manner, with walkers spaced at 5 m intervals.

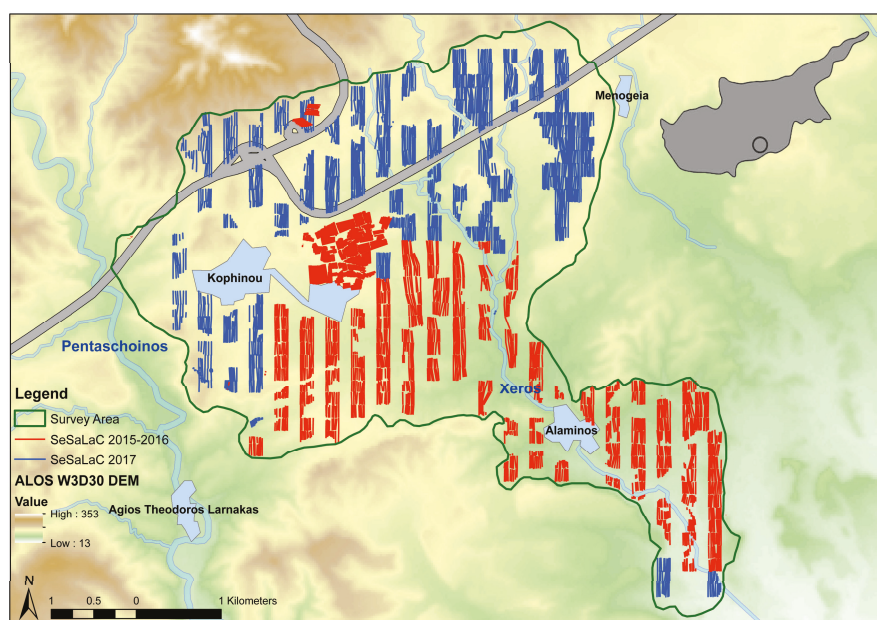


Figure 1. SeSaLaC surface survey area with transects (zones of squares: 150×150 m) investigated in 2015–2016 and 2017. ALOS DEM are in metres. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).

Surface material evidence of ancient rural activities in our region includes contemporary agricultural terraces, impenetrable hilly areas, and visible archaeological features, but this activity is represented mainly by poorly preserved pottery. Thus, the identification and the subsequent distinction amongst different types of rural settlement pose challenges for the regional survey [1–3]. We very much base our research on the spatial analysis of settlements that emphasise location in association with natural resources (mainly soil and land types, copper mines, and water availability). In these attempts, Geographic Information Systems (GIS) have proved to be very useful, and their employment has assisted us in contextualising rural sites within their habitation and economic frameworks, maintaining in mind, at the same time, the problems around their deterministic nature (cf. [4] (p. 552, with references) [5] (pp. 149–150).

The village of Kophinou at the centre of the survey area (Figure 1) lies nowadays in a landscape almost devoid of recent development and is archaeologically a *terra incognita*. The survey area is located today at a major junction of the island’s motorway, linking the capital Nicosia with the towns of Larnaka to the southeast, Limassol on the south coast and Paphos to the west. Its location on the edge of two or three Iron Age polity territories (for the discussion on the problem of co-existence of Idalion and Kition as independent polities, see [6] (pp. 33–34)), its immediate proximity to the major infrastructure of the Roman road network, its selection as one of the most strategic enclaves of the Turkish Cypriots in the 1960s and, nowadays, the establishment of the only governmental Reception Centre for Asylum Seekers in Cyprus at Kophinou (hosting refugees from Syria), confirm the centrality of this un-central rural landscape diachronically. As we explain ‘centrality’ in the introductory article of this *Land* Special Issue, we view first Alaminos-Kambos, and later Kophinou-Panagia as ‘central places’ within their micro-regions, related to a hierarchical system of settled spaces, environmental, and topographical parameters, the availability of and control over natural resources and the construction of dependent territories around them. In many respects, the microenvironment of the survey area, defined by a

continuous series of hills, crossed by the Xeros River, and located within the ‘landward buffer’ of Cyprus, provides an ideal laboratory for examining settlement systems in the *longue durée*.

2. Settlements Systems in the Xeros Valley from Prehistory to Late Antiquity

Xeros (meaning the ‘dry river’ in Greek), or Xeropotamos as some locals call it, stems from the area west of the Stavrovouni Mountain and flows into the sea, a few meters away from the modern yacht shelter in Alaminos. The river creates a fertile valley along its way, where people from antiquity to this day used a canalisation system to water their orchards. Preliminary GIS mapping of the agricultural soils and settlement activity [7] (Figure 2) has shown that the main settlements lie in the middle of less fertile soils; this should probably be seen as a very wise choice on behalf of its inhabitants, making use of less productive areas for their settlements’ built space, as well as for less demanding cultivations, such as vegetable gardens and olive groves or as pasture land. In addition, the region immediately north of the Xeros River valley is within the copper zone of the Troodos ophiolite (Figure 3); however, the good quality mines (pillow lavas and basal group formations richer in copper) are actually located on the other side of the Troodos Mountain range at Mathiatis, as evidenced also by the archaeological evidence [4] (p. 543, figure 1).

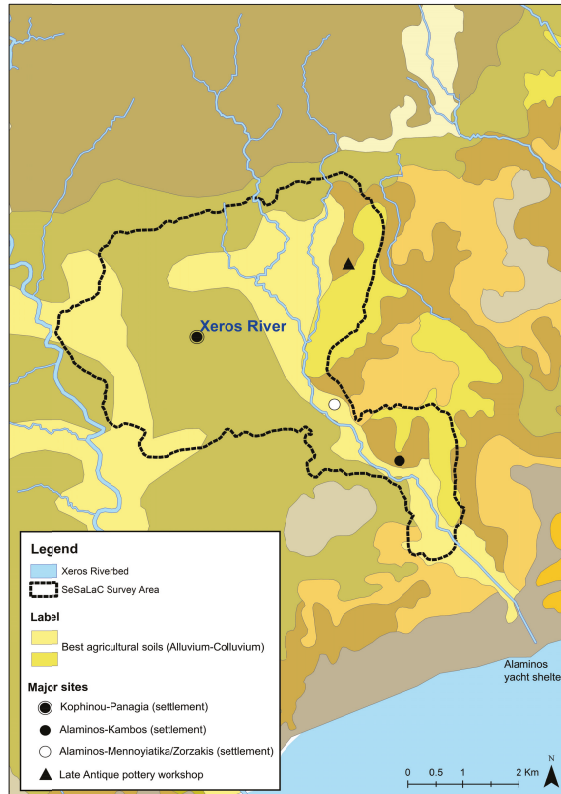


Figure 2. Best agricultural soils in the Xeros River valley according to the Soil Atlas of Europe and the relation of the Late Antique site of Kophinou-Panagia and the Early-Middle Bronze Age settlement of Alaminos-Kambos with their surrounding agricultural territory. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).

Our team is already investigating how environmental changes and/or tectonic activity may have contributed to riverbed shifting, and how these may have affected people and settlement activity diachronically. Interviews of our team with the locals inform us that even a few decades ago, the Xeros was not as dry as it is today; quite the opposite, locals remember running water in the Xeros, reaching its full capacity. We hope that the upcoming geological study by our team (still in progress) will further clarify this picture. In addition, funding and findings permitting, geoarchaeological (and maybe osteological) studies in the future may reveal whether the region and its people, at specific times, went through particular physical stress.

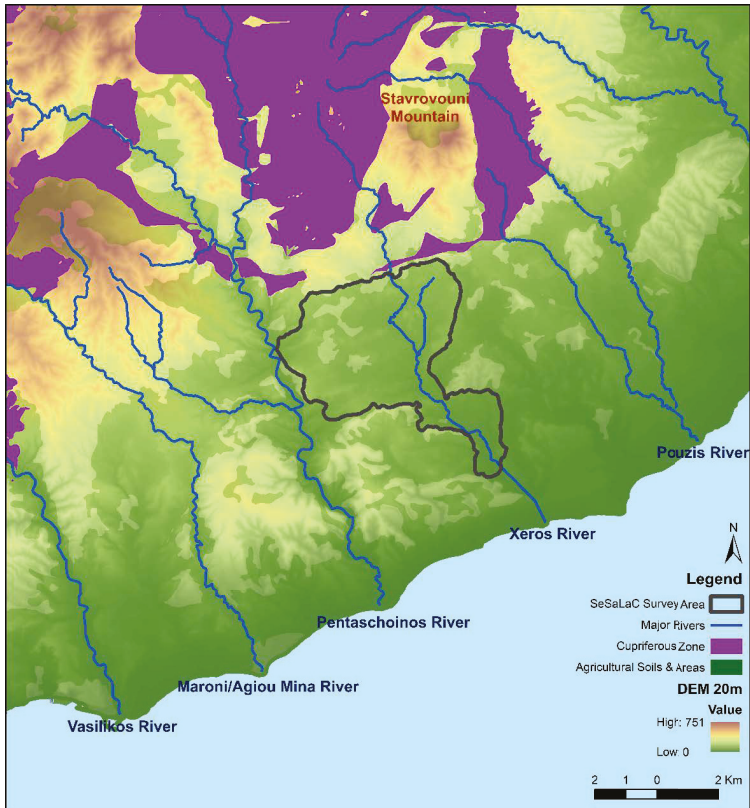


Figure 3. Regional map with the SeSaLaC survey area, major rivers, cupriferous zone, and agricultural soils and areas. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).

Future research should also integrate survey data with geological investigation, considering that some rivers along the southeast coast may (at least seasonally and/or simply via land routes) relate with a system of identified anchorages, used in conjunction with overland portages for transporting timber, copper, and other goods downstream to the coast for processing and cabotage [8] (cf. [9–11]). Although there is no evidence for built harbours, A. Bernard Knapp notes that several potential harbours have been identified along the south coast between Palaipaphos and Hala Sultan Tekke [12] (pp. 139–140, with references), including Alaminos-Latourou Chiftlik [12] (p. 3, figure 2). While the international maritime connectivity of Cyprus diachronically has been emphasised on various occasions, we still lack a solid methodology for approaching coastscapes (encompassing the shoreline, the coastal lowlands

and the communication routes with the hinterland) and small-scale, regional interaction; the work of another project west of our area, in the nearby Maroni and Vasilikos valleys, shed further light on these south-central coastscapes [13,14] (with references). We also hope to be able to integrate geophysics and other disciplines into our study area in the future: The integration of zooarchaeology, archaeobotany and ethnoarchaeology in Cyprus, for example, has recently shown that not only the adaptation of sheep and goat management to differences in vegetation and landscape locally, but also that other elements in the landscape, such as wells, springs, rivers, pools of fresh water and safe access points to the sea, are integral parts of herd management [15].

For the remainder of this contribution, however, let us first focus on the results of our fieldwork in the valley, contextualising the diachronic settlement pattern from prehistory to Late Antiquity. The contextualisation and evaluation of settlement-change in the Xeros River valley is carried out within a multi-layered framework or along five main strands of approach: (a) *Siedlungskammer* or ‘Settlement Chambers’, (b) ‘Central Place Theory’ and settlement hierarchies, (c) ‘Ecosystems’ and land-use, (d) ‘Sacred Landscapes’ and (e) ‘Political Economy’ [16] (with references).

2.1. Before the Early Bronze Age

Apart from a small concentration of lithics that remains at present undated (Figure 4), but could potentially extend back to the Aceramic Neolithic (ca. 9000–5200 BC), the earliest more securely (based on pottery fragments) dated evidence for human presence in the Xeros River valley belongs to the Late Neolithic (ca. 5200–4000) (these early phases, up to the end of the Bronze Age, are currently under study by the member of our research team Charalambos Paraskeva). The site of Kophinou-Kophinos, on a hill north-east of Kophinou, may be the earliest site (probably a settlement) identified in our area of research so far.

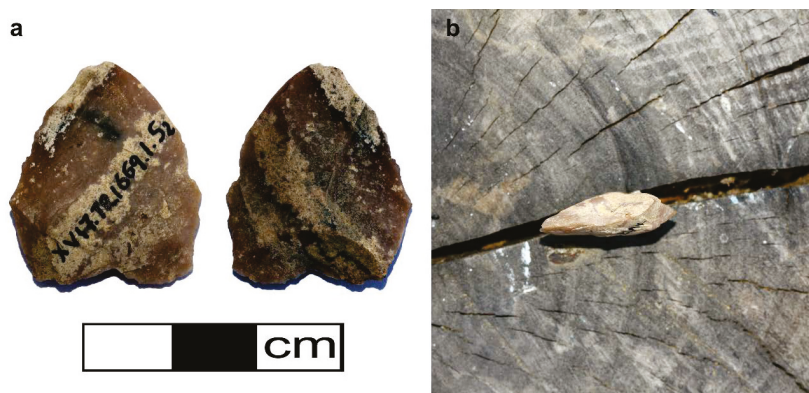


Figure 4. Lithics currently under study: (a) Arrowhead on both sides; (b) arrowhead side-view on tree-trunk stump (Images by Charalambos Paraskeva).

The site of Alaminos-Mennyiatika/Zorzakis is the only Chalcolithic settlement site identified in our survey area. Our team relocated the site based on information from the late Porphyrios Dikaios (former Director of the Department of Antiquities, Republic of Cyprus), who conducted surface collection and trial excavations at the site back in 1936 (Figures 2 and 5). The site dates to the Middle Chalcolithic period (ca. 3500–2900/2800 BC) and is located at the narrow passage that opens into the valley of Alaminos, on the eastern bank of the Xeros River (personal communication with C. Paraskeva, 23 September 2018; cf. [17–19]). During sanitation works for the construction of a house, our team recently identified and recorded the remains of a floor from a Chalcolithic roundhouse with evidence for a hearth, pottery and stone tools protruding from the section (Figure 6). Sites dating

to this period, such as Kissonerga-Mosfilia, Lemba-Lakkous, Souskiou-Laona, and Erimi-Bamboula in west or south Cyprus, have been systematically excavated [20] (pp. 206–215, with full lists of the publications for each excavation) [21] (pp. 83–118). While this may partly result from the fact that other projects east of Xeros may have not always included specialists on the Chalcolithic period, Alaminos-Mennoyiatika/Zorzakis remains the easternmost known Chalcolithic site on the island to date.

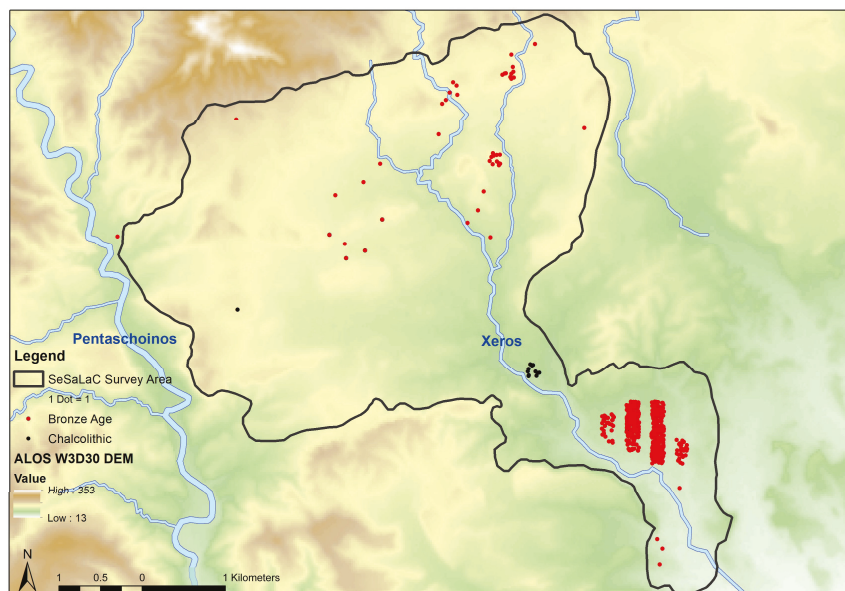


Figure 5. Chalcolithic and Bronze Age pottery distribution. ALOS DEM are in metres. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).



Figure 6. The remains of a Middle Chalcolithic floor, most probably belonging to a Chalcolithic house (Image by Charalambos Paraskeva).

2.2. Early and Middle Bronze Age

The Department of Antiquities of the Republic of Cyprus had previously undertaken the excavation of trenches at the site of Alaminos-Kambos unearthing stratified pottery of the Early (ca. 2250/2200–2000/1950 BC) and Middle (ca. 2000/1950–1680/1650 BC) Bronze Age, some walls, and floor installations [22] (pp. 90–91), (cf. [23] (pp. 445–446)). In addition, following an accidental discovery, the Department of Antiquities excavated an intact Early Bronze Age tomb south of the settlement, where a skeleton and 7 well-preserved Red Polished Ware vessels were recovered (Figure 7). Our systematic survey in the Xeros River valley has identified Early and Middle Bronze Age evidence for intensive settlement activity south and east of the medieval tower of Alaminos at this site (Figure 8). The dense concentration of pottery, accounting for more than 700 sampled potsherds (Figure 5) dated to the period (and many more counted in the survey transects of the site), together with other artefacts, such as millstones and grinding tools (Figure 9), suggests the presence of an enormous settlement. The maximum spread of material is ca. 70 ha, but it is not yet clear as to whether the concentration represents a site, multiple clusters of a site, moving households within the site at different phases of the long Early-Middle Bronze Age, or a central site with satellite cemeteries (for problems in site estimates in Late Bronze Age Cyprus however, see [24] (esp. pp. 13–16)). The possibility of initiating a geophysical prospection at Alaminos-Kambos may help us further clarify the situation. Moreover, we identified a small group of looted tombs along one of the streams of the Xeros River, on the easternmost edge of the site. In accordance with other Cypriot Early and Middle Bronze Age sites, cemeteries of the period seem to be located outside the settlement, usually on nearby hillsides.



Figure 7. Early Bronze Age tomb, excavated by the Department of Antiquities, Republic of Cyprus (Image by Anna Satraki).



Figure 8. The Medieval tower of Alaminos at the locality of Kambos (Image by Adamos Papantoniou).



Figure 9. A millstone and grinding tool (Image by Athanasios K. Vionis).

Jennifer M. Webb and David Frankel have associated the appearance of Alaminos and similar sites on the south coast and in the central lowlands of the island with the establishment of settlements near copper ore deposits [25] (pp. 73–75). As we emphasised above, however, the good quality mines are located on the other side of the Troodos Mountain range. Our team has identified slag concentrations at the east of the survey area (Figure 10), although these come from a later, probably Hellenistic, Roman or mostly Late Antique date, based on the ceramic evidence from these transects. It is true that, so far, we have not recovered any signs for copper processing from the Early and Middle Bronze Age site of Alaminos. It is more likely that Alaminos-Kambos was a waypoint on a trade route along the south coast [23]. According to Webb and Frankel, Early Bronze Age communities on the south coast and in the central lowlands may have been subject to lower levels of social pressure than those in the (nowadays occupied by Turkish military forces) northern region of the island. For example, funerary practices and architecture, as in the cases identified by our team and the Department of Antiquities in the Xeros River valley, show relative simplicity and uniformity in comparison with evidence from the north part of the island [25] (pp. 73–75). Tombs on the south coast and the central lowlands are either relatively simple small chamber tombs or pit graves; *dromoi* are rarely evident and appear to have been intended simply to provide access to the chambers rather than a space for performance as in the case of the north coast. In addition, these communities living in the south coast and the central lowlands were probably largely self-sufficient in comparison to the north of the island, where they seem to have had intensive external contact ([26] cf. [27]).



Figure 10. Copper slag concentrations to the east of our survey area (Image by Giorgos Papantoniou).

We hope that the future gridding of the site will further clarify the picture at regional scale. As suggested by the surface pottery recovered, the site of Alaminos-Kambos was established in the Early Bronze Age and continued to exist well into the Middle Bronze Age. Its size and population, however, cannot be safely estimated for any of the two periods due to the similar technological and other characteristics of the pottery and the lack of diagnostic sherds that can be safely attributed to non-generic Red Polished and other Bronze Age wares (see similar remarks in [28] (p. 34, Figures 3 and 4)). There is some—even if limited—evidence (such as dental enamel hypoplasia present on the dentitions of some skeletons excavated in some burials in Psematismenos or Marki) to suggest that, during the course of the Early Bronze Age, some communities on the south coast went through physical stress [25] (p. 75). It is possible that communities living in the relatively well-watered coastal plain and in river valleys, like the case of Alaminos, were better off.

2.3. Late Bronze Age

In comparison with other surface surveys and excavations west and east of the Xeros valley, it seems that, based on the existing evidence, the Late Bronze Age (ca. 1650–1050 BC) material is very limited. We need to point out, however, that this ceramic material is still under study. While we may be able to identify patterns of continuity from the Middle to the Late Bronze Age in the future, based on what we have recognised so far as ‘potential Late Bronze Age material’, such a continuity cannot be expected to be a major one in this region. In addition, with reference to the site of Alaminos-Kambos, such ‘rural’ settlement sites on the island were usually abandoned before the beginning of or very early in the Late Bronze Age [20][29] (p. 204). Nonetheless, the classic adage ‘absence of evidence is not evidence’ is very relevant to this case. Should we consider the possibility that the rural communities of the Middle Bronze Age in the Xeros River valley were gradually abandoned, following the rise of the complex copper-and-trade economic pattern at the beginning of the following period, and that their

populations were gradually absorbed by the primary centres of the coast in the west and the east of the Xeros River valley?

The Late Bronze Age of Cyprus has been characterised as the apogee of urbanisation in the second millennium BC [21] (pp. 149–186), [24] (pp. 305–308), [30–34]. Two important urban centres (for early urbanisation and problems around the terminology in the case of Cyprus, see [35] (pp. 6–10, with references) and [36] (with references)), Kalavassos-Agios Dimitrios and Maroni-Vournes lie west of our survey area [36–40]. Similarly, east of the Pouzis River (Figure 3), several Late Bronze Age sites have been identified [41] (pp. 397–400), [42]. As evidence from outside the Xeros River valley suggests, towards the end of Late Cypriot II (just before 1200 BC), a gradual (not necessarily total) abandonment of the south coast and the central lowland urban centres of the island took place, while people seem to have moved to coastal urban centres, such as Palaipaphos, Hala Sultan Tekke, and Kition [43,44]. The flourishing nature of Late Cypriot II settlements in the Vasilikos valley is evident, as illustrated by the Vasilikos Valley Project (Figure 11), for example, with the Kalavassos-Agios Dimitrios complex lying at its centre [45] (pp. 94–97) (in the context of the Vasilikos Valley Project survey, the term ‘site’ was used to designate a locality where artefacts indicate some sort of human activity during any or many periods, including settlements, burials, manufacturing, and agricultural processing. To avoid confusion, in Figure 11 we have retained the term ‘site’ as defined by the surveyors). Meanwhile, the later phase of the Late Bronze Age and the Early Iron Age are marked by abandonment, even though some Late Cypriot III and Cypro-Geometric sites have been identified [45] (pp. 97–99), [46]. After the demise of Kalavassos-Agios Dimitrios and Maroni-Vournes as urban centres, people seem to have moved gradually to urban centres on the coastline itself, while we attest no other urban centres in the broader region.

Based on survey evidence from throughout the island, we would argue here that human activity in the Late Bronze Age seems highly nucleated around urban centres. The published material evidence of the Late Bronze Age rural landscapes stands in contrast to the abundant evidence for Early and Middle Bronze Age agrarian economy [5] (p. 147). Thus, one may ask whether the rural countryside was devoid of human occupation, something which is not supported by recent studies, suggesting alternative ways of looking at the rural countryside in the Late Bronze Age [5,47]. While it is true that there was a nucleation of the population and a focus of interest on the primary centres situated along the coast, fieldwork and research activities alike have shown that the Late Bronze Age polities consisted of a solid network of site-hierarchy. The coastal urban centres are certainly much more visible as they accommodated monumental architecture. However, the aforementioned survey projects at Vasilikos and Maroni valleys, as well as excavation projects in the hinterland, such as Aredhiou-Voupeis which corresponds to an agricultural village [47], and rescue excavations of Late Bronze Age tombs in the northeastern slopes of the Troodos (Mathiatis, Sia, Lythrodontas, which probably correspond to mining villages) [48–50] all show the existence of secondary special-function sites in the hinterland that were undoubtedly associated with other centres. Systematic survey in the Xeros has not identified so far any surface evidence that could be termed as a ‘Late Cypriot site’, even if a tertiary hamlet or farmstead. This minimal evidence for the Late Bronze Age (at present at least) may be accounted for by the fact that it was possibly not associated with a major urban centre, and it may suggest that potential settlement localities at a considerable distance from urban centres on the south coast remained unexploited in terms of permanent habitation. On the other hand, seasonality of activity in the region is certainly a question to consider more closely in the future.

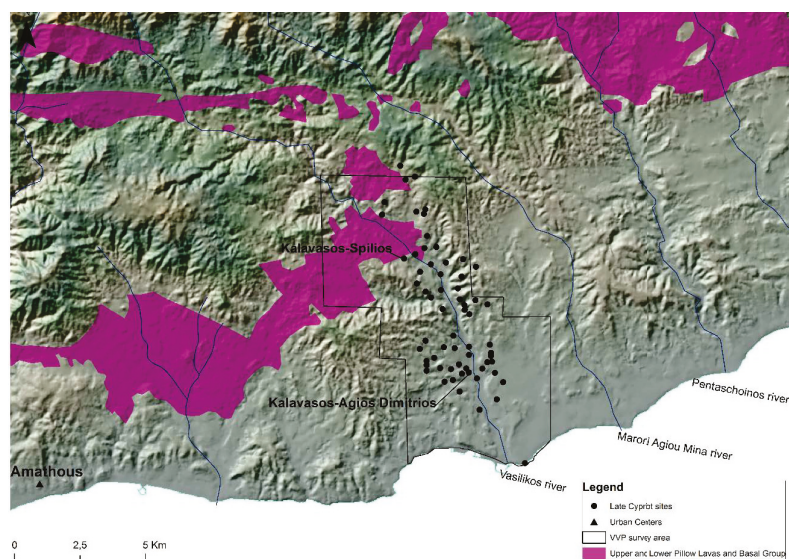


Figure 11. The Late Bronze Age centre of Kalavassos-Agios Dimitrios (and its settlement nucleation), west of our survey area. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Niki Kyriakou).

2.4. The Cypriot Iron Age

Only a thin scatter of possible Cypro-Geometric (ca. 1050–750 BC) material has been recorded during the course of our field survey in the Xeros River valley (the ceramic material is under study). While this picture may in part be caused by issues of archaeological visibility and the lack of adequately excavated and published Cypro-Geometric strata, it accords with other survey evidence from the extra-urban territories of the Cypriot Iron Age polities (also referred to as Cypriot kingdoms or city-kingdoms) [45] (pp. 97–99), [46,51,52]. To this problem, we should add a long tradition of research focusing either on the problems around the establishment of the Cypriot city-kingdoms or on the later Cypro-Achaic period, with a poorer interest in understanding rural landscapes and the Cypro-Geometric period itself (cf. [5] (with references)). Because of the limited presence of identified Cypro-Geometric settlement strata generally in Cyprus, the study of the existing mortuary evidence has been the main route for exploring the social, political, and economic transitions and transformations that the island underwent from the Late Bronze Age to the Iron Age (for the most recent and coherent discussion on this issue, see [6]). It is generally accepted that the Early Iron Age is a period that comes after a general disorder and movements of people and ideas in the broader Mediterranean. This unsettling period was a time when negotiations of individual, societal, and political identities took place. In the course of Late Cypriot IIIB/Cypro-Geometric I (ca. 1125/1100–950 BC), a new political geography began to be established on the island [6].

As we already mentioned, in the Cypro-Achaic (ca. 750–480 BC) and Cypro-Classical (ca. 480–310 BC) periods, the Xeros River valley became a flourishing un-central landscape (or territory) at the intersection of various central places—i.e., the urban centres of Amathous, Idalion and Kition—all of which eventually functioned as seats of an Iron Age polity (Figure 12). The north sector of the valley preserves evidence for the existence of small hamlets and farmsteads, around a larger centre of some 10 ha at the location of Kophinou-Panagia (Figure 13). Twelve looted tombs on the south edge of the same site may also date to this phase according to surface ceramic evidence (Figure 14), even if the site and this type of tomb continue to be in use later in the Hellenistic and Roman

periods (Figures 15 and 16). Such ‘satellite’ settlements in ‘un-central’ landscapes, such as the Xeros valley, were economically associated with (and probably under the political control of) a polity, most probably Amathous.

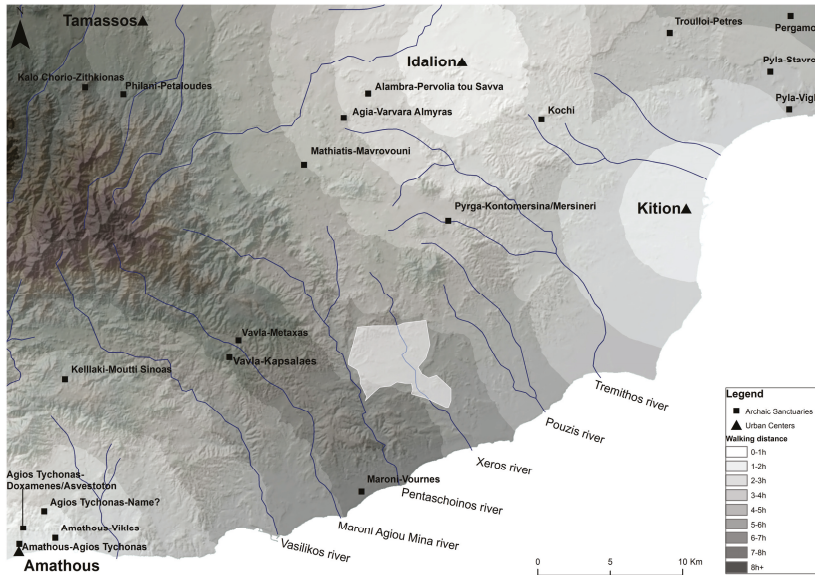


Figure 12. In the Cypro-Achaic period, the Xeros River valley became a flourishing territory at the intersection of various Iron Age polities. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Niki Kyriakou).

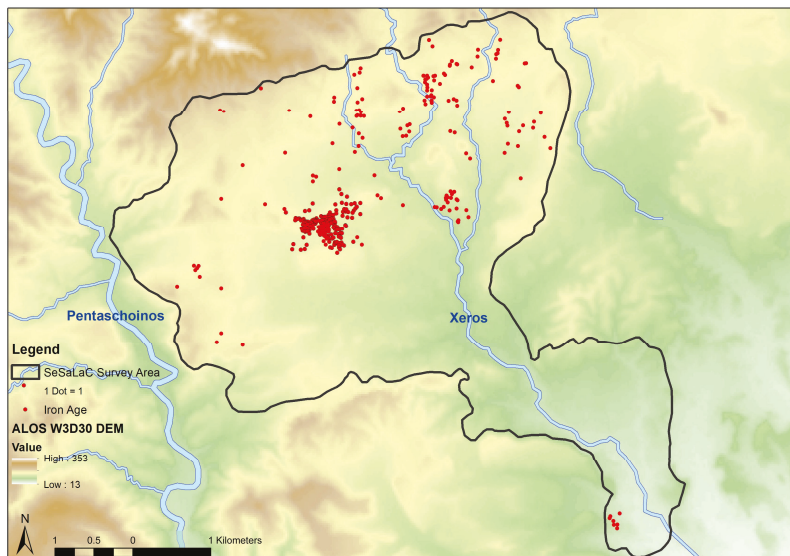


Figure 13. Cypro-Achaic and Cypro-Classical pottery distribution. ALOS DEM are in metres. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).



Figure 14. Iron Age pottery and terracotta figurines from the site of Kophinou-Panagia in the Xeros River valley (Image by Athanasios K. Vionis).



Figure 15. A looted rock-cut tomb at the site of Kophinou-Panagia, most probably of the Iron Age (Image by Athanasios K. Vionis).

Future ceramic studies need to clarify the percentage of Cypro-Achaic and Cypro-Classical pottery in order to identify whether the Cypro-Classical settlement density, similarly to the Vasilikos valley for example [45] (pp. 99–103), [53] (pp. 129–158), is significantly reduced when compared to the Cypro-Achaic. Anna Georgiadou is currently working on altering the picture of the presence

of Classical pottery in the settlements of the south coast [54]. Still, based on the existing published evidence, we have to note that during the Cypro-Classical period, an apparent reduction in settlement activity is attested in the Vasilikos valley again. According to the surveyors, the valley seems to have reverted to a backwater of little significance [45] (p. 102), but this reduction remains unexplained. We anticipate that the archaeological surveys in the neighbouring Maroni River valley and in the Xeros, and perhaps a future field project in the region of Choirokoitia, will provide alternative explanations, especially as this minimal evidence in the Vasilikos valley is in complete contrast to the urban centre of Amathous, which has provided abundant evidence of political and economic power during the Cypro-Classical period [55] (pp. 208–290, with references).

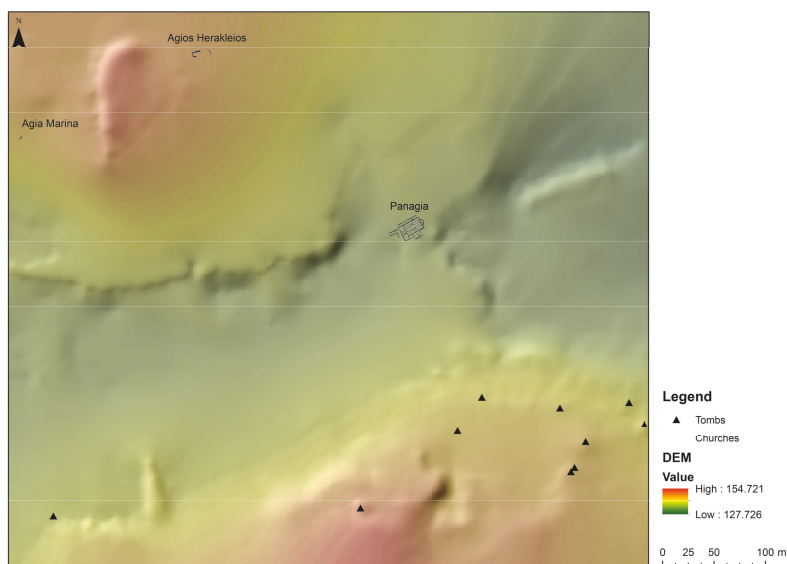


Figure 16. Group of rock-cut tombs at the south edge of Kophinou-Panagia (Map by Niki Kyriakou).

Our surface survey throws further light on much-debated issues in the current scholarship relating to the Cypriot city-kingdom polities as ‘central places’ and their economic ‘un-central’ territories. Our research builds significantly on earlier studies of Cypriot regionalism and its association with an economic model of successful micro-regions [4,6,23,56,57]. The lower foothills of the Troodos Mountains from north of Amathous to the Kalavassos region are rich in copper ore deposits. The area between the Vasilikos and Maroni valleys seems to have belonged (at least most of the time) to the territory (or sphere of interest) of Amathous, based on the geographic, numismatic, and archaeological evidence [4] (p. 550, with references). The eastern area of the Troodos, from the upper Pentaschoinos River and north of Stavrovouni Mountain to Idalion, is also rich in copper deposits and appears to form a different geographic unit. Copper slag has been found at Mathiatis, Lythrodontas, Agia Varvara-Almyras, and Sia [57] (pp. 53–56), [58]. At Agia Varvara-Almyras, in particular, the entire process of copper extraction and smelting has been identified [59].

In the context of the Unlocking Sacred Landscapes of Cyprus (UnSaLa-CY) project, we have argued on several occasions that extra-urban sanctuaries may have played a significant role in the territorialisation (a process related to the control of the extra-urban space) of the various city-kingdoms [7] ([4] with earlier references), [60]. The sanctuary sites of Pyrga, Mathiatis, and Lythrodontas, should be associated with the destiny of the polities of Idalion and Kition. While Antoine Hermay, based on the natural landscape and later textual evidence, has assigned the

area east of Stavrovouni Mountain—just northeast of our survey area—(Figure 3) down to the sea, east of Mazotos, to the territory of Amathous [61] (pp. 25–26), Terence B. Mitford (again on the basis of later textual evidence) [62] (p. 1339) allocated the area lying east of the Pentaschoinos River to Kition. Elsewhere, the French team excavating Amathous, also suggests that Pentaschoinos was the natural boundary for the Amathousian territory [63] (p. 8). In this context, as mentioned above, we should note that Kition probably became the seat of a city-kingdom only in the Cypro-Classical period [6] (pp. 33–34, with references). The texts cited by Hermary, including the Roman geographer Claudius Ptolemy and later Byzantine and Medieval sources, should be considered with caution as there are several problems behind their interpretation: some of these texts refer to Mount Olympus (identified with Stavrovouni) as attached to the city of Amathous, and the villages of Kophinou and Alaminos as attached to Limassol [61] (p. 26). In addition (even if this is again not unproblematic given that several pre-Kitchener maps of Cyprus are extremely inaccurate with several name corruptions), it is interesting to note that a map [61] (plate I) dating to 1718 and copying earlier maps showing the Roman military road network, refers to *Amathusia Regio* and to *Amathi Regnum* (Figure 17) [64] (p. 22); the cartographer carefully represents landmarks, including Mount Olympus and the boundaries of the *Amathusi Regnum*: these boundaries are clearly placed east of the Xeros River valley and Mount Olympus.

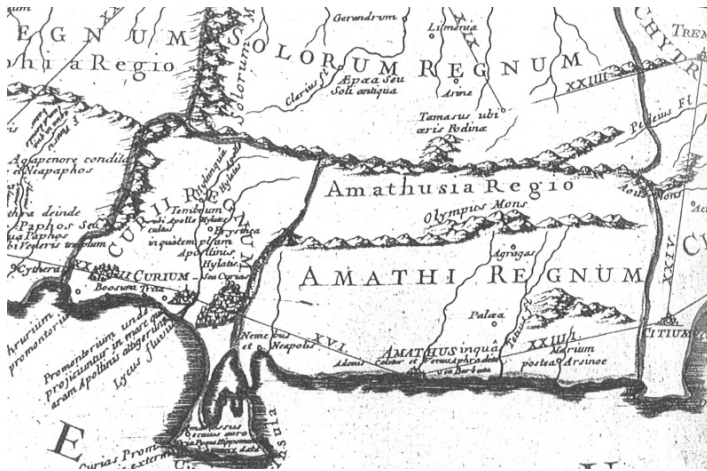


Figure 17. A map dating to 1718 but copying earlier maps showing the Roman military road network, referring to *Amathusia Regio* and to *Amathi Regnum* ([64] (p. 22, figure 16)).

As already mentioned above, the Xeros River valley is clearly located in a frontier zone between the polities of Amathous, Idalion, and Kition. Current trends in social anthropology and archaeology do not foster models that present human societies as stiff, static, and mechanistic; through the concept of materiality they refer to the ongoing dynamics of human and thing relations, avoiding conclusions about the history of a region or people by applying spatial distribution and culture-historical approaches of different territorially fixed cultures [65]. SeSaLaC explores alternatives to culture-historical approaches in an attempt to shift the focus from object-centre to actor-centred perspectives. We acknowledge that analytical networks are often traced on the basis of a shared material culture (same pottery shapes, styles, clays or raw materials), but this is not an unproblematic method. A preliminary study of the Cypro-Archaic and Cypro-Classical surface ceramics has demonstrated that about 95% of the sampled material is made of fabrics, shapes, and styles that are similar to the pottery found at the very centre of Amathous (personal communication with A. Georgiadou, Iron Age pottery specialist, who undertook a preliminary study of the material, 23 September 2018). Most of the recovered pottery demonstrates the stylistic and technical attributes of the Amathousian style;

in general, the Amathousian clay products, either terracotta figurines or pottery, display the same fabrics characterised by the presence of numerous tiny black inclusions of coastal sand from the (present-day) Limassol district [46] (pp. 95–96, with references).

The petrographic study of ceramic samples is still in progress, with the aim to explore and evaluate further the origin and distribution of the Cypro-Archaic and Cypro-Classical pottery based on macroscopic observation. Chemical analysis of surface pottery from different sites in the Xeros valley, using portable X-ray fluorescence spectroscopy (pXRF), however, reveals that all the Iron Age material from our survey area forms a homogeneous group, especially when compared with the Late Roman pottery (Figure 18). This suggests that the clay sources used in the Iron Age were very different from those exploited during Late Roman times; it should be noted here that a Late Roman pottery workshop site in our survey area in Xeros was discovered in the 2017 field-season (see below). Furthermore, as seen in Figure 18, the Iron Age decorated wares, which clearly correspond to the Amathous regional style, fall within the same physicochemical category as the undecorated wares, indicating that they were produced in workshops using the same clay sources. The Principal Component Analysis (PCA) of two groups of samples, i.e., our Iron Age surface pottery and contemporary ceramic samples from the palatial context of Amathous, groups the large majority of the fragments together (Figure 19). While these remain preliminary results, future work comparing the Xeros Iron Age pottery macroscopically and chemically with more samples from Amathous, Kition, and Idalion will further clarify the picture.

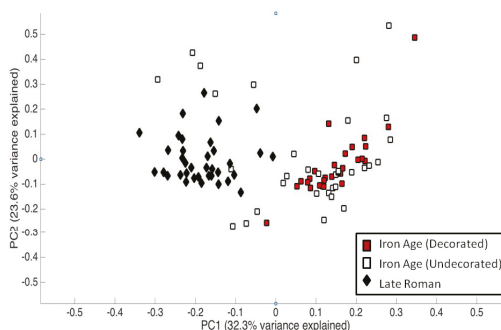


Figure 18. The pXRF and statistical analysis of Iron Age and Late Antique pottery from the Xeros River valley (Principal Component Analysis by Andreas Charalambous).

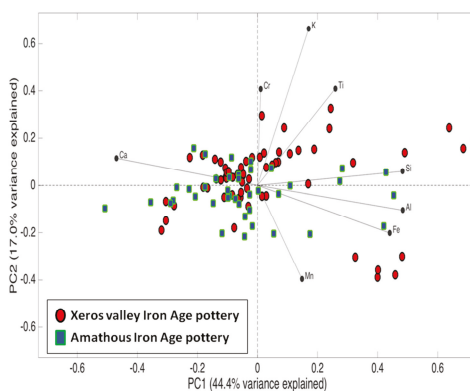


Figure 19. The pXRF and statistical analysis comparing the Xeros River valley Iron Age pottery with pottery from the palace of Amathous (Principal Component Analysis by Andreas Charalambous).

The preliminary pottery analyses (macroscopic and chemical) by the SeSaLaC team may reinforce Hermary's interpretation, suggesting that during the Cypro-Archaic and Cypro-Classical periods, the Amathousian territory may have extended well beyond the Pentaschoinos River towards Stavrovouni. The archaeological data may thus be in conflict with David W. Rupp's 1987 problematic Thiessen polygons [66], reproduced in the following years by many scholars of Cypriot archaeology (cf. [4] for a critique), and which associate the Xeros valley with the territories of Idalion and Kition. On the other hand, we accept that regional variation is a common phenomenon in the production of objects, but its presence should not necessarily be associated with political or even clear-cut cultural boundaries. Artistic and pottery production in Iron Age Cyprus seems to have been organised in highly localised workshops. Localisation in production, however, is largely determined by geography and geology. We should probably primarily associate the regional styles with material availability, technological considerations, and workshops' spheres of influence rather than with clear-cut political entities or domination [55] (p. 106).

The cultural unity of the city-kingdoms in Cyprus seems to rely on a multi-layered composition of regional variability created by inter-regional influences, while the stylistic (at least) comparison with the Amathousian production has to be viewed *vis-à-vis* to other material culture indicators, epigraphic sources, and topographical features discussed above, to further clarify the picture [4]. Georgiadou, looking closely at the ceramic fabrics, shapes and decorative techniques from the Vasilikos River valley, suggests that the homogeneous pottery from the valley, in comparison to that from the centre of Amathous, illustrates a case for the definition of these workshops, including "aspects of controlled and centralised organisation of the pottery production directed from the capital" [46] (p. 105). Should we refer to pottery production or the simple trade (of pottery or via pottery) directed from the capital? Based on the above discussion and the existing evidence, we cannot yet be conclusive on the above, or on the mode of circulation of Iron Age pottery in the Amathousian territory (and Cyprus in general), but we hope that the SeSaLaC Xeros River valley project will shed more light on this complex methodological issue.

The extensive survey we undertook on the hills surrounding the Xeros valley has produced no evidence for the existence of a Cypro-Archaic or Cypro-Classical sanctuary. Considering the long distance and the density of sanctuary sites elsewhere on the island, it remains a paradox that no definite sanctuary sites appear in the bibliography concerning the broader region between Maroni and ancient Kition [60] (p. 35, figures 1 and 2). We have identified a small number of terracotta figurines and a limestone statuette (that we provisionally dated to the sixth or fifth century BC) commonly found also in sanctuaries (Figure 20) (cf. [67] (p. 265, no. 539)) but, in any case, the concentration of evidence does not allow us to suggest the presence of a possible sanctuary [55] (pp. 373–375). It is probable that these figurines were originally deposited in a tomb or even a household, while (in rare instances when we have a context) such a limestone statuette has also been found in a tomb in the very centre of Amathous [68] (p. 19, no. 6). In addition, more male statuettes of this type have also been found in Amathous, one at the locality of Vikles and the other in the context of the Amathousian palace within the metallurgical workshops which were also related with a 'palatial sanctuary' [69] (p. 128, nos. 845, 847). While this may be coincidental, it is important to note that our own statuette was found in the same plots as the aforementioned slag concentration.

While we do not consider elevation as a defining characteristic of frontier sanctuaries, when we look for frontier sanctuaries outside the Mesaoria plain, elevation may have indeed played a significant role. In sanctuaries like Vavla-Kapsalaes, Ipsonas-Agios Sylas, and Kato Platres-Kambos tou Koulourou, just to mention a few, where evidence for the segmentation of space, consumption of food and drink (suggesting their role as a meeting space), large-scale storage and display, and the disposal of votive images (probably related to the elite or the royal) has been found, we have enough evidence to suggest that these places may have functioned as a frontier sanctuary [4] (p. 570) (cf. [70]). All these sanctuaries are located on elevated ridges. While our ongoing extensive surface survey on the cliffs surrounding the Xeros valley has not identified an ancient sanctuary so far, tradition (since

the Middle Ages) implies that the Stavrovouni Mountain, the highest mountain in the area, may have once hosted a sanctuary [71] (p. 441), [72] (p. 428), [73], [74] (pp. 13–17). There is limited evidence for a possible sanctuary (or more) in the broader Stavrovouni region, but the orientation of these sites (although orientation alone is not a safe criterion to allocate a sanctuary to a territory [4]) towards Pyrga [58], along with the aforementioned geographical description, may relate these sites primarily with Idalion or Kition.



Figure 20. A limestone statuette found in the Xeros River valley (Image by Charalambos Paraskeva).

2.5. Hellenistic and Roman Periods

Settlement activity, represented by a hamlet-site at the location of Kophinou-Panagia together with a number of satellite farms, continues throughout Hellenistic (ca. 310–30 BC) and Roman (ca. 30 BC–330 AD) times, despite the fact that the archaeological material is visibly reduced (Figure 21). However, this image may alter (even if not significantly considering our preliminary examination of the material) as the material from the southern part of the valley remains to be dated. The transformation of Hellenistic political topographies and the passing of Cyprus from segmented to unitary, colonial administration under a foreign general (the Ptolemaic *strategos*) brought a marked urban and extra-urban change [55,75]. The gravitation of people towards coastal cities was of greater historical significance. Several archaeological surveys on the island have noted a busy Hellenistic and early Roman countryside, followed by a general contraction from the second through the fourth centuries AD [7] (with references) [76] (with references). Evidence of Severan prosperity, which is often taken to represent the apogee of Roman Cyprus, is overwhelmingly urban and may have come about at the expense of the countryside [76]. Although we also recorded a lower density of archaeological

material dated to the Hellenistic and Roman periods in the Xeros valley, we cannot observe any major transformations in land use patterns.

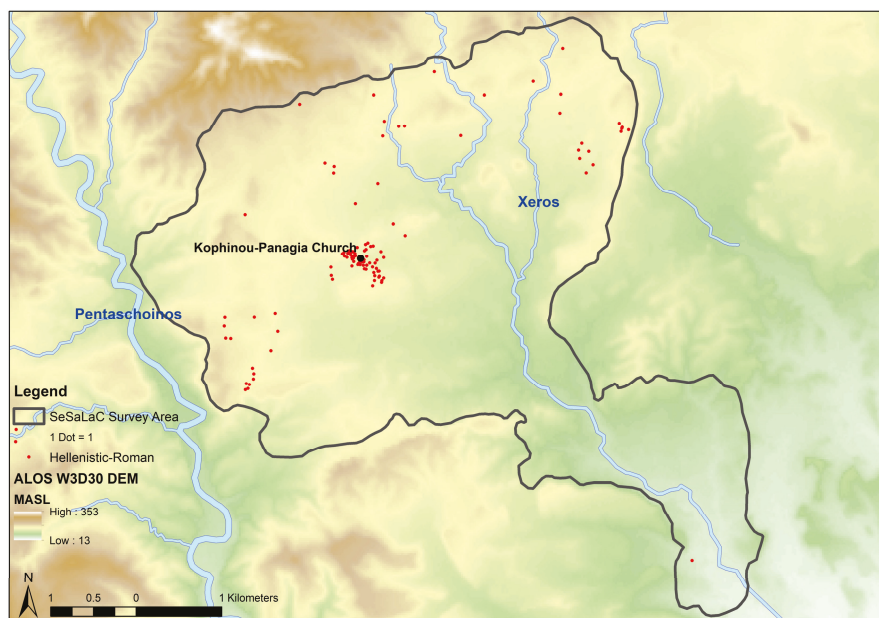


Figure 21. Hellenistic and Roman pottery distribution. ALOS DEM are in metres. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).

2.6. Late Antiquity

By the middle fourth century AD, the social transformations taking place throughout the Eastern Mediterranean led to gradual changes in the urban centres and in the countryside. Settlements and new cult sites dating to the fifth century AD, like the basilicas at Karpasia, Lapithos, Tremithous, and Yialousa, document both the expansion of rural settlements and the successful Christianisation of the countryside [76]. At the very centre of our research area, excavations revealed the foundations of a three-aisled basilica of the sixth or early seventh century AD, upon the central aisle of which the eleventh-century AD church of Panagia was erected. The distribution of Late Antique pottery at the site gives the impression of a thriving rural establishment of some 13 ha in size (Figure 22). Overall, Late Antiquity (ca. 330–650 AD) occupies the greater percentage of the total dated pottery (to this moment) in the Xeros valley assemblage (Figure 23).

It is also striking that three quarters of the Kophinou ceramic assemblage represent tiles, transport jars and large pithoi (such large and heavy vessels, when broken, produce a smaller number of fragments when compared to the fragile fine tableware), made of similar-looking clays, and intended for everyday household use (Figure 24). This does not come as a surprise; as also noted above, we have identified a large Late Antique ceramic workshop 2 km northeast of Kophinou and next to the river (Figure 2), through an overwhelming concentration of wasters, overfired pottery and kiln furniture (Figure 25). The workshop, in proximity to the river, the Roman road-network of the island, and the coast, produced almost every class of domestic ceramics, from roof-tiles and water pipes, to pithoi, smaller storage and transport jars, jugs and basins, as evidenced by the wide range of forms represented in the assemblage of overfired and misshaped vessels. This is a unique find for the period in Cypriot archaeology.

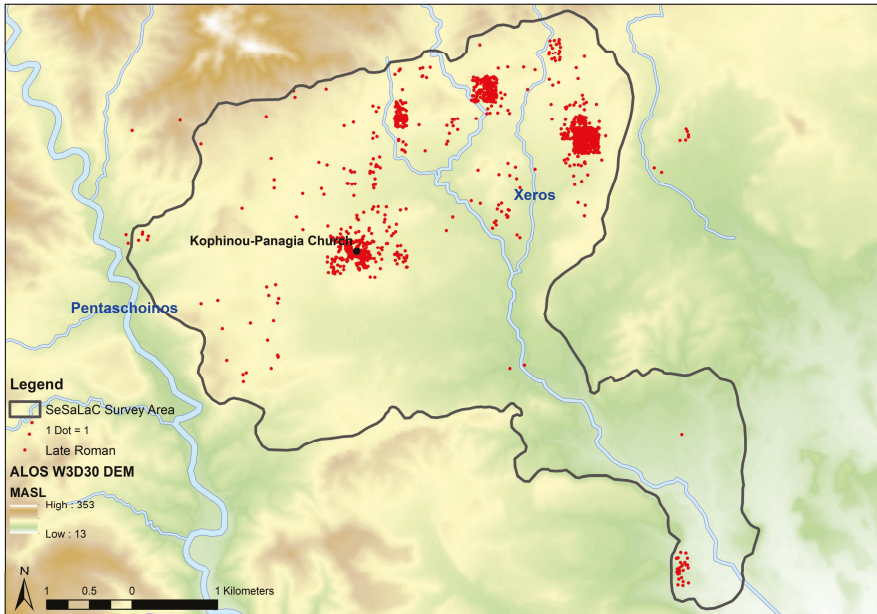


Figure 22. Late Antique (Late Roman) pottery distribution. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (Map by Charalambos Paraskeva).

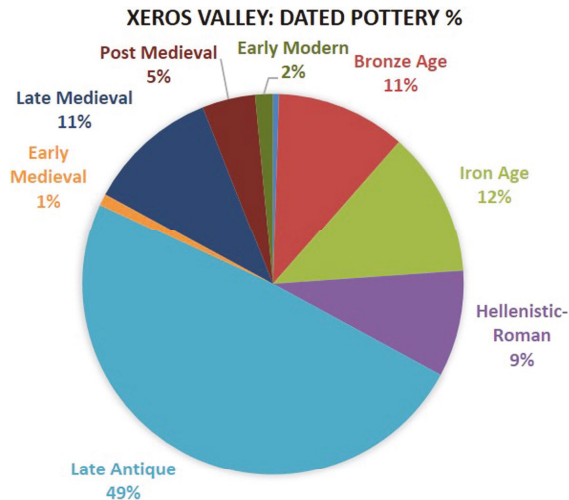


Figure 23. The percentages of dated pottery from sites in the Xeros River valley (Graph by Athanasios K. Vionis).

The ceramic evidence, the presence of monuments of Christian worship, topographic parameters, an extensive surrounding agricultural territory and comparative evidence from other excavated and surveyed sites suggest that in Late Antiquity the site of Kophinou played a central role within its ‘settlement chamber’, overlapping with our survey area. The extent of the site suggests that the settlement should have accommodated approximately 250 families during its maximum size in the

sixth and seventh centuries AD. The excavated basilica functioned as the focal point of the settlement, standing at its approximate centre, and dominating its immediate environs.

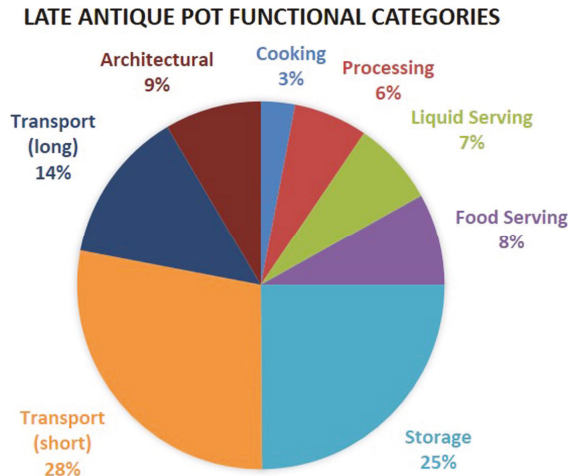


Figure 24. The functional categories of Late Antique (Late Roman) pottery from sites in the Xeros River valley (Graph by Athanasios K. Vionis).



Figure 25. Kiln furniture and wasters from the Late Antique (Late Roman) pottery workshop in the Xeros River valley (Image by Athanasios K. Vionis).

As we have extensively argued elsewhere [7,77,78], considering central place theory, Kophinou functioned as a second-rank settlement, and as the main habitation site of the micro-region of the Xeros River valley in Late Antiquity. Such secondary settlements in the countryside had a major role to play as local centres, that is, as important loci within the territory of their ‘settlement chamber’, acquiring an important role in agricultural production, processing, and distribution of goods. Part of an unusual type (in the case of Cyprus at least) (cf. [79,80]) of a probable olive-press system may date to Late Antiquity (Figure 26). GIS analyses, such as Viewshed and Cost-Surface, support the idea of the centrality of the largest of settlement-sites in the region, at the centre of the settlement-chamber of

the Xeros River valley (Figures 27 and 28). Thus, Kophinou could be defined here as an ‘agro-town’, fitting into an adaptive agricultural and economic system, subject to the pressure of international markets and changing balances between arable and pastoral lands. This new interpretation finds fertile ground in the full landscapes of Late Antique Cyprus and other places in the Eastern Mediterranean, within a ‘global’ superstructure as the Eastern Roman Empire [81].



Figure 26. A probable olive press found in a Late Antique hamlet-site in the Xeros River valley (Image by Athanasios K. Vionis).

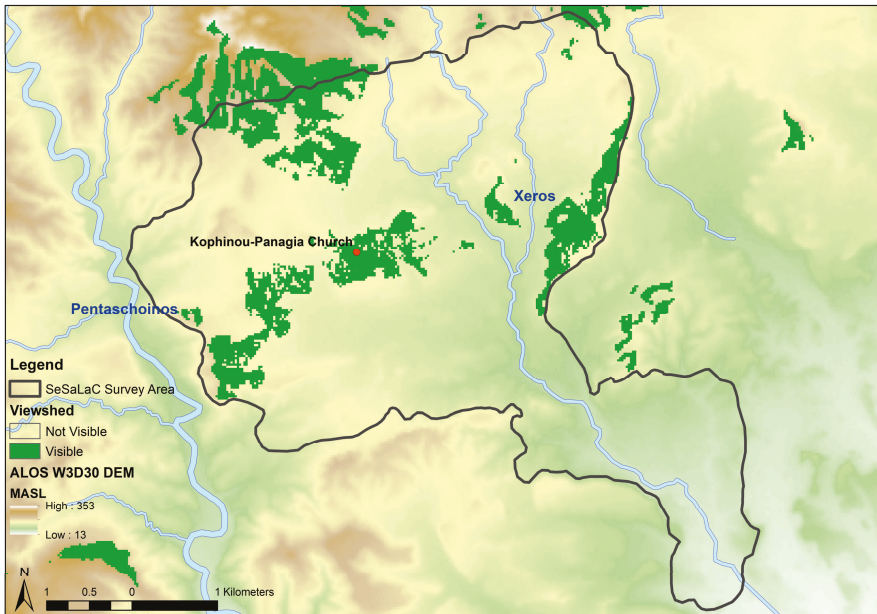


Figure 27. Viewshed Analysis from the Late Antique site of Kophinou-Panagia at the centre of the Xeros River valley. To create the Viewshed (at 1.8 m above ground), certain factors (such as the potential existence of tall trees and high buildings) cannot be taken into account due to the lack of evidence for pre-modern vegetation and land-use. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (GIS analysis by Charalambos Paraskeva).

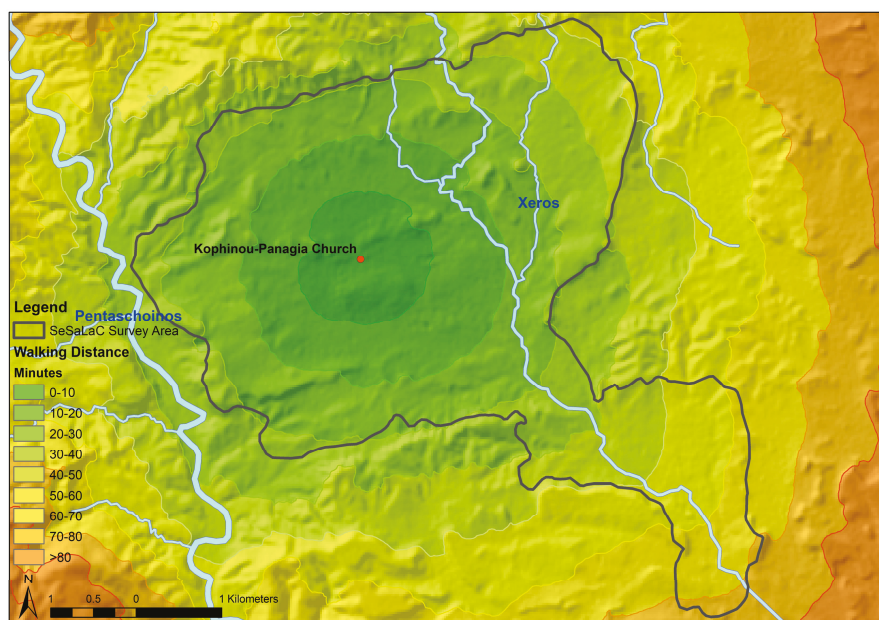


Figure 28. Cost Surface Analysis from the Late Antique site of Kophinou-Panagia at the centre of the Xeros River valley. Digital data courtesy of the Geological Survey Department, Republic of Cyprus (GIS analysis by Charalambos Paraskeva).

3. Conclusions

Concluding, we hope that we have managed to manifest how surface survey and landscape archaeology can provide a fresh perspective and a powerful investigative tool to address research questions related to the conscious and the unconscious shaping of the land and the processes of organising space, involving interaction between the physical environment and human presence in the *longue durée*. The changing social and material worlds of a large population living in the countryside has received less attention, but regional surface surveys can illustrate that the centrality of a place can be seen as the result of inter-reliant socio-political processes relating to natural environment, on different spatial scales, ranging from the local to the supra-regional [82]. The consideration of political geography and political economies play a significant role in any discussion concerning the development of settlement patterns. Regional surface surveys offer bottom-up perspectives on these political economies, offering at the same time diachronic configurations of patterns of habitation.

Un-central landscapes such as the Xeros River valley, surrounding the coastal and inland towns, conditioned the increasing wealth and power of central authorities (such as the Iron Age polities or the Late Antique bishoprics) through the management of agro-pastoral goods and metal resources (cf. [6,7,83]). These un-central landscapes, whose settlement network and land-use practices are increasingly recorded through a number of recent and ongoing surface survey projects, provide a rich source of material for investigating political economies, settlement organisation, and social transformations diachronically (cf. [84]).

Waterways had a prominent role in shaping the settled landscapes of southeast Cyprus diachronically [9]. Examining the Xeros River valley from the perspective of political economy and natural resources, we attempted to show how an ‘un-central landscape’ may have functioned as a place of economic or ideological centrality. The Xeros River clearly acted as an economic asset in making this ‘un-central’ landscape central, diachronically. Water procurement and management seem

to have determined the clear tendency for settlement along the main Xeros River and the small valleys formed by its streams from prehistory to Late Antiquity, always at a safe distance from the water to avoid the risk of flooding (cf. [85]).

Water and rivers are understood to have specific powers and agencies related both to life and destruction [11,86]. The management of riverine water, such as the cases of Ottoman watermills both in the Xeros and the nearby Pentaschoinos valleys for example (Figure 29), should be scaled at the level of its associated communities and environments. Rivers, incorporated into social and ecological developments, were particularly vibrant elements in periods of economic crisis, stability and growth.



Figure 29. A Late Ottoman watermill outside the present-day village of Alaminos in the Xeros River valley (Image by Athanasios K. Vionis).

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Article

Shifting Centres: Site Location and Resource Procurement on the North Coast of Cyprus over the *Longue Durée* of the Prehistoric Bronze Age

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Abstract: This paper examines the relationship between site location, resource procurement, and political economy in the context of three localised centres of settlement—Vasilia, Vounous, and Lapithos—which succeeded each other in the narrow, naturally bounded north coastal strip of Cyprus during the approximately 750 years of the Early and Middle Bronze Age (ca. 2450–1700 BC). Cyprus is home to abundant copper sulphide ores and was linked to the international metal trade in the first phase of the Early Bronze Age and again in the Middle Bronze Age. In both cases, this was conducted largely, if not exclusively, via outlets on the north coast which lie close to the southern coast of Anatolia and contemporary shipping lanes but some 35–40 km distant from the nearest ore bodies in the foothills of the Troodos Mountains. Mechanisms which allowed north coast sites to overcome internal distance deterrents in order to exploit geostrategic advantages in relation to external trade include a favourable natural environment (rainfall, soils, and harbours), technological advantage, probably coercion (physical and ideological), and an ability to achieve high levels of centrality within communication and transport networks with fluctuating levels of integration and hierarchy.

Keywords: Cyprus; Bronze Age; site location; resource procurement; metals trade; political economy; connectivity; central places; central flow theory; nodal points

1. Introduction

This paper aims to examine the relationship between site location, resource procurement, and political economy in the context of three localised centres of settlement—Vasilia, Vounous, and Lapithos—in the narrow, naturally bounded north coastal strip of Cyprus during the approximately 750 years of the Early and Middle Bronze Age (ca. 2450–1700 BC) (Figure 1). Space enters into economic relationships through the usually uneven distribution of natural resources and the distance separating economic activities [1] (p. 1). Both are critical to understanding the north coast of Cyprus, especially in relation to the first and third of our settlements. The north coast played a major role in the development of Bronze Age society in Cyprus. What happened in this region, however, was as much a case of overcoming locational disadvantage, as of exploiting advantages to create central places in an uncentral landscape that achieved considerable success within and beyond their micro-region. This was not a straightforward process. It did not follow a unilineal pathway and it did not progress to urbanisation. The ultimate demise of this evolutionary trajectory appears to reflect shifts in market demand in the wider eastern Mediterranean, emphasising the critical importance of off-island and inter-regional connectivity to the economic success of these settlements.

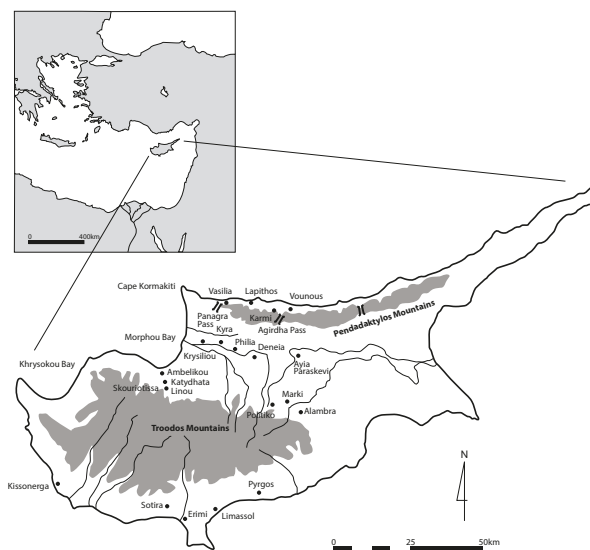


Figure 1. Map of Cyprus showing the location of the island within the Eastern Mediterranean and the main sites mentioned in the text.

The mining, processing, and movement of Cypriot copper will be a key focus of this paper. The sulphide ores, which are locally abundant in the pillow lavas that surround the Troodos Mountains in the central west of the island, were mined from at least the beginning of the Early Bronze Age (EBA). With several exceptions, the distance between ore bodies and potential coastal outlets is such that mechanisms for long-distance procurement must have been in place before an export trade in Cypriot copper could begin. Yet, several lines of evidence suggest that Cyprus was linked into the international metals trade in the first phase of the EBA, referred to as the Philia Early Cypriot period (Philia EC), and again in the Middle Bronze Age (MBA) or Middle Cypriot (MC) period (Table 1). In both cases, this external trade appears to have been conducted largely, if not exclusively, via outlets on the north coast which lie some 35–40 km from the nearest ore bodies.

Table 1. Approximate chronological schema for the Early and Middle Bronze Ages in Cyprus (for recent discussions see [2–4]).

	Approximate Dates Cal BC
Philia Early Cypriot (Philia EC)	2500/2450–2250/2200
Early Cypriot (EC) I–III	2250/2200–2000/1950
Middle Cypriot (MC) I–III	2000/1950–1680/1650

This gives rise to the questions that are the central concern of this paper. How were north coast communities articulated with those in the procurement zone (i.e., mining communities), along transportation and communication routes, and at trans-shipment points? Did these inter-regional economic transfers take place within a network or networks that were hierarchical, top-down, and coercive, or between mutually benefiting, self-interested individuals and groups? How much mobility, autonomy, and connectivity did they involve?

In attempting to answer these questions, the deficiencies of the archaeological record must be acknowledged. First and foremost, while there is a wealth of mortuary data, there are almost no excavated settlements in the regions of greatest interest; in addition, since the Turkish invasion of

Cyprus in 1974, the northern part of the island has not been under the control of the Republic of Cyprus, creating a four-decade hiatus in fieldwork in this area [5]. The recent publication of several pre-1974 excavations in the occupied area, however, including that of a mining settlement, have provided new data [6,7], and excavations since 1974 in other parts of the island continue to illuminate broader socio-economic trajectories [8,9]. Petrographic and chemical studies of ceramics [10–12] and compositional and lead isotope analyses of EBA and MBA metal assemblages from the north coast [13–15] are also adding significantly to our understanding of intra-island connections and the extent to which the north coast was involved in the metals trade.

2. The Physical Environment

Knitter et al. [16] (p. 4) identify five main factors that control the location of settlements: the availability of water, arable grazing land, and fuel and building materials (for the Cypriot context, see [17], [18] (pp. 80–81), [19] (pp. 264–294)). Nagle [20] (p. 6) adds freedom from flooding, level sites to build on, sunny south facing slopes, potential for trade, and commerce and defensibility to this list. On almost all counts, the environmental characteristics of the central north coast of Cyprus are likely to have been highly favourable to prehistoric (as to more recent) settlement (on the geology, environment, and natural resources of the north coast see [21] (pp. 199–201), [22], [23] (pp. 61–74, 248–256, 296)). The narrow coastal plain (Kyrenia Lowlands), which stretches for about 80 km from Panagra in the west to east of Kantara, is flat or gently inclined, with light alluvial soils [21] (p. 43). The richest springs on the island rise on the middle and lower slopes of the ‘vertical wall-like’ Pendadaktylos Range [21] (p. 10), which forms a formidable barrier between the north coast and the hinterland. Three widely spaced passes lead south to the Central Lowlands: the Panagra Pass, near Vasilia; the Agirdha Pass, above Vounous; and further east to the north of Lefkoniko (on the importance of the Panagra and Agirdha Passes in the EBA and MBA, see [24] (pp. 120–122)). The north coast lies within 100 km sailing distance of the southern coast of Anatolia (Figure 1, inset). While much of the coastline is rocky, there are small sheltered coves which would have provided serviceable anchorages for ancient shipping, like those known or presumed from such EBA Levantine sites as Byblos, Ugarit, and Sidon [25].

Much of Cyprus is semi-arid to arid and subject to periodic drought [21] (p. 28), [26] (pp. 19–24). While this is likely to have imposed significant constraints on population density in some areas, the north coast is less effected by fluctuations in rainfall [27] (pp. 27–28, Figure 3) [28], and the towns in this region have long been among the largest and most prosperous on the island. Lapithos, in particular, is ‘an exceptionally favoured locality’ [29] (p. 74) with perennial flow irrigation allowing intensive land use and relatively high population density [21] (pp. 59, 63, 118, 199, Figures 41, 60, 62a, 87). The spring at Lapithos Vrysi tou Barba, which is one of the most copious on the island, outlets in a deep semicircular cove, potentially offering ancient shipping a source of freshwater as well as a safe anchorage. Lapithos is also known for the quality of its clays and building stone and offers several uniquely defensible plateaus at Kastros and Ayia Anastasia [30] (pp. 21–22, Figures 1.2–1.3, 1.17–1.18, and 1.22), one or both of which may have been a focus of settlement during the Bronze Age (Figure 2).

The north coastal strip is, however, nowhere wider than 5 km (Figure 3). This is likely to have inhibited the longer-term potential for population growth and systems elaboration in favour of sites with larger sustaining areas [31] (p. 32, n. 19). Other disadvantages of the north coast include its physical isolation behind the precipitous slopes of the Pendadaktylos Range, its distance from the island’s copper sources and the need to control the passes that are the only overland routes south to the Central Lowlands. It is clear, however, that the geostrategic importance of the north coast, i.e., its proximity to an inter-regional maritime trade network which stretched between the Levantine coast and the Aegean basin via the southern Anatolian coast in the third and early second millennia (see, most recently, [32] (pp. 78–79, Figure 14)), was of paramount importance; and that mechanisms were in place that enabled north coast communities to overcome these disadvantages at least during the Philia EC and MBA.

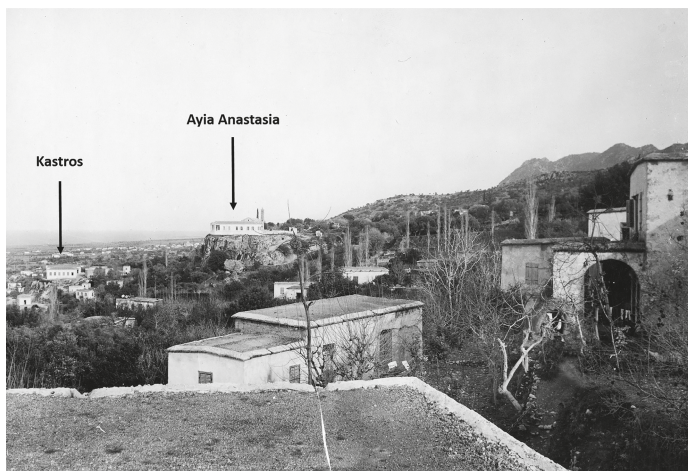


Figure 2. View of Lapithos village from the west, showing the plateaus of Kastros and Ayia Anastasia (© Medelhavsmuseet, Stockholm C06274). Photo taken in 1927.



Figure 3. View of the north coastal strip from the south, with Lapithos village in the foreground (© Medelhavsmuseet, Stockholm C00936). Photo taken in 1927.

3. Vasilia, Vounous, and Lapithos

Three major sites on the north coast will be considered as possible examples of the development of economic and political centrality in prehistoric Bronze Age Cyprus—Vasilia, Vounous, and Lapithos (Figure 4). All are situated in favourable locations within their natural region and two are among the few coastal settlements known on the island at this time. Vasilia was occupied in the Philia EC, Vounous from the following EC I period to MC II and Lapithos from EC II until MC III (see Table 1).

All three appear to have been large settlements with significant political, economic, and ideological authority at both the local and inter-regional level, operating in succession or, in the case of Vounous and Lapithos, as rivals in the narrow coastal strip.

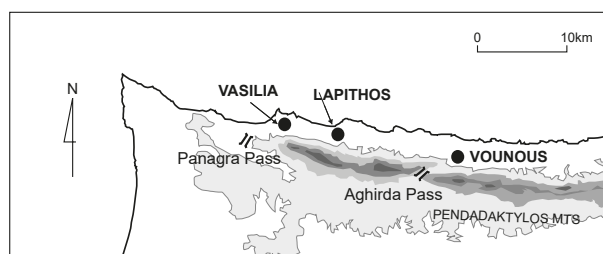


Figure 4. The central north coast of Cyprus showing the location of Vasilia, Lapithos, and Vounous.

3.1. Vasilia

It is now widely accepted that the Bronze Age in Cyprus was initiated by some population movement from Anatolia ca. 2450 BC, although the processes involved and the nature of interaction with local Chalcolithic communities continue to be matters of debate (see, most recently, [3], [27] (pp. 24–25), [33] (pp. 263–277), [34] (pp. 344–346), [35]). Copper is likely to have provided a major incentive for this movement, in particular a desire to find new sources of metal to feed into the prestige goods networks that linked southeast Anatolia to the northeast Aegean, the Cyclades, and mainland Greece in the early to mid-third millennium [32,36,37]. This move to Cyprus resulted in the first systematic exploitation of the island’s copper resources. Metallurgical technologies introduced at this time include the smelting of sulphide and polymetallic ores and the use of arsenical copper alloys [33] (pp. 300–301), [38] (p. 7), [39] (pp. 232–233), [40] (p. 63).

The importance of the north coast in the first phase of the EBA, the Philia EC, is well-known and it is likely that it was the initial point of entry for incoming groups. Vasilia, located northeast of the Panagra Pass and in command of an ‘excellent harbour for primitive craft’ [41] (p. 297), was clearly a major settlement. While it remains unexplored, surface indications and the great extent of associated burial grounds suggest it was of considerable size [24] (pp. 116–117), [42] (p. 25), [43] (pp. 180–182), [44] (pp. 206–210, Table 10). Similarly, the elaborate construction of several chamber tombs contrasts sharply with the majority of small pit tombs, suggesting considerable socioeconomic inequality [40] (pp. 61–64), [42] (pp. 25–39).

Philia EC sites were founded across the island (Figure 5) near ore bodies and on communication and transport routes [45] (for a more circumscribed Philia network, see [46]). They shared a remarkably homogeneous material culture, and recent analyses of pottery clays suggest that most of the finer vessels were distributed from a production centre or centres in the north, perhaps in a reciprocal exchange with copper producing areas [10,11]. The recovery of a casting mould at Marki in the Central Lowlands [47] (pp. 216–217, Figure 6.7, pl. 57) leaves no doubt that one or more ore bodies in the northeast Troodos were being mined at this time and an arsenical copper dagger-ingot from Sotira suggests the exploitation of ore bodies in the Limassol area [48] (pp. 391–392). A Philia EC presence at Phlasou in the vicinity of the major ore bodies at Skouriotissa in the northwest Troodos is also possible [49] (pp. 70–78). Settlements in the Ovgos Valley, at Khrysiliou, Kyra, Philia, and Deneia, formed a major communication route linked with Vasilia via the passes at Panagra and Agirdha. Prominent individuals (‘central persons’) at Vasilia are likely to have played a key role in promoting these internal networks and to be the same individuals reflected in the remarkable funerary record that is currently unique to this site.

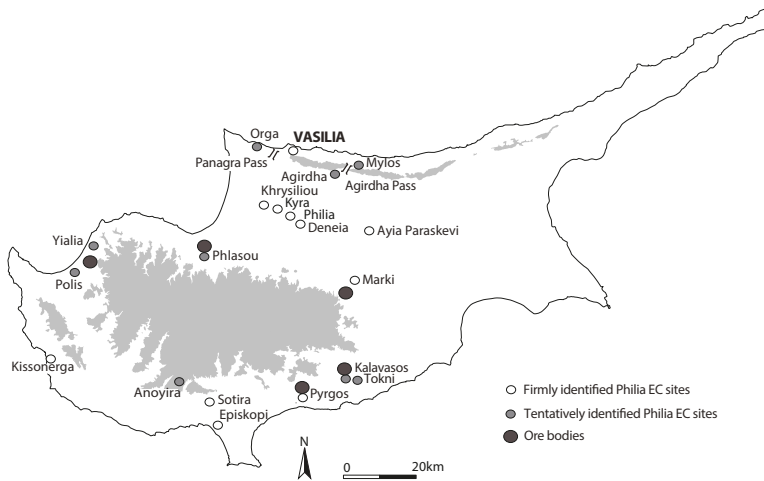


Figure 5. Map of Cyprus showing Philia EC sites.

3.2. Vounous

Settlement at Vasilias ceased, possibly abruptly, around 2250/2200 BC [44] (pp. 206–210, 443, Table 10.10), [50] (pp. 277–281). Its demise coincides with a major disruption to Cyprus' external connections. This is likely to have been brought about by the collapse of the eastern Mediterranean interaction system—perhaps as a result of environmental degradation associated with a severe drought (see, most recently, papers in [51]; for the Cypriot context see [3] (p. 1), [8] (pp. 62–63), [27] (p. 27)).

Following the demise of Vasilias, Vounous, 20 km to the east and 2.5 km inland, became the paramount centre on the north coast. Once again, the settlement remains unknown, but 164 tomb complexes have been excavated in two cemeteries (Sites A and B) [52–54]. The tomb assemblages, particularly those of EC I–II date at Site A, show a distinctive ceramic tradition, with high artefact diversity, a rich, diverse array of forms, and a complex iconography [8,55–57]. There is a focus on elaboration, visual symbolism, individualising vessels (drinking cups), and ritual forms, and evidence for ongoing ritual activity in some tombs. This suggests that pottery, tomb elaboration, and mortuary feasting were used in a fluid system of status negotiation and that ancestral relationships were particularly important in the formation and legitimization of authority at Vounous [58] (pp. 37–83), [59] (see also [57,60], [61] (pp. 159–160), [62] (pp. 139–142), [63] (pp. 84–87)). This may reflect a more-or-less direct evolution on the north coast from the earlier Philia EC system—which had been founded on economic centrality and the management of cross-island networks—to one in which status and authority were structured in ways which appealed instead to ritual legitimacy and the elaboration of a highly localised material culture.

North coast pottery occasionally moved south to settlements like Marki [47] (pp. 110–112, 119), where stone moulds indicate continued production of copper ingots in EC I–II, and west as far as Kissonerga [64]; and a few vessels from the south found their way to the north coast [65]. These cross-regional imports, along with hybrid ceramic forms at Katydhata [66] (p. 134), indicate a degree of interaction between the north coast, northwest Troodos, and Central Lowlands, perhaps involving a trade in ingots or metal artefacts. The sharp stylistic boundaries which are visible, however, in material culture, most obviously in the form of ceramic style-zones (Figure 6), suggest the existence of relatively circumscribed networks at this time with the Pendadakytylos serving as a significant physical boundary [8], [46] (pp. 461–463), [56], [67] (p. 219).

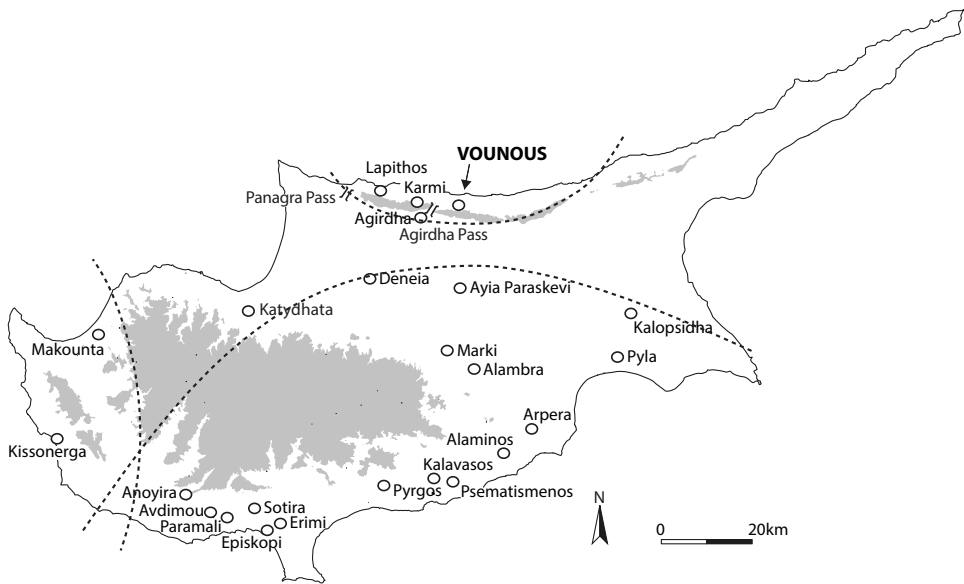


Figure 6. Map of Cyprus showing EC I–II sites and ceramic style zones (bordered by dotted lines).

3.3. Vounous and Lapithos

Lapithos lies on the coast midway between the Panagra and Agirdha Passes and ca. 17 km west of Vounous. Like Vounous, the settlement or settlements here remain unknown but 166 tombs have been excavated at the localities of Vrysi tou Barba and Sotira and in the modern town. While only 25 tombs (and one additional chamber) have been published [68] (pp. 32–162), [69], a comprehensive report on another 38 is available as an unpublished dissertation [70] (see also [71]), and preliminary reports, archival records, and my own ongoing research allow some discussion of the remainder [9], [29] (pp. 78–85), [72] (pp. 73–83), [73] (p. 521), [74] (pp. 469–472), [75].

The burial data and surface indications suggest a densely occupied landscape (Figure 7). Indeed, for the MC period, as many as 12 burial and settlement locales have been identified in the vicinity of the modern village [44] (pp. 215–219, nos 43–54, Table 10.1), [75] (p. 57). This may be the result of population aggregation early in the MBA, a phenomenon evident also at this time at Deneia, a major site with close ties to Lapithos in the Ovgos Valley south of the Agirdha Pass [76] (pp. 159–161). Additional sites were also established in EC III or MC I at Vounous, Vasilia, Karavas, and Motides on the central north coast [44] (pp. 224–225, Table 10.1). These cluster around Lapithos and Vounous, with an 8 km gap or ‘buffer zone’ between them [44] (Figure 11.21), [75] (Figure 1a) (Figure 8). While their chronology and function remain unclear, their number and distribution suggest that, by the MBA, the territory of Lapithos was significantly larger than that of Vounous, extending east to Karavas and west to Vasilia.

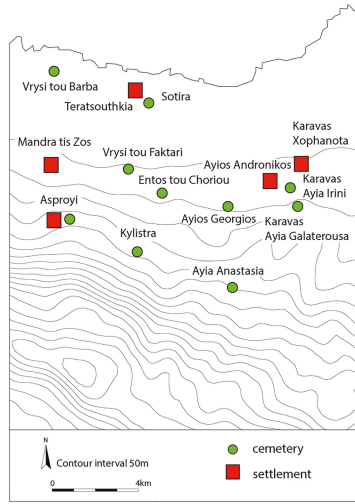


Figure 7. Settlement and cemetery sites in the vicinity of the modern village of Lapithos, as indicated by surface survey and limited excavations (after data collected by Georgiou [44]).

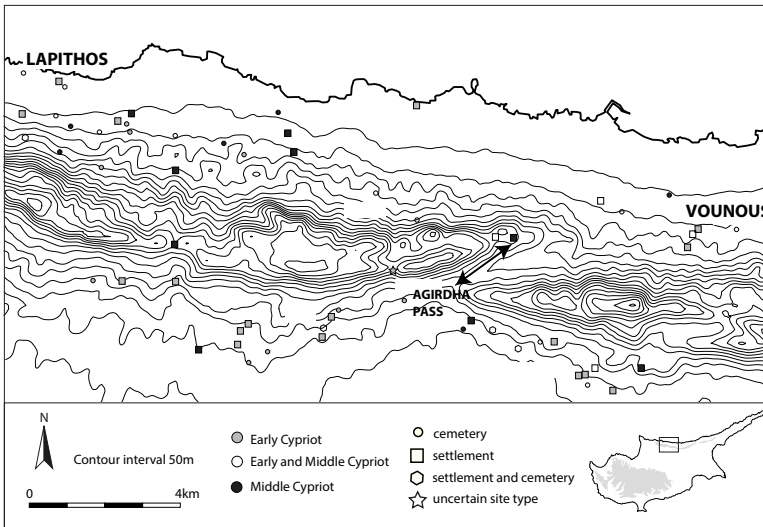


Figure 8. Settlement and cemetery sites in the vicinity of Lapithos and Vounous, as indicated by surface survey and limited excavations (after data collected by Georgiou [44]).

The earliest tombs at Lapithos date to EC II. The site, however, remained relatively small until EC III. At this point, Lapithos and Vounous are likely to have come into competition for land and other resources. The re-emergence of an external demand for Cypriot copper at the beginning of the MBA is also likely to have played a critical role, with Lapithos better placed to take advantage of this resurgence of seaborne trade. It appears to have become pre-eminent during MC I, by which time Vounous was in decline, with settlement ceasing here in late MC II. The shifting fortunes of these two sites are reflected in the relative quantity of metal deposited in the tombs (Figure 9). Metal is more common at Vounous in EC I–II (when it was the dominant site in the region), there is little difference

between the two sites in EC III–MC I (when they had reached a position of potential rivalry), metal grave goods then decrease significantly at Vounous and occur at Lapithos at remarkably high levels in MC I–II and MC II–III [58] (pp. 63–71, Tables 4.7a–c, 4.8, 4.9, 4.11a–c, 4.12, 4.15, Figures 4.4, 4.5), [59] (pp. 370–378, Figure 17, Table 12), [75] (Figure 1c).

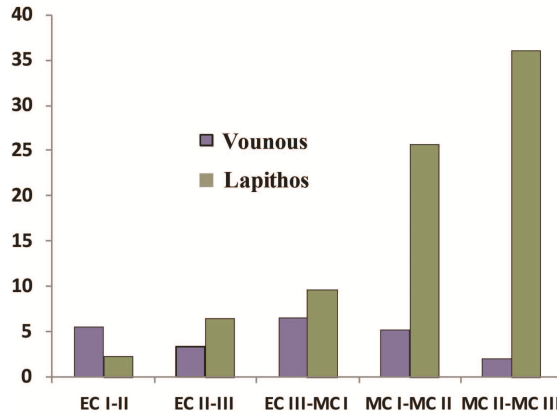


Figure 9. Metal objects as a percentage of the total burial assemblage at Vounous and Lapithos across five burial periods (numbers for Lapithos do not include objects excavated in 1913 and 1917).

The incidence of specific artefact types is also instructive. Spearheads occur in small numbers at Vounous and Lapithos prior to EC III, become far more common in EC III–MC I at both sites, and by MC II have disappeared almost entirely at Vounous but are increasingly common at Lapithos [75] (Figure 2a) (Figure 10 left, Figure 11). Similarly, knives are notably more common at Vounous up to and including EC III/MC I, their numbers then drop at Vounous, while at Lapithos they increase in frequency and size [75] (Figure 2b,e) (Figure 10 right). Both sets of data suggest that bladed weapons were plentiful on the north coast in EC III/MC I, a period of potential conflict between rival sites and territories. Indeed the concentration of weapons here is remarkable. Vounous and Lapithos account for 81.6% of all spearheads recovered from EC and MC tombs across the island [9] (p. 133, Figure 4), [77] (Table 9.1). Keswani [58] (p. 83) has argued that they were ceremonial objects used in mortuary display, but their presence coincides with the rise of Lapithos and the demise of Vounous, suggesting real conflict in this micro-region.

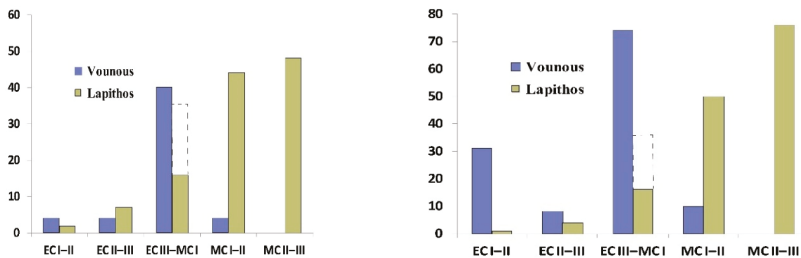


Figure 10. Number of spearheads (left) and daggers/knives (right) from Vounous and Lapithos recovered in tombs from EC I–II to MC III (the dotted line is an estimate of the number found in unpublished tombs at Lapithos Sotira).

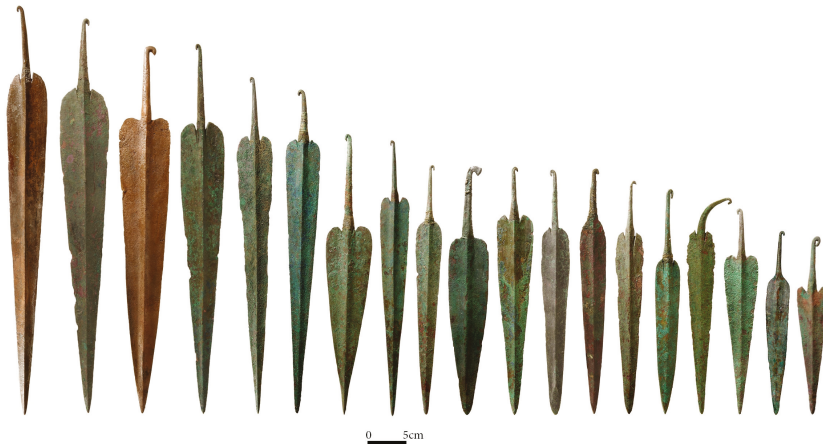


Figure 11. Copper-base spearheads from Lapithos. Photographs by Rudy Frank.

4. Beyond-Village Settlements

Views on the nature and significance of the settlements at Vasilia, Vounous, and Lapithos and the role, more broadly, of external trade and the copper industry in the emergence of complex social structures on Cyprus have fluctuated widely over the last half century. In the most recent discussion, Knapp [78] (also [79] (pp. 113–117)) has refined his own earlier arguments [80,81], which traced the ‘incipient’ stages in the emergence of sociopolitical complexity to the EBA and MBA. While accepting that there are some material indicators of intensifying external contacts between 2000 and 1750/1700 BC, and that an intensified level of copper production at this time may have set the stage for the transformations apparent at the onset of the Late Bronze Age (LBA), he is now of the view that the material correlates of a stratified society do not appear before ca. 1700 BC, and that all associated developments, including increased mobility and connectivity, ‘took place within an archaeological moment of change around 1700 BC’ [78] (p. 21) (see also Knapp [79] (p. 114)). Copper, he argues, remained a scarce resource throughout the EBA and MBA, and the number of imported goods suggests that the people of this era were only passively involved in long-distance exchange, which was ‘sporadic rather than intensive and systematic’ [78] (pp. 24, 39).

There are two related issues of importance here. 1. The number of imports in Cyprus in the EBA and MBA, in particular on the north coast. 2. The extent to which north coast settlements were engaged in metal production and trade. Current evidence for both extends well beyond that utilised in previous studies.

4.1. The Question of Imports

Knapp [78] (p. 24), citing Keswani [58] (Table 4.11b–c), [59] (pp. 388–389, Table 13), [50,82], refers to a total of some 40 imports from Crete, the Levant, Anatolia, and Egypt from the whole island for the period from the Philia EC to the end of MC II (see also [79] (p. 114), where the number of imports is reported as ‘about 25’). This is a crude measure, which assigns equal weight to objects of different size, material, and origin and fails to take into account the limited extent of excavated deposits, the concentration of imports on the north coast, and fluctuations in external contacts over the prehistoric Bronze Age. It is also a significant underestimate.

Imports from the Philia EC period include three spearheads, a sword, two knives, two ring ingots, and an axe/axe-shaped ingot, which are either of non-Cypriot types and/or of non-Cypriot copper [47] (Table 5, nos 3–5, 8–9, 14), [83] (p. 245, Figure 3), [84] (p. 212, Table 11, 1957.22, 1957.24), a gold earring [42] (p. 26), two bowls, one with a diameter of 58cm, and a jug of calcite [42] (pp. 29,

32, nos 3, 4, Figures 48, 62d–63), [82] and two earrings of electrum [48] (pp. 391–392, as gold), [85] (pp. 376–379, M6, M7). Thirteen of these 15 imports come, certainly or probably, from a handful of looted tombs at Vasilia. Sherds and a possible jug of Cypriot Philia EC wares from EB II Tarsus attest to reciprocal connections between the north coast and the Anatolian mainland [86] (pp. 112–113, 128, 130, Figure 263.371–378), [87] (pp. 170–172, Figures 2–7), [88] (pp. 31, 33, n. 5). The appearance of isolated linear signs on an axe and chisel from Vasilia [89] (p. 170, nos 1867–1870) and a knife from Soli-Pompeiopolis on the Anatolian coast [90] (p. 187, Figure 4, pl. III) also suggests north coast participation in wider networks.

Six imported objects from 45 EC I–II tomb chambers at Vounous Site A—a Syro-Levantine jug, an object of sheet gold, and four pins [53] (pp. 237, 239, Tomb 164B.9, 40, pls XCIVa, CVIIIf), [91] (pp. 70, n. 1, 72, n. 3, Tombs 84 and 91)—are the only imports known on the island from this period. However, things changed radically toward the end of the EBA and in the MBA. Imports from Lapithos include 62 rings/earrings and two pins of lead, six rings/earrings, five pins, three bracelets, a diadem and a vessel of silver, 12 gold ornaments, at least 30 faience necklaces, comprising over 1170 beads, two faience pendants, three pottery vessels and five knives, three pins, two pairs of tweezers and a razor of copper/bronze [58] (Table 4.11b–c), [59] (Table 13), [68] (pp. 33–162), [69], [70] (pp. 802–804), [74] (pp. 471–472, CS 1693), [91] (pp. 62, 68, 69, 71), [92] (pp. 111–112, Figures 2, 3, pl. 25c–e), [93] (pp. 123, 125, ill. 1C), [94] (pp. 144, 153, 161, Figure 46). Further likely imports comprise a socketed hook, eight pins, and two spatulas of copper/bronze [91] (pp. 66, 71, Types 3a.3–5, 75, Figures 4.7, 5.11, pl. 2f), and an incised bone rod [70] (pp. 803–804). Other MBA imports on the north coast include two Syrian jars, a gold spiral, 13 faience beads, two knives, tweezers, and a pin from Vounous [52] (Figure 15, Tomb 15.75), [54] (pp. 61, 83, 116, 182, Tombs 59.9, 15, 64.106, 125, 68.1, 72.130), [91] (pp. 62, 69, 71, Tombs 12.74, 13.79, 19.89, 143.32), and a Middle Minoan II cup, and four faience beads from Karmi [6] (pp. 128, 155, 246–247, Figures 3.98, 3.105, 4.45).

While reducing this exercise to a numbers game is not without problems, and many of these objects are small personal items, it is nevertheless clear that there are many more imports from the north coast than previously reported: 13 from Vasilia, six from EC I–II Vounous, and some 150 certain and at least 12 likely imports from MBA tombs at Lapithos, Vounous, and Karmi. These figures do not include ‘hidden’ imports, which likely included horses [68] (p. 143) and possibly textiles. The evidence from Lapithos, in particular, suggests the import of weapons, jewellery, tools, and pins of copper/bronze, lead, and precious metals. The fact that these imports are matched by relatively limited evidence for Cypriot MBA pottery in the Aegean [95,96] and Anatolia [97] (pp. 314–315, Figure 228, nos 410–411) suggests, though it certainly does not confirm, that this was primarily a trade in metals which did not involve luxury ceramics or the movement of goods in ceramic containers.

This is not, however, the whole story. Lead isotope analyses (LIA) suggest that a significant amount of the copper found in locally produced objects from the north coast is of non-Cypriot origin. Indeed, eight of ten Philia EC copper-based artefacts from Vasilia which have been analysed to date have lead isotope signatures currently considered to be inconsistent with Cypriot ores [50] (Table 5, nos 3, 5, 9, 14), [84] (Table 11, 1957.21–24). They include a spearhead, knife, ring ingot, and axe apparently of Cycladic copper [50] (pp. 271–273, Table 5.3, 5, 14), [84] (Table 11, 1957.22), a knife with a lead isotope composition consistent with ores from Lavrion in Greece [15] (p. 112, Vasilia 1957.21), and a knife and two ring ingots with lead isotope compositions consistent with ore bodies in Anatolia [50] (p. 271, Table 5, no. 9), [84] (Table 11, 1957.23, 24) (but see [15] (p. 112) for a possible Cypriot origin for Vasilia 1957.23). While we need to keep in mind the caveats relating to LIA—notably the periodic overturning of attributions in the light of new data (see e.g., [98] and [99] (p. 10, Figure 10)—if supported by future analyses, this may require us to consider the possibility that the north coast was receiving the *majority* of its copper from external sources in the Philia EC period (and/or that incoming groups brought quantities of raw metal or /and artefacts with them).

The situation is not dissimilar in the MBA. Zofia Stos-Gale [100] has identified the lead isotope signature of the copper in 47 (52.81%) of 89 sampled objects from Lapithos as inconsistent with Cypriot

ores and likely coming from sources in Iran, Turkey, and the Aegean (see also [14] (pp. 388–392, Tables 2–4) and [15] (p. 116)) (Figure 12). Indeed, according to Stos-Gale [15] (p. 111), only 67% of all analysed copper-based artefacts from EBA–MBA Cypriot sites more generally are of copper of local origin. The Lapithos objects include spearheads, knives, axes, tweezers, a chisel, an awl, and pins of copper, arsenical copper, and tin bronze. They are, for the most part, of undoubted Cypriot types and include artefacts, for example mushroom-headed eyelet pins, which are almost exclusively found at Lapithos and likely to have been produced there. It would appear that significant quantities of copper from foreign sources may have been used alongside copper from local ore bodies to produce objects in MBA workshops at Lapithos.

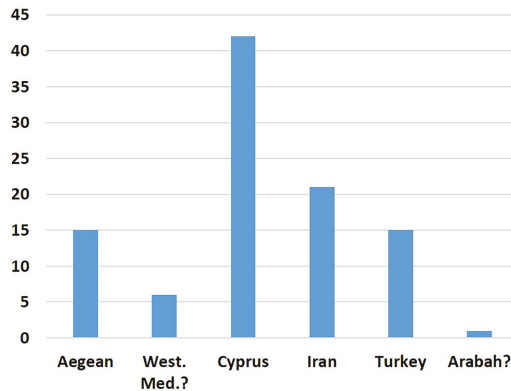


Figure 12. Possible origin of the copper in 89 artefacts from Lapithos, based on lead isotope analysis interpreted in accordance with the current data base for ores. Lead isotope data were provided and interpreted by Zofia Stos-Gale, April 2018.

We need also to consider the issue of tin. Tin does not occur in Cyprus and is not present in Cypriot copper ores [101], [102] (p. 277). While it was once believed that it did not appear on the island until the beginning of the MBA (ca. 2000 BC) [84] (p. 97), [94] (pp. 161–162), [103] (p. 69), it is now clear that imported tin bronzes (and tin metal) were reaching Cyprus and being produced locally almost half a millennium earlier. Compositional analyses have identified three Philia EC artefacts as tin bronzes [50] (pp. 266–267, Table 2: 2, 4, 8). Two (a spearhead and sword) are typologically out of place in Cyprus and have lead isotope ratios consistent with a copper source in the central Taurus Mountains. The third, an axe of Cypriot type, with a lead isotope ratio consistent with copper from the Limassol area, suggests that local metalsmiths were producing bronzes using local copper and imported tin. Additionally, six tin bronze earrings were recovered from a Philia EC tomb at Sotira in the south [48] (pp. 388–390), [85] (pp. 376–377).

The amount of tin entering Cyprus in the MBA has also been significantly under-reported. Balthazar, whose 1990 volume on EBA and MBA Cypriot metalwork included a study of all previous analytical work, concluded that tin bronze did not become common until the end of the MBA [94] (pp. 161–162). Similarly, Swiny [103] (p. 76) reported only 47% of alloyed metal in his MC sample, a far lower rate than in Anatolia or the Levant. Recent portable X-ray fluorescence (pXRF) analyses undertaken by Andreas Charalambous [13] of the University of Cyprus on 408 artefacts from MBA tombs at Lapithos have, however, identified 36% as arsenical copper (Cu–As), 29% as arsenical bronze (Cu–Au–Sn or Cu–Sn–As), and 20% as tin bronze (Cu–Sn) alloys, with only 14% of the assemblage of pure copper (Figure 13 left). While we need to take into account the limitations of pXRF, which examines only the surface of an object where some alloyed metals are more or less abundant than others [104] (p. 225), similar analyses elsewhere have proved successful in identifying the major

alloyed elements in prehistoric artefacts, while tending to overestimate the proportion of secondary metals [105] (p. 57). With due caution with regard to the latter, Charalambous' analyses show that 68% of analysed artefacts contain tin (Sn): 43% registered as between 0.1 and 4.9%, 8% between 5 and 10% and 17% over 10% (Figure 13 right). Thus, some 20% of the assemblage can be considered tin bronze (defined as greater than 2% tin, see [84] (p. 97)) or arsenical tin bronze (29%), and at least 17% as high tin bronze. It would appear that tin bronze, arsenical bronze, and arsenical copper were in widespread use at Lapithos in the MBA.

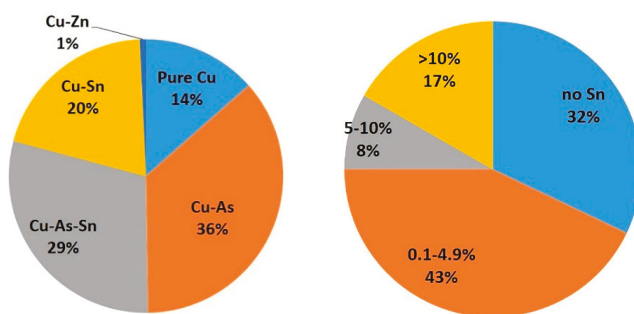


Figure 13. Results of compositional analysis by portable X-ray fluorescence (pXRF) of 408 copper-based artefacts from Lapithos. (Left): Percentage of pure copper, Cu-As, Cu-Zn, Cu-As-Sn and Cu-Sn. (Right): Percentage by weight of Sn. Data provided by Andreas Charalambous, University of Cyprus, Nicosia.

The tin in these artefacts was certainly imported, probably by the same north coast settlements that were exporting copper. While the minimum presence of arsenic required to distinguish an intentional alloy is a matter of debate (likely >2–3 wt %, see [105] (p. 67)), the amount present in many of the objects from Lapithos indicates the addition of arsenic-rich minerals or exploitation of the high arsenic polymetallic ores of the Limassol Forest area [106] (Table 5) [107] (p. 392). In either case, the evidence suggests that local and imported copper, imported tin, and arsenic sulphide minerals or high arsenic copper ores were available on the north coast in the MBA.

4.2. North Coast Artefact Production and Trade

The quantity of metal at north coast sites is remarkable. Over 28.3% by number, and a much greater percentage by weight, of Philia EC metal comes, certainly or very probably, from a small number of looted tombs at Vasilia [40] (p. 63), [50] (pp. 279–280, Table 6). The richness of the Philia EC period, more generally, in metal is also clear. At the excavated settlement of Marki in the Central Lowlands, 46% by weight of metal artefacts recovered came from Philia EC deposits; even though these deposits were far less well preserved than those of the later EC and MC periods [47] (pp. 185, 190). Philia artefacts also represent the majority of metal objects found at Pyrgos in the south [108] (Figure 18).

The presence of 49 metal artefacts in 22 tombs at Vounous Site A [58] (pp. 197–198, Table 4.7a) shows that the north coast continued to have privileged access to metal in the EC I–II period. The quantity of metal at Lapithos in the following MBA, however, is truly astonishing. In total, 140 tombs have produced over 1,800 copper-base artefacts, five times the number recovered from 164 tombs at Vounous [9] (pp. 132–133), [75] (p. 59). The amount of metal at Lapithos also increased dramatically through the MC period [9] (p. 133, Figure 2), [58] (pp. 68–9, 208–214, Tables 4.11b–4.12), [75] (pp. 59–60, Figure 1c). In contrast, relatively few metal artefacts have been found in MC tombs elsewhere, even at sites near copper ore sources and/or with evidence of metalworking [42,66], [108] (p. 88), [109–111], [112] (pp. 137–141), [113], Fissore in [114] (pp. 245–248). More surprisingly, few metal

artefacts are reported from the vast burial grounds at Deneia and Ayia Paraskevi [76] (p. 128), [115,116]. Thus while Knapp's suggestion [78] (p. 39) that copper was a scarce resource in EBA and MBA Cyprus may be true of some regions of the island, in particular the west and south, it does not apply to the central north coast settlements which are the focus of this paper (as indeed noted by Knapp in [80] (p. 159)).

The quantity of metal on the north coast and the presence of tin bronze and other alloys also suggest that a high level of metallurgical expertise existed in this region, possibly linked with the presence of metalsmiths and metal workshops. This is certainly likely to have been the case in the Philia EC period. I have suggested elsewhere that 13 Philia EC metal items acquired in 1959 and a set of nine metal objects found beneath the floor of a tomb at Vasilia [42] (p. 26, Figure 60) were hoards [50] (pp. 277–279). Both groups contain ingots, worn and damaged objects, and finished, unused items, which likely belonged to metalsmiths or merchants [117] (pp. 236–238, Table 1), [118] (pp. 11–14, Table I). Their presence suggests that traders and merchants and/or craftsmen on the north coast were engaged in the accumulation, distribution, and recycling of metal, and that their stock-in-trade included, as indicated by the analyses discussed above, copper from both local and foreign sources and objects of unalloyed copper, arsenical copper, and tin bronze.

The presence of a blowpipe tip in a tomb at Vounous Site A suggests the continued production of metal artefacts on the north coast in the following EC I–II period [40] (p. 65, Figure 6a), [41] (p. 345, Figure CXLIX.25). At Lapithos, the MBA assemblage shows the targeted use of bronze for some artefacts—notably pins—with mushroom-headed eyelet pins perhaps exclusively made of high tin bronze (Figure 14). This correlation between the chemical composition of alloys, manufacturing techniques, and artefact types suggests that north coast metalsmiths knew the effects that metal quality and composition had on the properties of casting and the formation of alloys and consciously chose manufacturing techniques and alloy recipes for given artefact types. This, in turn, implies a high level of technological knowledge (see [98,119]). The superior workmanship of some artefacts, particularly engraved pins, may further indicate contacts between metalsmiths at Lapithos and on the surrounding mainland [70] (p. 809) (see [120,121]), and a degree of mobility, linked not just with metal, but also with metalworking and metalsmiths.



Figure 14. A selection of eyelet pins, including mushroom-headed pins, from Lapithos. Photographs by Rudy Frank.

Finally, the textual evidence is critical. It mirrors Lapithos' rise to prominence in the MBA and suggests a significant outward movement of copper from Cyprus. Cuneiform texts of the late C19th (or 'earlier to mid-C18th BC', see [27] (p. 29)) to C17th BC from Mari, Alalakh, and Babylon refer to the receipt of copper, and, in one instance, of bronze from Alashiya, the ancient name of Cyprus or part thereof [63] (pp. 307–308), [122] (pp. 18–19), [123,124]. Lead isotope analysis also suggests the use of Cypriot copper in Crete at Ayia Photia in EB II [125] (p. 92, Table 5) and Malia in the C19th BC [126], and an increase in the use of Cypriot copper in the Cyclades in Early Cycladic IIIA [127] (p. 389, Figure 37.4b). This leaves little doubt that Cyprus was a significant source of copper in the Levant and the Aegean prior to 1700 BC, while the selective use of 'clean' copper by MB I Levantine craftsmen [119] goes some way toward explaining why Cypriot copper, which has a low level of impurities [128] (p. 194), may have been in demand. Altogether, this poses a substantial challenge to the view that communities in Cyprus were only passively engaged in long-distance networks in the EBA and MBA [78] (p. 24) (see also [129]) (p. 153), [130] (p. 40).

On the contrary, it would appear that Vasilia and Lapithos were significant nodes in an international maritime network, and actively involved in the internal procurement and export of Cypriot copper; and probably also in the manufacture of artefacts using local and imported copper and, certainly by the MBA, imported tin, lead, silver and gold. This requires us to ask how these north coast settlements were acquiring copper for manufacture and export from ore bodies located some 35–40 km distant on the other side of the Pendaraktylos Range. Without stretching the credibility of the available data, can we use the prism of central place theory to suggest how such a system may have worked and the degree of organisational complexity required to initiate and sustain it?

5. The Issue of Centrality

If the importance of an archaeological site is determined by its centrality—and centrality is a measure of the relative concentration of interaction [16], [131] (p. 219)—then our task is to assess the degree and type of interaction visible at our three settlements within an inter-regional political economy. It is important at this point, however, to distinguish between central places, as defined by Christaller [132] (for a recent critique and redefinition see [131]), and nodal points or hubs, as defined by Sindbæk [133]. While central places are served by local traffic and depend on maximum accessibility from a hinterland, 'the function of a nodal point is exercised through long-distance traffic and will therefore be stimulated in particular by topographical restrictions that guide traffic into corridors' [133] (p. 128). Most nodal points are situated in locations where a topographical barrier caused a break in traffic and demanded the trans-shipment and perhaps temporary storage of goods [133] (pp. 128–129). The geographical outcome is likely to be a network with a few sites in boundary-locations acting as hubs or nodal points for long-distance traffic within a widespread web of more localised contacts [133] (p. 129). These nodal points are distinguished by a high incidence of imports and tools of exchange, and frequently by craft production using imported raw materials. Importantly, nodal networks are primarily concerned with long distance exchange and do not necessarily reflect hierarchical relationships or political centrality.

The location of nodal points is influenced by the conditions topographic parameters create for exploitation, transportation, and exchange. Deneia, located in the Ovgos Valley midway between the Agirdha Pass and the northern foothills of the Troodos and possibly on a river crossing, is ideally suited to support strong flows of transit traffic and an obvious candidate for a nodal point (Figures 15 and 16). It was occupied already in the Philia EC period, but grew rapidly in the MBA when burial evidence suggests a massive upsurge in population that could not have been achieved by natural increase alone (estimates of the MBA mortuary population range from 9000 to 20,000, see [76]) (pp. 152–154). It is well-positioned to have served as a broker/trans-shipment point both on a north/south route through the Agirdha Pass and east/west along the Ovgos Valley, as well as an agricultural production centre and perhaps an organisational outpost. Ayia Paraskevi, occupied from the Philia EC and located in the Central Lowlands some 18 km to the east, may similarly owe its

importance at this time to its position on a route south to settlements near ore bodies in the northeast Troodos [24] (p. 122), [44] (pp. 447–454), [115] (on possible networks as envisaged through least-cost path analysis see [12] (pp. 97–99, Figure 2)).

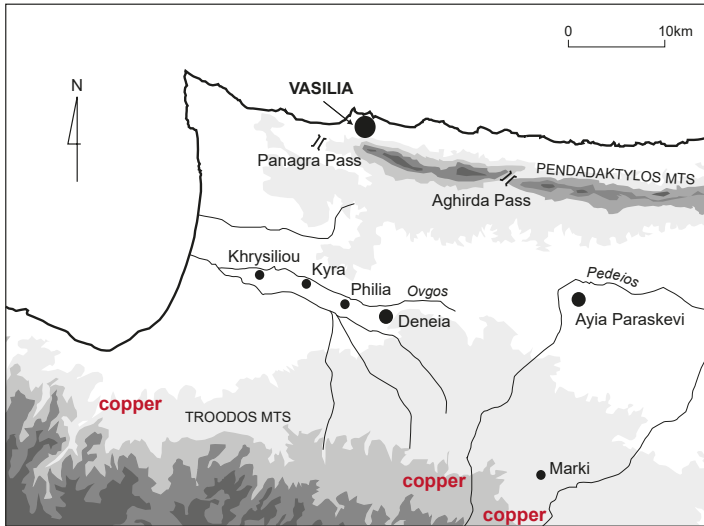


Figure 15. Map of northwestern Cyprus showing suggested nodal points in an internal copper procurement network mobilised by Vasilias during the Philia EC period.

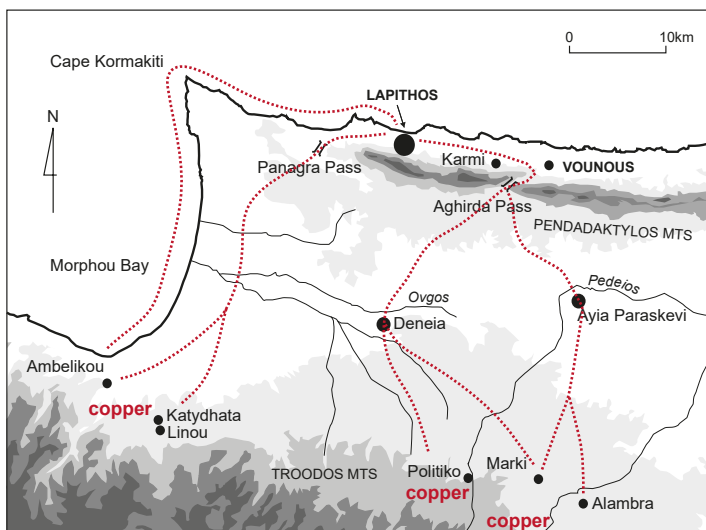


Figure 16. Map of northwestern Cyprus showing suggested nodal points and transportation routes (red dotted lines) in an internal copper procurement network mobilised by Lapithos in the MBA.

Vasilias and Lapithos may also be viewed as nodal points or junctions. Both were ‘end points’ within an internal network and points of off-island contact and exchange, engaged in

the trans-shipment and likely production and distribution of outgoing and incoming goods, and thus also nodes within a broader maritime interaction sphere. Their coastal location suggests that this external connectivity was prioritised from foundation over proximity and direct access to copper ore bodies. While the location of Vasilia was almost certainly linked with the arrival by sea of new groups on Cyprus at the beginning of the EBA, the foundation of Lapithos, on or near the coast, is likely to have been entirely 'market-driven'. At the same time, the success of both harbour towns as consumers and suppliers of metal indicates their ability to contest and secure access to copper supplies and transportation routes over considerable distances.

Access to long-distance exchange systems may have provided an opportunity for emerging elites in these nodal settlements to create bottlenecks or brokerage points, and ultimately, social debt, by controlling the movement of resources and through differential access to materials. While none were located in catchments which could meet all their economic needs, Lapithos, Deneia, and Ayia Paraskevi drew in large populations in the MBA (and likely Vasilia in the Philia EC), perhaps by offering a range of social, political, economic, and ideological opportunities. The nature and intensity of tomb construction at Deneia gives the appearance of considerable prosperity. Ayia Paraskevi has also produced several remarkable burial assemblages [24,115]. The co-presence of these large sites in a single network suggests multiple pathways to economic prosperity, with nodes differentially positioned near metal resources, on transportation routes, and at trans-shipment points.

Elsewhere in the Bronze Age world, the expansion of extractive industries and an increase in inter-regional exchange provided opportunities for emerging elites to exert influence over the flow and production of metals and led to increasingly centralised hierarchical socioeconomic institutions [134–136]. Complex urbanised regional polities with institutionalised inequality certainly developed in Cyprus in the LBA, but mining, specialised production, and external trade started well before the MBA/LBA transition. How hierarchical were these earlier networks? Were the transfer mechanisms that brought copper to the north coast dependent on autonomous relations within a network of localised contacts managed through nodal points or more actively manipulated by managerial elites in dominant north coast centres?

Despite the paucity of settlement data, I believe we can provide some answers to these questions. Much work in this area is based on the assumption that similarities and differences in material culture reflect the frequency and intensity of contacts between sites [137] (p. 13), [138]. If inter-regional patterns in material culture can be taken as indicators of the scale of connectivity, then the homogeneity of Philia EC ceramics and personal ornaments and the near island-wide distribution of pottery from northern workshops suggest multiple small-scale interactions between closely related communities and successful long-distance commodity networks. The latter were operating from the north coast or Ovgos Valley and are likely to have involved a reciprocal northward movement of copper. Beyond this, the level of functional differentiation in the use of land and resources during the Philia EC remains unclear, but metalworking is indicated at Marki and seasonal or permanent mining settlements must have existed in the immediate vicinity of ore bodies.

The situation is both clearer and more complex in the MBA. Here, the use of similarity coefficients as a proxy measure for connection strength tells us only part of the story. Rather, a combination of regional characteristics, local specifics, and the movement of pottery and other goods allows us to suggest something of how the north coast was procuring copper for production and export. Firstly, it is clear that Lapithos' greatest connectivity was with Deneia. Ceramic production at Deneia is highly distinctive. A number of vessel forms and clusters of stylistic attributes unique to this site belong to an emblematic local style, which may have been part of a conscious construction of community identity coincident with population aggregation [139]. Vessels from Deneia occur with some frequency and cluster in particular tombs at Lapithos (Figure 17), and, similarly, vessels from Lapithos are present in the cemeteries at Deneia (see e.g., [76] (pp. 70–71)). In both cases, they are fine tableware (jugs, juglets, and bowls) rather than storage or transport vessels (on primary (vessel) and secondary (container) wares in exchange contexts see [140] (p. 194)), which likely reflects the mobility of individuals and

thus a significant presence of people from Deneia at Lapithos and vice versa. At the same time, the distinctive ceramic tradition at Deneia, and differences in tomb architecture and burial practice between these two sites, suggest that this connectivity was primarily economic (rather than cultural or ancestral), and that proclaiming and maintaining local identity at nodal points was an important characteristic of the network.



Figure 17. Pots typical of Deneia found in tombs at Lapithos. Photographs by Rudy Frank.

The evidence from Ambelikou is also instructive. Here, a permanent settlement with workshops for smelting, casting, and the production of ingots, as well as pottery production, was located adjacent to a mine in the MBA [7]. While the site's closest ceramic relationships were with nearby communities at Katydhata and Linou in the Karkotis Valley [7] (p. 222), which were probably also engaged in mining and smelting, the strongest extra-regional connections were with Lapithos. The almost complete absence of ceramics from Deneia at Ambelikou and in the Karkotis Valley suggests, however, that copper was not shipped northward via the Agirdha Pass but by sea via Cape Kormakiti, or overland via a route running inland from Morphou Bay through the Panagra Pass [7] (pp. 220–221) (see Figure 16). The presence, similarly, at Ambelikou of some vessels from the west suggests connections with the Khrysochou Bay area [7] (pp. 78, 95–98, 223). The miners and smelters at Ambelikou were clearly producing metal for distribution beyond the site. While most ingots probably made their way to the north coast, the presence of western goods suggests that metal was also traded out to the west and thus that the community at Ambelikou enjoyed a degree of autonomy in the management and distribution of their products.

One class of object, likely to have been of significant symbolic value, appears to have been moving outward from Lapithos within a specific operational network. These are terracotta 'plank figures' which average 25 cm in height and depict flat, stylised figures wearing elaborate jewelry and decorated garments. Variants include figures holding infants and two- or three-necked figures. While the question of what or who they depict—deities, ancestral figures, or human agents—remains open, they were clearly associated with ritualised activity in mortuary contexts [141]. Some 40% of provenanced examples have been found at Lapithos, and only Lapithos has produced the full range of types (Figure 18). This suggests production at this site, at least initially. Elsewhere, they occur at Deneia and Ayia Paraskevi and at the smaller villages of Marki, Alambra, Politiko, and Ambelikou, where the presence of more crudely modelled figurines, which emulate imported plank figures (e.g., [47] (pp. 156–157, Figure 5.3)), suggests that they had a significant local impact. The down-the-line movement of these high value items implies greatest connectivity between Lapithos, Deneia, and

Ayia Paraskevi and sites between these nodes and the ore bodies. This highlights the role played by the north coast in the materialisation of symbolic ideas within this network.

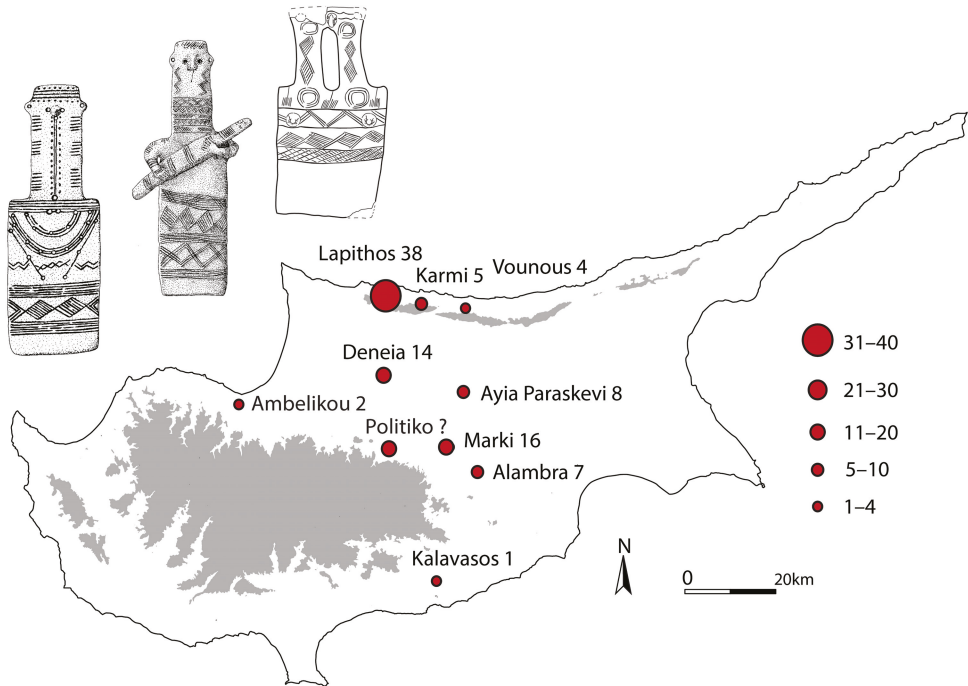


Figure 18. Map of Cyprus showing the distribution of plank figures.

This is not, then, a simple case of material culture similarities serving as a proxy measure of interregional connectivity. Rather, for much of the MBA, connectivity is visible in the movement of stylistically distinctive products between certain nodes in the network, the exception being the unidirectional distribution (and local imitation) of plank figures from an ideologically dominant Lapithos. A further complicating factor is the number of weapons on the north coast. While there has long been a tendency in Cypriot archaeology to romanticise the EBA and MBA as comprised of peaceful, agrarian, egalitarian settlements (most recently [142]), the number and concentration of bladed weapons at Lapithos in the MBA suggest a very different scenario. While initially likely to reflect competition between Lapithos and Vounous for dominance on the central north coast, they may also signal the emergence of a military group or class (as suggested for concentrations of weapons elsewhere, see [143] (p. 101)), and leave little doubt that some groups at Lapithos had the capacity to raid, trade, and protect their wealth. What appears to emerge from the evidence discussed so far is a complex relational mix of autonomy and connectivity, interdependence, complementarity and, potentially, coercion within a network of economic transactions linking functionally specialised settlements over considerable distances.

The dominant role of Lapithos with respect to the use and disposal of metal, however, is clear. The sheer quantity of metal, the use of imported copper and high tin bronze and the presence of unique artefact types suggest that it served as more than just a conduit for finished goods and raw materials originating in the hinterland, and likely as a production centre receiving and converting raw materials from both within Cyprus and without. This, in turn, is likely to have involved a significant degree of craft specialisation. While at present we have no direct evidence for this, the scale of production,

the number of persons involved, and the expertise gained from the repetition of procedures argue for the presence of skilled craftsmen at Lapithos (see [99] (p. 2), [144]). Metalworking (and weaponry) is also indicated at Vasilia in the Philia EC in the form of the hoards, and possibly also at Vounous in EC I–II, as noted above. Thus, metalworking may have been a long-standing technological tradition on the central north coast, setting the political economy of these settlements even further apart from those located elsewhere in the network.

Also visible, over time, at Lapithos are significant changes in social structure and in the function and value of metal. Some MBA tombs stand apart from the rest in terms of their size and architectural complexity and are characterised by an oversupply of metal and pottery. Some also show evidence for the manipulation of burial space and likely ritual activity, and for the caching, hoarding or accumulation of metal [57], [75] (p. 63), [77] (pp. 134–136), [145] (Figure 19). By the end of MC II, metal artefacts appear to have ceased to be valued as personal possessions in the burial domain. Together with the likely manipulation of exotic goods for political purposes and a degree of ‘industrialisation’, this accumulation of symbolic capital suggests the management of metal wealth at a corporate level and the emergence of inheritable categories of wealth and status. Lapithos may, at this time, have been moving towards an increasingly exclusionary political economy, dependent on network strategies by which leaders controlled bottlenecks in the production, exchange, transport, and defence of prestige goods, weapons, and other highly valued objects [146] (pp. 31–32, 36–38), setting them apart also in patterns of consumption and deposition.

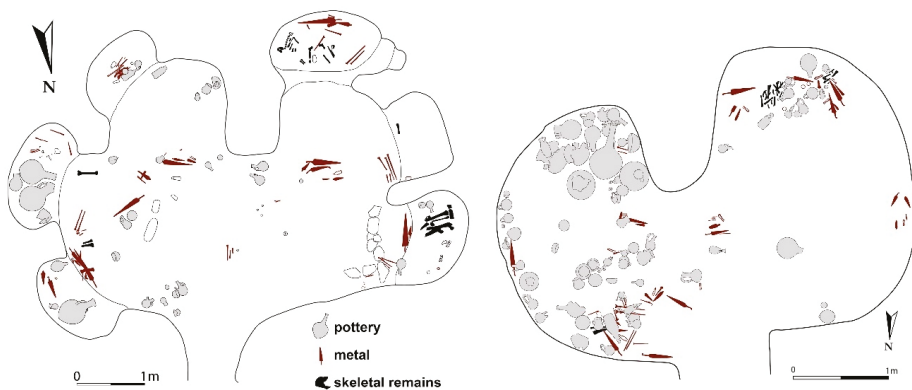


Figure 19. Two tomb chambers at Lapithos with evidence for the caching or hoarding of metal (after [68] (Figures 43.1, 50.6)).

6. Central Places and Central Flows

Central flow theory, introduced elsewhere to complement central place theory in relation to urban structures [147], may be a useful tool for understanding the prehistoric Cypriot context. While central places are hierarchical vertical spatial structures linking local scales of interactions (hinterlands), networks are primarily horizontal and link non-local interactions [147] (p. 2804). The latter involve central flows and centrality but are not dependent on dominant or central places. Similarly, Meijers [148] (p. 248), although also discussing urban structures, identifies complementarity as a main feature of the network model with two-way flows between different and similar-sized settlements leading to significant horizontal accessibility. While the location of settlements is fixed, their relative importance is prone to change. Individual agents also form parts of network-like structures, with partners and subordinates at various nodes, and considerable movement is likely to take place between settlements to profit from resources and opportunities available at specific nodal

points [147] (p. 2806). In central flow theory, it is ‘flows that come to centre stage as the building-block generating a network’, not centrality of location [147] (p. 2814).

The physical affordances of the central north coast of Cyprus, which included access to small but suitable harbours and territorial control of one or both passes, offered particular infrastructural possibilities. Lapithos was especially well-positioned to control the Agirdha and Panagra Passes, located, respectively, some 12 km to the east and 9 km to the west, and, with shipments of copper from the northwest Troodos possibly also arriving by sea, had the capacity to act as ‘a supply area’ or point of convergence for commodity flows without being dependent on a single source or access route (see Figure 16). This must have been among the locational advantages of Lapithos over Vounous and likely allowed Lapithos to exercise significant control over network structure and flow with less vulnerability to localised disruptions. This combination of advantages may have permitted Lapithos to achieve a high degree of network centrality during the MBA. This is not to suggest that other actors and nodes were not autonomous, pro-active, and self-interested. A degree of interdependence and cooperation would appear to be necessary if we are to explain how such an extensive network could have worked at all. The concentration of weaponry in some tombs at Lapithos suggests, however, that relationships on either side of the Pendadaktylos Range became increasingly asymmetrical over time. This may also help to explain why, when external market access conditions were no longer favourable for north coast agents, the settlement at Lapithos lost its centrality and swiftly declined.

Centrality assessment measures discussed by Knitter et al. [16] (pp. 4–8, Figures 4 and 5) for several EBA and LBA settlements in Anatolia are based on evidence for five central functions: namely, administration, craft/industry, trade, cult, and security. While direct evidence for administration remains elusive for all three of our sites, trade and the production of metal artefacts are indicated for Vasilia, Lapithos and perhaps also Vounous, and Lapithos, Vounous and possibly Vasilia were centres of ceramic production. Vounous appears to have been of significant local and possibly inter-regional ritual/ideological authority, and the distribution of plank figures suggests that Lapithos also had considerable ideological reach. In the case of Lapithos, we may add the provision of security, at least within its own territory. While the political element remains elusive, rivalry between Vounous and Lapithos must have involved a struggle for authority (centrality) within this region, and likely the control of communication routes, information flows, knowledge, and external contacts.

7. Conclusions

The focus here has been on two primary topological (structural) properties of distribution/connectivity networks—integration and hierarchy. In an extremely hierarchical network, a handful of nodes will have far higher levels of centrality than other nodes, resulting in high centralisation indices [138] (p. 215). This was probably the case during the Philia EC, when fine ware pottery was distributed from one or several northern production centres, and high material culture similarity indices are visible across much of the island. The loss of an external market led to the demise of this network and the emergence in the EBA of Vounous as a singular settlement with a highly idiosyncratic material culture, few traces of which are evident elsewhere even within its micro-region. Connections with the Central Lowlands, however, remained in place and the north coast continued to receive metal and possibly to produce artefacts for its own needs.

In the MBA the re-engagement of the north coast in external trade led to the re-establishment of a political economy, this time at Lapithos, which depended on a secure supply of local copper, but now within a significantly smaller procurement network, largely confined to the northern Troodos and Central Lowlands. While this network appears to have been less hierarchical, some nodes certainly had higher levels of centrality than others and Lapithos was able to establish economic, cultural, and ideological pre-eminence. This pre-eminence, however, must always have been fragile. If the law of decreasing interaction with distance applies to all forms of communication [1] (p. 1), [149], connectivity mechanisms would always have been critical. These may have been enhanced by ‘intervening opportunities’ [150] offered by nodal points, like Deneia and Ayia Paraskevi, and a high degree of

mobility, autonomy, and collaboration, possibly underpinned by the coercive monitoring of key routes. Whatever the case, it is unambiguously evident that for several centuries distance deterrents (the cost of transportation, loss of information, and security of persons and goods) were successfully overcome.

Given the (dis)location of ore deposits, agricultural soils, population centres, and natural harbours in Cyprus, the spatial (distance) dimension involved in off-island commodity flows was always critical. If Lapithos was receiving copper from extraction points in both the northeast and northwest Troodos as well as through maritime trade (along with tin and precious metals), such a convergence of supply surely qualifies it as a centre with considerable linear outreach. While not a 'central place' in Christaller's terms, it was clearly a central node within a complex communication and transport network, and likely a centre of metal production and distribution. The presence and number of weapons suggest a community conscious of its economically privileged position and the need to defend it, and a degree of 'militarisation' may have been one of many ways in which this site developed different values and identity. The earlier dominance of Vasilia, and this site's engagement with international trade, may have led to the early development in this region of both seafaring and external contacts. Thus, in addition to the geostrategic importance of the north coast, communities here *could* have developed a strong comparative advantage over the *longue durée* in seafaring, metallurgy, organisational expertise, and possibly also in military prowess.

The central north coast was, for some 750 years, a major focus not just of settlement and trade, but also of cultural and ideological authority on Cyprus. Changing circumstances gave our three sites a high potential for centrality at some times and dramatically reduced it at others. This was a product of locational advantage, long-term historical process, and the combined effects of three key factors: the generating capacity of the origin, the attraction of the destination, and the 'resistance' incurred through distance (the so-called 'gravity law', see [1] (p. 5)). Distance measures become economically relevant when interaction is channelled through the links of a given network ([1] (p. 2)). While we still have much to learn, it is clear, given the topography, that they were not straight-line distances and that monitoring of communication and transport routes and the availability of alternative sources of metal must always have been critical. While the external demand for Cypriot copper remained in place and the shipping lanes continued to favour north coast outlets, the north coast sites had a structural advantage as network actors that they were able to convert into long-term socioeconomic success. This must have involved a significant degree of managerial expertise, possibly initially introduced by groups who arrived in Cyprus at the start of the EBA and maintained through social relationships embedded in individuals, groups, and institutional structures. Thus, it is possible to suggest that these north coast settlements combined both *natural centrality*, based on their location within the local environment, and a *politically controlled centrality*, brought about by human efforts to assemble central functions and achieve economic and ideological authority at a supra-regional level (see [16]).

The focus here has been on the north of the island. Elsewhere, there is increasing evidence for workshop production of metal, pottery, textiles, perfume, oils, and perhaps beer [67] (p. 217), [108,151–154], suggesting a similar targeted use of the landscape and its resources and a significant degree of mobility in the volume and flow of goods and information within regional and perhaps inter-regional networks. While we may not be able to trace in detail the transformation from egalitarian villages to communities with surplus accumulation (see [155,156]), we can argue for the interdependence of settlements within networks maintained through regular contacts and the movement of people and goods. This implies off-site distribution and local control of production with multiple site-to-site exchanges suggesting 'collaborative and strategic action' [155] (p. 34). While it would be naïve to think that this was all smooth sailing (note the existence of a circuit wall and complex locking mechanisms in the workshop at Erimi, see [153]) (pp. 350, 357, Figure 16.2)), only at Lapithos is a degree of physical coercion visible. This is one of many respects in which this settlement stands apart.

The scenario proposed here is necessarily speculative. The dots could no doubt be joined in other ways and there is much that remains beyond our ken, including the extent to which seafaring may have been part of the north coast 'phenomenon', and the role which language, ancestral bonds, and

other aspects of cultural affiliation may have played in creating directed ties between individuals and communities. At best, it may provide a partial explanation of the processes which contributed to settlement location and the organisation of economic activities that operated to produce the data that we have. While we should be wary of attempting to aggrandise our own area of interest (see [157] (p. 180)), the singularity of the north coast in the EBA and MBA is undeniable, and excavated settlements elsewhere on the island cannot be taken as proxies for those we currently lack in this region. What happened on Cyprus ca. 1700 BC was a major shift that ultimately led to the rise of complex urban polities at Enkomi and elsewhere in the LBA. It may, however, be best understood as a relocation, reorganisation, and further development of systems and structures (coastal outlet/specialised production/distance procurement network), together with accumulated social and institutional knowledge, which existed on the north coast in the MBA and likely already in the EBA.

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Article

Watery Entanglements in the Cypriot Hinterland

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Abstract: This paper examines how water shaped people’s interaction with the landscape in Cyprus during the Bronze Age. The theoretical approach is drawn from the new materialisms, effectively a ‘turn to matter’, which emphasises the very materiality of the world and challenges the privileged position of human agents over the rest of the environment. The paper specifically moves away from more traditional approaches to landscape archaeology, such as central place theory and more recently network theory, which serve to separate and distance people from the physical world they live in, and indeed are a part of; instead, it focuses on an approach that embeds humans, and the social/material worlds they create, as part of the environment, exploring human interactions within the landscape as assemblages, or entanglements of matter. It specifically emphasises the materiality and agency of water and how this shaped people’s engagement with, and movement through, their landscape. The aim is to encourage archaeologists to engage with the materiality of things, to better understand how people and other matter co-create the material (including social) world.

Keywords: Cyprus; Bronze Age; water; materiality; new materialisms; entanglements; assemblages; networks; central place theory

1. Introduction: A New Materialist Approach to Past Environments

This paper seeks to evaluate how the agency of water shaped the development of the Cypriot landscape during the Bronze Age, focusing on how the natural world itself shaped peoples’ engagement with their environment. It draws upon the new materialisms [1–3], a theoretical perspective that is gaining traction within the wider social sciences, including archaeology. This approach, which is embedded in what Fox and Alldred (p. 3) describe as a ‘turn to matter’ [4], seeks to move beyond anthropocentric discussions of people’s responses to, and manipulation of, the natural environment; instead, it considers the complex relations between people and place from a perspective which acknowledges the agency of matter (in this case, water). Embracing such an approach is, I would argue, fundamental for our understanding of past environments and landscapes; these were not simply shaped by people’s actions, inscribing their will upon a passive and inert natural world. Instead, it contends that humans are simply one of the myriad things/matters that emerge to coproduce the material world.

For archaeologists who are primarily engaged in trying to piece together human action from the archaeological record, this approach is challenging, upturning as it does our understanding of the human agent’s relationship with matter, seemingly foregrounding the physicality of the archaeological record, and in particular, environmental data. In fact, the new materialisms attend not only to nature and the environment, but also the place of embodied humans within the material world. They provide us with new ways of thinking about the archaeological record, exploring the transformative role played by matter in the creation of past material and social worlds. At the same time, it acknowledges humans were entangled within, and indeed part of, these material worlds: they coproduced it through their actions, but were likewise constrained by the very physicality of the matter and substances with which they interacted. This shift in perspective actively embeds humans within the material

environment, and draws attention to how human agency is constituted by the matter with which it engages. This is a recursive relationship: matter equally responds to, acts with, and even directs human agency, both enabling and provoking certain responses from the human actor. Therefore, although this approach questions the dominant, privileged position of human agents, it does not advocate that we cease searching for people and their actions within the archaeological record. Indeed, the new materialisms perspective potentially provides a middle ground between empirical, science-based archaeologies and social archaeology [5], bridging the intellectual gap that has developed between studies of the environment and artefacts: the former traditionally as a resource to be exploited and mastered, and the latter as objects created by, belonging to, and imbued with meaning by people.

2. Central Places, Networks, or New Materialisms? People in the Landscape

In this paper, I address the interactions of people with, and within, the Bronze Age landscape of Cyprus. Previously, archaeological studies of settlement and landscape have drawn upon central place theory and network theory. Central place theory [6] looks at political and economic relationships of settlements within a wider rural territory, specifically identifying locales that serve as the economic, sociopolitical, and ideological hub. There is an understanding that these are urban in character and have a centralised administrative role, such as the collection of taxes. Jimenez and Garcia (p. 85) [7] provide us with several criteria for the archaeological identification of a central place. This should be the largest site in the region, dominating it administratively, economically, and physically (presumably through ideological and/or military force); it is the seat of a ruling class/elite and is thus associated with centralisation of specialised production; there should also be evidence for increased economic and social diversification at this locale. It is worth noting that these criteria fit within hierarchical models for settlement and social organisation and perhaps are not easily applicable across all cultural settings. Alternative models of settlement organisation—such as heterarchy [8,9], which allows for urbanisation without imposing a top-down power structure on the archaeological record—might provide a better understanding of inter- and intrasite relations, as for example, Keswani's [10] analysis of Late Bronze Age settlement on Cyprus and Schoep's [11] discussion of Middle Minoan II Malia. Another model, which takes account of increasing social stratification in a nonurbanised society, has been developed by Frangipane [12] to explain the architectural and social complexities evident in fourth-millennium Arslantepe in eastern Anatolia. These approaches are helpful for understanding the apparent centralization of workshop activities and storage at Erimi *Laonin tou Porakou* [13].

Meijers (p. 245) notes how “the central place model has had increasing difficulties explaining spatial reality”, in part because of the inevitable hierarchical structure, but also because it does not fully take account of the relationality of settlements within a landscape or territory [14]. He instead proposes a network model of spatial organisation. Network theory focuses on the *interconnections* between nodal points; these might, for example, be thought of as social entities (people), objects, or as places in a landscape inhabited or otherwise used by people. Network theory moves the perspective away from the nodes (e.g., central places and other sites) to the connections between them (e.g., movements or flows of people, material culture, knowledge, etc.). As Collars et al. note (p. 5–6), it is these *relationships* between peoples, things, and/or places that constitute the structure of a network and are thus important [15]. Most archaeological applications of network theory have tended to focus on the interactions between people and things [16], largely drawing upon Latour's actor network theory [17], but there have been some studies on the connectivity and intervisibility of sites. For example, archaeologists have explored connections between localities using proximal point analysis [18], which considers the physical relations between sites by marking these as points on a map and linking each one to its three closest neighbours—a method employed to great effect by Broodbank to explore seafaring networks within the Cycladic archipelago during the Early Bronze Age [19] and more recently by Collar to the Jewish Diaspora of the first and second centuries A.D. [20]. Proximal point analysis, however, does not take into consideration the physical composition of the landscape (mountainous terrain, waterways, etc.) and how people actually move through it;

instead, the assumed interconnections are simply plotted as straight lines as the crow flies onto a two-dimensional map. In a more recent application of network theory, Brughmans et al. (p. 65) explore long-term changes in visibility patterns between settlements in Iron Age and Roman southern Spain [21]. As with the proximal point analysis, the settlements are represented as nodal points; however, here the focus is on the relationality (in this case, the intervisibility or lines of sight) between these nodes, which is represented as arcs (directed edges) between two sites. This approach takes into consideration the physical configurations of the landscape—high ground, waterways, etc.—and thus how people might have moved through and interacted within it.

In this paper, however, I argue that central place and network theory are both problematic because they privilege the position of the human in their environment, and as a corollary, they *separate* and *distance* people from the material world. These approaches, at best, obscure the environment; rather than embedding people within (and as part of) it, these perspectives place people like an overlay onto the landscape. It assumes that people move across and manipulate the *natural* world, which is defined as passive, inert, and waiting for human action to give it meaning. While phenomenologically-informed landscape archaeologies contend that it is human action that creates places [22], that people move through the land and inscribe it, but they are not part of it, a new materialist approach situates people both *in* and *as part of* the landscape, acknowledging them as one of many agencies of matter. It recognises peoples' innate materiality, that they are part and parcel of the flows of agency in what Barad (p. 817) describes as 'an ongoing open process of mattering' [23].

The new materialisms likewise emphasise relationality between entities/matter, for example, through the concept of assemblages (or *agencement*). An assemblage is the coming together and interactions of a heterogenous and nonhierarchical group of entities described by Bennett (p. 23) as "ad hoc groupings of diverse elements, of vibrant materials of all sorts... living, throbbing confederations" [1], constantly in flux or, as Harris (p. 90) describes, "in a state of becoming" [24]. The constituent parts of the assemblage are multiscalar [25], from the micro (such as microbes and bacteria) to the macro—not simply the human agent or a body of water, but even to the scale of human communities, overarching political systems, even the state, thus illustrating how tangible material entities and the immaterial might cohere to coproduce assemblages [26]. Key to understanding an assemblage is that it, as DeLanda observes (p. 2, my italics), 'actively links these parts together by *establishing relations between them*' [27]. This relationship is, moreover, recursive; as DeLanda (p. 83) comments, the "properties of a whole are produced by the ongoing interactions between its parts, while the whole . . . reacts back on this part" [27]; thus, an assemblage is more than the sum of its constituent parts. The other advantage of assemblage theory is that it automatically allows us to analyse and integrate materials at different scales—from microscopic environmental data, through the individual artefact (even drilling down to the component materials of this object), to the broader geographical scale typically encompassed within landscape archaeologies—and moreover, to consider how these variously interacted with, and were shaped by, the intangible, ephemeral, and immaterial, including thoughts, ideas, and social structures. The challenge of assemblage theory, then, is to think beyond the residual physical remains of the past, instead focus on the ebb and flow of (im)material interactions, and through this to explore relationality in the past.

The relationality of assemblages alludes to entanglements of matter [28]—the "multiple intersections and tangled nature of being" [3]. The approach taken here is distinct from Hodder's perspective on entanglement [29]; Hodder (p. 95) argues that people and things are "entwined, involved with each other, tied together" and impact upon each other; this is framed within a flat ontology, in which people and things (materials and or/objects) are equal and distinct from each other, effectively separating people from the rest of the material world. For Ingold (p. 4), entanglements represent fluxes and flows of matter within "a meshwork of interwoven lines of growth and movement" [30], with no defined point of origin or directionality. In this article, I follow Barad's [28] understanding of entanglement, derived from quantum physics: the understanding that there are no fixed entities and that things/phenomena come into being (or gain meaning) through

their intra-action; rather than focusing on individual entities (or, in quantum physics, individual particles) separately, it describes the system (social and material worlds) as a whole, taking into account how material agencies emerge and act together. Therefore, rather than trying to impose nodes and (artificial) networks of human activity onto a partially mapped Cypriot Bronze Age landscape, this paper explores human interactions within, and as part of, the matter of the material world through the lens of the new materialisms, emphasising flows and entanglements of matter and thinking about these as assemblages, an approach that is gaining traction in archaeology [31]. As Barad (p. 170) notes:

“Bodies do not simply take their places in the world. They are not simply situated in, or located in, particular environments. Rather, ‘environments’ and ‘bodies’ are intra-actively co-constituted. Bodies (‘human’, ‘environmental’, or otherwise) are integral ‘parts’ of, or dynamic reconfigurings of, what is” [28].

3. The Cypriot Bronze Age Landscape: A Brief Overview

Discussion of settlement and landscape in Bronze Age Cyprus (Figure 1) have largely been viewed through the lens of resource management, in particular focusing on increasing exploitation of the island’s metalliferous zone around the foothills of the Troodhos mountains throughout the third and more so during the second millennium B.C. Nonetheless, the footprint of human activities in Cyprus changed greatly over the two millennia of Bronze Age occupation on the island (Table 1), and, as both Steel [32] (p. 11) and Knapp [33] (pp. 21, 24) have commented, have typically been presented within a cultural–historical framework. Before turning to the watery entanglements that shaped this landscape, I will briefly outline these shifting patterns of settlement. A more detailed analysis of the trends in site distribution and topography in the Early-Middle Cypriot (henceforth) EC–MC period is provided by Georgiou [34].

Table 1. Chronological table for Bronze Age Cyprus (after Knapp 2013, Table 2).

Cultural Phase	Approximate Date B.C. (Calibrated)
Philia facies	2400/2350–2250
Early Cypriot I–II	2250–2000
Early Cypriot III–Middle Cypriot II	2000–1750/1700
Middle Cypriot III–Late Cypriot I	1750/1700–1450
Late Cypriot IIA–Late Cypriot IIC (early)	1450–1300
Late Cypriot IIC (late)–Late Cypriot IIIA	1300–1125/1100

The Philia facies, which marks the transition to the Early Bronze Age, is characterised by the establishment of new settlements in the central and western Mesaoria, around the edges of Troodhos mountains, and along the north coast. Some, therefore, were in close proximity to the island’s copper deposits, near good agricultural land, and/or with access to the sea [35]. There are small shifts in settlement pattern throughout the longue durée of the EC–MC period. Some sites have evidence of successive layers of occupation: such as Marki *Alonia* from the Philia phase to MCII [36] and Politiko *Troullia* [37] from EC II–MC III (based on the pottery), while others, such as Sotira *Kaminoudhia* [38], were only occupied during the EC period. There is, however, a rise in the number of settlements in the MC period, with the establishment of new sites such as Erimi *Laonin tou Porakou* [39], suggesting increasing population, probably due to the use of traction animals and land clearance resulting in improved arable production. Until recently, our knowledge of EC–MC settlement was largely derived from the associated cemeteries, but over the past twenty years or so, there has been extensive excavation of a number of key sites. Settlements were frequently extensive, covering some 15 and 20 hectares, and many were located on a low plateau, close to good arable land and a water supply [40]. Clusters of settlements occur in particular geographic zones, such as along the northern coastal plain and around the northwestern foothills of the Troodhos massif, especially at the interface of the arable land and the mineral-rich lower reaches of the Troodhos. Moreover, recent excavations at Kissonerga *Skalia* [41]

and Prasteio Mesorotsos [42] have filled an apparent gap in EC–MC occupation in the southwest of the island.

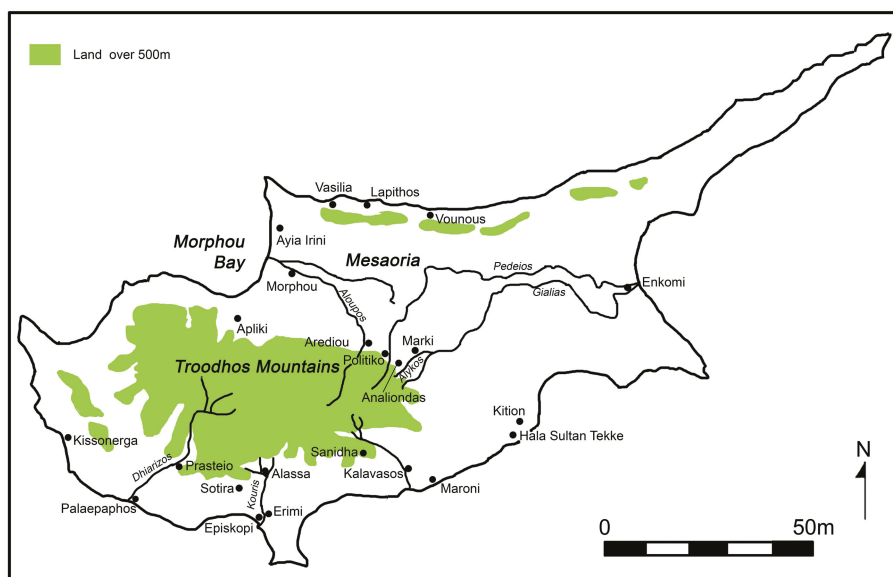


Figure 1. Map of Bronze Age Cyprus, indicating sites and rivers mentioned in text.

Although regionality has been explored [43,44], largely through variable patterns in the geographic distribution of pottery, there has been less emphasis on relationships (networks or assemblages) between the EC–MC communities within their wider landscape. Detailed survey and excavation work at Politiko *Troullia*, however, has looked at the relationship between the site and its surrounding environment, revealing intensive agrarian exploitation of the landscape, but an apparently otherwise isolated farming community [45]. In this issue, Webb examines the relationship between site location, economic resources (especially copper), and their exploitation in the political economy in the island’s narrow northern coastal strip: identifying Vasilia, Vounous, and Lapithos as significant nodes (or central places?) in networks linking inland copper-producing sites with international maritime networks [46].

The LC period (later second millennium B.C.) is characterised by increasing diversification of landscape use, resulting in a progressively complex settlement hierarchy and the establishment of urban centres [32]. By the 13th–14th centuries, an interrelated system of sites covered the coastal plains and the inland river valleys up to the cupriferous hilly flank zones. There has been more consideration of how LC settlement was situated within an economic landscape and, to some extent, the relationality between urban sites and the hinterland, which Priscilla Keswani has explored within a staple-wealth finance model [47]. Originally, Catling (pp. 142–143) [48] suggested a tripartite settlement hierarchy comprising the coastal (trading) urban centres and inland farming and mining sites. Knapp [49,50] and Keswani [10,47] have both refined Catling’s model, suggesting a more complex pattern of settlement use. This comprised substantial primary (urban) centres located in the coastal plain such as Enkomi, Kalavasos, and Morphou [32,33]—some dominated by imposing ashlar buildings, which possibly functioned as administrative/taxation centres—and secondary and tertiary centres in the hinterland. These “centres” were supported by numerous smaller specialist sites primarily in the hinterland, only a handful of which have been excavated. Some, such as Arediou *Vouppes* [51,52] and Analiondas *Palioklichia* [53], were associated with arable farming; others, such as Apliki *Karamallos* [54] and Politiko

Phorades [55], with primary copper production or pottery manufacture, as at Sanidha *Moutti tou Ayiou Serkou* [56]. In many ways, although not articulated as such, these settlement models conform to central place theory, as discussed above. Moreover, although archaeologists have not applied network theory to examine the interrelationship between these sites, both Keswani and Knapp [47,57] have considered the economic relationality between sites, for example, from a staple/wealth finance perspective.

This discussion of changing patterns of human occupation throughout the Cypriot Bronze Age provides us with a base point for considering the peoples' interactions with the environment; as noted above, these models layer human action onto a passive landscape, upon which they manipulated resources and created meaningful place from "empty" space [58]. In these narratives, therefore, people are detached from the environments they inhabit. The following discussion, however—which draws attention to the agency of water and suggests various watery–human assemblages—seeks to embed humans in their landscape, to better understand how the archaeological record described above might have been lived and experienced.

4. Watery Entanglements in the Cypriot Hinterland

I want now to consider how the agency of water shaped peoples' interactions with and within the environment in Bronze Age Cyprus. First, we should consider the essential materiality of water. We cannot exist without water [59]; some 55% to 60% of the matter of our bodies is made up of this substance [60] and equally it sustains the plant and animal life on which we depend. This, then, is the first of our assemblages: our bodies, the water we ingest, and the foodstuffs sustained by this substance that we consume. The process of consumption is an assemblage; we are made of and interact with water on a daily basis to survive. Water, therefore, is central to our relationship with the environment [61]. However, water does not survive as a meaningful, measurable entity in the archaeological record, but instead is transient and ephemeral, tending to trickle away or evaporate, especially in the arid lands of the Near East. Instead, archaeologists have to focus on the residual remains of human interactions with water, identifying hydraulic technologies [62] such as drains, wells, cisterns, and aqueducts. While these are regularly recorded within excavation reports, within Cypriot archaeology, there has been little consideration of how these were actually integrated within daily practices within and beyond the household [63].

As Knitter et al. [64] (p. 4) note, proximity to fresh water sources is one of the key factors determining the very location of human habitation, because it is a constant, daily requirement for survival, necessary for daily household needs such as drinking, cooking, and cleaning. Beyond the immediate requirements of the household, water had an increasingly important economic value as societies become sedentary throughout the Neolithic and Bronze Age, and as people increasingly settle at fixed points in the landscape, supporting arable farming and livestock, as well as being used in various forms of industrialised processing, including pottery production, working textiles, and metallurgy. Indeed, Strang has suggested that as communities become more hierarchically organized, water is increasingly contested as an economic asset; this is characterised by ever more complex hydraulic technologies, such as cisterns, communal wells, and drainage and sewerage systems, which are centrally organised. While the building and maintenance of these waterworks tend to be a male concern, Strang notes that the physicality of water collection typically continues to be women's work [65].

The presence of reliable water sources, such as perennial springs and rivers (Figure 2), therefore, provided desirable places for occupation for Cypriot communities throughout the Bronze Age, which developed into the settlement nodes and/or central places picked up in archaeological survey. However, as Attala (p. 80) reminds us, water is not simply "an inert material or resource serendipitously available for human consumption" [66]; its specific properties and capacities constrain the ways in which people can interact with it [67,68]. In its liquid state, water resists our attempts to handle and manipulate it, trickling through fingers and cupped hands, evaporating and "disappearing" into thin air. Strategies developed to control and constrain this ephemeral substance include holding it in pools,

cisterns, wells, and reservoirs; it can be moved around and distributed in portable containers (jugs, buckets, bottles, etc.); and its liquid capacity to flow allows it to be channelled around and between sites, through pipes and drains, and along viaducts.



Figure 2. Water flowing in the Koutis River, tributary of the Aloupos, near Arediou. Photo: L. Steel.

The earliest wells identified on Cyprus, at Kissonerga *Mylouthkia*, date to the mid–late ninth millennium calibrated B.C., in what has been termed the Cypro-PPNB (Cypro-Pre-Pottery Neolithic B) [69], and were dug by the earliest settled farming communities on the island. These wells demonstrate a sophisticated understanding of water, being dug into the *havara* bedrock deliberately to intersect underground streams [70]. Intriguingly, these skills and knowledges appear to have been lost by the later prehistoric inhabitants of the island, and there is little extant evidence for water management in the EC–MC villages excavated: no wells or cisterns have been identified, nor any drains for channelling excess rainwater. An interesting series of basins and water channels carved into the limestone bedrock has been identified at MC Erimi *Laonin tou Porakou* [71], part of a workshop complex, indicative of increasing knowledges of handling, moving, and storing water and perhaps an early attempt to control this (economic) resource. I have suggested elsewhere that people’s primary engagement with water occurred outside the settlement, presumably on the banks of the nearby water source, and that this would have been brought into the settlement in portable containers, possibly to be stored in pithoi [64]. Containers used to carry water into the settlement might have been pottery jugs, which are plentiful in EC–MC settlements, or otherwise made from perishable materials such as leather or plaited basketry, as suggested by ethnographic analogy [72]. Daily activities would include collection of water for drinking, cooking, and cleaning. Unfortunately, while the settlements have been well excavated and published in detail, their associated water sources have not been the focus of fieldwork; moreover, these were ephemeral activities, which would have left little archaeological trace.

In the Late Cypriot (henceforth) LC period, however, there is a very different level of engagement with water within the settlement, reflecting increasing emphasis on it as an economic resource. Wells and cisterns have been excavated at a number of sites, physically anchoring sites in the landscape. Rather than following water where it flowed, this substance was tamed and contained within the settlement and peoples' activities were fixed accordingly. The wells were usually located inside individual buildings, households in the urban centres, and at the agricultural settlement of Arediou (Figure 3) in a small room attached to a well-built barn. I have previously noted (p. 522, n. 71) that communal water places, namely wells in open spaces within the settlement, have only rarely been identified [53], which I argue is indicative of the economic importance of water and consequently a will to control access to this resource. Drainage systems were also developed, to allow run-off of heavy rainfall during the winter months. These hydraulic technologies largely parallel those identified by Calvet in Late Bronze Age Ugarit [73,74], pointing to the introduction of new practices from the northern Levant. There is no evidence, however, that water management was centrally controlled in the LC towns: there was no systematised drainage system removing waste water from houses, nor any provision for piping clean water around the settlement. Instead, water management remained at the level of the household. Elaboration of water systems, possibly apparently associated with bathing, is evident in a small number of monumental buildings in the major urban centres. The earliest, dating to the 14th century B.C., is the so-called Basin Building at Maroni *Vournes*, which comprises a large sunken basin lined in stone, which the excavator (p. 16) has compared to a Minoan lustral basin [75]. Hitchcock (p. 12) also draws attention to the elaboration of a 12th century bathroom in House A at Hala Sultan Tekke, with a sunken basin paved and lined in ashlar masonry, the interstices of the paving lined with a lead waterproof filling [76]. There are also elaborate drainage facilities attested in Building II at Alassa *Paliotaverna*, compared by the excavator (pp. 434–435) to the water systems in the Palace of Knossos [77]. Although these examples clearly demonstrate considerable skills in working with water, this was not made available to the wider community, but remained inside (and controlled by) what might perhaps be considered to be elite households. Nonetheless, we can see that human–water interactions were transformed in the later second millennium. Water had become an urbanised resource, something that could be owned, controlled, manipulated, spatially confined, and, in a sense, dominated.



Figure 3. LC well in Building 2, Arediou *Vouppes*. Photo: S. Thomas.

5. From Networks to Assemblages

Returning to shifting inter-site relations in the Cypriot landscape during the Bronze Age, we will now look at the island's river systems. Traditional landscape studies might consider the relationality facilitated by the waterways as interconnecting networks (see above). The following discussion, however, will focus on multiscalar assemblages, from a single object (a boat) to the settlements identified through survey and excavation. As noted above, the location of Bronze Age settlements was predicated by access to a secure water supply and good arable land, able to support the populations of villages and towns. Drawing upon Devillers' detailed geomorphological study [78], Michael Brown has made the case that the waterways of eastern Cyprus were at least partly navigable during the Bronze Age [79]. The Alykos–Gialias–Pedieos river system was particularly important for movement east–west traversing the Mesaoria plain and connecting sites on the east coast with the cluster of settlements scattered around the northern edges of the Troodos [80]. Other rivers radiating from the Troodos mountains plausibly connected the interior directly down to the coast, at least during the wetter part of the year; for example, the Aloupos River in the northwest linking the Politiko–Arediou cluster of sites with Morphou Bay [81] and the Kouris River linking Alassa and Episkopi; moreover, if dry in the summer months, the riverbeds would provide an easy route for travel on foot or with pack animals. These rivers did not provide connectivity *across* the landscape, which would have been negotiated on foot (or by wheeled transport?) over the flat coastal plains; however, the extensive rugged terrain of the Troodos mountains effectively cut the southwest coast from the rest of the island, with a largely impassable limestone plateau plunging into the sea between Episkopi and Palaepaphos (Figure 4), and by necessity, the settlements in the southwest would have communicated with the rest of the island by seagoing vessels hugging the coastline. Although there is no evidence for built harbours, Knapp (pp. 84–85) notes that several potential harbourages have been identified along the south coast between Palaepaphos and Hala Sultan Tekke [82].



Figure 4. View from Kourion of limestone plateau and cliffs. Photo: L. Steel.

Although the boats used to navigate these waterways and the shallows of the Cypriot coastline have not survived, we might suggest their existence from occasional models crafted from clay, the earliest which seem to represent rivercraft, although Knapp (p. 82) [82] expresses some reservation whether these early models do in fact represent boats. Wachsman (pp. 62–64) [83] has suggested that the earliest of these, a Red Polished model, as well as a small number of MC White Painted boat models, probably represented coracle-like vessels or basket-boats, the incised and painted network designs perhaps indicating the basketry framework. The example from the Louvre (Figure 5) apparently suggests a vessel of considerable size, which might represent a larger, possibly seagoing, craft [84], although we should note that the traditional Iraqi *quffa* (or *kuphar*) could be large enough to hold several individuals and transport goods, building materials, and livestock [85]. There is more reliable evidence for the LC period in the form of three Plain ware models of an apparently more complex watercraft, which Wachsman [83] identifies (p. 66) as a type of spacious seagoing vessel, or merchant ship of indigenous design, and at the end of the LC period, there are graffiti of seagoing vessels on the walls of Temple 1, Kition [82]. Seafaring technologies enabling communication within the wider Mediterranean undoubtedly had spread to the island by the LC period, evidenced by an ever-increasing influx of traded commodities from the Aegean and the Levant, illustrating Cypriot participation in long-distance maritime trade. The importance of seafaring is indicated by the many anchors found in LC coastal settlements and anchorages as well as in the sacred precinct at Kition [83]. The waters of the Mediterranean also brought incomers, merchants visiting the island, settling and bringing with them new objects and knowledge of novel ways of doing things—including writing, seal stones, wheel-made pottery, and monumental architecture [32]—these changes were intrinsically associated with the development of the LC coastal centres and, as Knapp (p. 133) argues, illustrate the emergence of an urbanised and socially stratified society [33], transforming the way of life on the island. I would contend that it was through increased engagement with seafaring technologies and the resulting watery interactions within and beyond the island that such changes were enabled.



Figure 5. White Painted ware model of boat with crew, AM 972. Courtesy of the Louvre.

How then can we bring these diverse levels of archaeological data together to explore changing patterns of settlement and inter-site relationality in the Cypriot landscape? First, we might consider the boats as assemblages, the temporary coming together of material and immaterial entities during the process of their crafting. These entities include the materials from which the boats were crafted (including basketry and a waterproof (leather?) covering for the basket-boats, timbers, linen sails, twine for ropes, bitumen, etc. for seagoing vessels), the capacities of these materials informing the haptic skills of the craftsmen who procured and worked with them, their intangible knowledge, and the tools that they used. Once complete, these rivercraft and seagoing vessels were incorporated within other assemblages: the waters through which they moved, the crews which manned them, their knowledge of moving safely through water, navigational skills, communication skills as they moved between communities (the archaeologists' nodal points in the landscape), and the cargoes they transported. The relationality of these communities scattered throughout the Cypriot landscape can also be considered as multiscalar nested assemblages, comprising myriad interwoven connections within connections. The boats themselves comprise an assemblage with their own emergent properties. These were then incorporated within larger assemblages: the waterways, settlements, and their communities comprise diverse material and immaterial elements coming together, comingling and interacting, and the processes by which the diverse entities came together in turn created new (im)material connections. Water therefore facilitated the spread not just of goods and materials between communities (copper, finished metal artefacts, pottery, and textiles might all have been traded), but likewise, the movement of people inevitably entailed the sharing of ideas, news, knowledge, and new ways of doing things. We should not, however, discount terrestrial movement with pack animals, wheeled transport, and on foot as other assemblages, perhaps moving along dry riverbeds in the summer months, thereby again benefitting from the agency of water. Thus, the village and urban communities of the Cypriot landscape, and the social structures within them, emerged from the relationships within these multiscalar assemblages and, I would argue, the material agent bringing together these entities was water. This substance both provoked and enabled activities on the part of the human agents in the assemblage and ultimately shaped the Cypriot landscape.

The very establishment and continued growth of the EC–MC large village communities in the foothills of the Troodhos therefore was enabled by these sustaining and interconnecting waterways, as was the later development of the coastal LC towns, which traded Cypriot copper and other goods and commodities produced in the hinterland beyond the island. These waterways connected communities, bringing inland and coastal communities together, facilitating the movement of people, livestock, raw materials such as copper, finished goods, and ideas over considerable distances in the Cypriot interior north of the Troodhos foothills, in a wooded landscape (as illustrated by charcoal analyses from Politiko *Troullia*) [86], which might thus have been impassable or at least difficult to negotiate on foot. Furthermore, understanding the importance of waterways for communication also allows us to envisage the riverside by the settlements as lively, bustling, and exciting places, with people (family, friends, strangers) coming and going, bringing with them goods, news, and ideas.

6. Conclusions

This paper considers the changing shape of the Cypriot landscape throughout the Bronze Age, transformations that have typically been presented within a cultural historical framework, identifying urbanisation in the later second millennium BC with greater social complexity and, above all, increased exploitation of the island's copper resources. Notwithstanding, I have sought to demonstrate the value of the new materialisms for interpreting the complexities of the archaeological record. Specifically, I have focused on how water and people were entangled in ever-changing assemblages and thus how the agency of water shaped peoples' interactions within the environment.

In contrast to traditional landscape archaeologies, which present space as passive and inert or as nodal points and central places marked on a two-dimensional map, and which are only ascribed meaning (becoming place) through human action, the new materialisms encourage us to think about

humans as one of many matters shaping the material environment. Here, I have explored how Bronze Age settlement was not simply imposed upon the Cypriot landscape through human action, but instead was enabled by the presence of water, as were the associated agricultural, pastoral, and industrial practices sustaining these communities. Throughout the EC–MC periods, water remained untamed and peoples' primary interactions with this substance occurred outside the built area of the settlement. By the LC period, however, changing water management systems accompanied the development of larger coastal towns, which I suggest was influenced by increasing contact with the urban communities of the northern Levant. This article also considers relationality between settlements, but moves away from the static lines and arcs of network theory to think about connectivity and relationships as assemblages, which, depending upon the emergent properties of their constituent parts, are always in flux. Assemblage theory allows us to incorporate different levels of archaeological data normally treated separately, from materials to object, to the built environment, and up to the wider landscape. This approach allows us to reflect upon how connectivity and communication between the Cypriot Bronze Age settlements might have been facilitated by water, namely the riverine system. Engagement with waterways and the development of increasingly advanced boating technologies allowed the movement of people, goods, and materials (such as copper) into and around the interior, and by the LC period, beyond the island. Although the aim of this paper has been to highlight the agency of water, we should of course remember that other agents, such as dry riverbeds, pathways, pack animals, and wheeled transport, also played an important role in connecting communities. Ultimately, my aim has been to demonstrate that archaeological sites themselves are not inert, passive points, simply situated or located in a two-dimensional archaeological landscape. Instead, they represent ancient communities, made up not just of people and their built environment, but of many different immanent materials, which variously emerged and acted with and upon each other to dynamically coproduce the material world.

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Article

Central Place and Liminal Landscape in the Territory of Populonia

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Abstract: This article aims to outline new data on the urbanization of Populonia starting from its foundation, with particular reference to the results of archaeological surveys carried out by the University of Siena since the 1980s. The landscape archaeology approach has allowed us to reconstruct the Etruscan city's organization of settlements as well as its management of resources. In addition, this investigative tool has proven the most effective method to detect both places of economic or ideological centrality and specific liminal landscapes in the territory of Populonia. The urban development of the Etruscan city represents an anomalous case for several reasons that are mainly dependent on its shape, which required unconventional choices in the organization and management of its territory and natural resources. Our research leads us to suggest that the Etruscan city's acropolis seems to have played the role of central place starting right from the establishment of the city. Within some of the new acquisitions coming from my PhD research we have to consider the feature of the hilltop fortresses system and the detection of a "liminal landscape" in the northeastern stretch of the territory between Populonia and Volterra. This particular part of the landscape had been a sacred district with a strong peripheral character and possibly close connections to the central place thanks to the significant availability of natural resources.

Keywords: landscape archaeology; Populonia; settlement organization; supply basin; central place; hilltop fortresses; liminal landscape; connectivity; viewshed analysis; sacred areas

1. Introduction

This paper aims to outline some of the most important phases of Populonia's urban development starting from its foundation, with particular reference to the results of archaeological surveys carried out by the University of Siena since the 1980s. My new data on the urbanization of Populonia is one of the most significant results of my PhD research project focused on the development of the Populonia frontier and territory with respect to the neighboring Etruscan centers of Volterra to the north, and Vetulonia and Roselle to the south. To pursue this goal, I reconstructed both the organization of the settlements and the management system of resources applied by Populonia on the *longue durée*, moving from the Late Bronze–Early Iron Age to the Hellenistic period. In this paper, I concentrate on the period between the 6th century BC to the 3rd century BC, before Populonia was incorporated into the Roman Empire.

From this point of view, my PhD research could be included in the general branch of knowledge concerning the definition of the political and ethnic frontiers between one or more communities. Although the human need to establish cultural-group borders already existed long before, it was only starting from the end of the 19th century that the frontier became a subject of study. Some scholars investigated this field by making historical border reconstructions, within the context of military interests of colonialism and nationalism politics [1] (p. 23). F. J. Turner, on the contrary, studying

the frontier in American history, interpreted it entirely as free lands to colonize, taking no interest in indigenous people living there [2]. From the 1950s, when most European colonies gained their independence, some scholars, such as Owen Lattimore, considered the frontier as the area of interaction between people from different cultures [3]. The scientific debate of the 1970s saw the predominance of both the core–periphery model and the emergence of the world system theory [4], well-suited to explain the hierarchical organizations of trade connections in the world. In terms of archaeological perspective, this system was the first theoretical model that tried to explain the influence of the contacts between different communities on promoting cultural changes in specific ethnic groups [5–7]. During the last two decades of the 20th century, some areas of research highlighted an idea of the frontier as a permeable meeting zone and cultural exchange area depending both on the flexibility of the political authority and the elasticity of its territorial control [8,9].

Although political frontiers can be considered some of the most visible evidence of ethnic identity in pre-Roman central Italy, my study specifically deals with political frontiers on the sub-regional level [10]. As G. Cifani, L. Ceccarelli and S. Stoddart note, “In pre-Roman Etruria, as a general rule, we can say that frontiers take a number of forms depending on the configuration of the power centers, the physical circumscription of the area and the topography of the landscape” [10] (p. 164).

The need to study and define the territorial limits of specific communities requires the interaction with other scientific approaches, such as spatial archeology and landscape archaeology, specifically to understand the ways in which people in the past constructed and used the environment around them. The first approach encourages the application of both modern geographic-economic models and statistics to archaeological evidence in order to interpret site distributions in the landscape [11] (p. 9). Among the most interesting interpretative models, we have to mention: (1) the Early State Module, applied at first to Mycenaean Greece state societies, then to Etruscan cities [12] (pp. 3–59); this method was recently implemented by the XTENT model that permits variations in the size of territory, also evaluating the “friction” of the physiography of the landscape [13]; (2) the Thiessen Polygon Method, to describe settlement patterns based on territorial divisions centered on a single site or feature; (3) the peer polity interaction to explain change in society and in material culture [14]. A recent update is also the landscapes of power theory that aims to develop analytical models to simulate and study political arrangements of ancient territories. This approach intersects various disciplines, such as social archaeology, anthropology and geography [15–17].

Landscape archaeology is an area of study that surpasses the conventional boundaries between disciplines and provides a fresh perspective and a powerful investigative tool to address research questions related to the conscious and the unconscious shaping of the land and the process of organizing space, involving interactions between the physical environment and human presence.

Landscape is never inert: people are directly associated with it, rework it, appropriate it and contextualize it [18] (p. 3). As Ashmore notes, “prominent among the meaning of landscape are power and identity, variously defined and expressed in sundry forms” [19]. As landscape delineates memory and declares identity, the land itself plays a fundamental role in social-cultural order and in human relationship [20]. Furthermore, “as a community merges with its habitus through the actions and activities of its members, the landscape may become a key reference point for expressions of individual, as well as group, identity” [21].

Thus, the methodological approach chosen to carry out the detection of Populonia frontiers and the development of its territory was basically multidisciplinary and it derived from: (1) a detailed collection of records and knowledge coming from different sources, such as archive documents, historical and epigraphic sources, as well as archeological and geological data; and (2) the setting-up of a specific geographic information system, capable of storing, managing and analyzing the different kinds of data and displaying them on a map.

Since the 1980s, thanks to the results from archaeological surveys carried out by the University of Siena, research on the territorial organization of Populonia has improved and the landscape archaeology approach, as a whole, has shown itself to be the most effective method of identifying the

structural context of Populonia (Figure 1). The detection of a specific liminal landscape as well as the feature of the hierarchical fortified system are some of the new data coming from my PhD research. They also contribute to recognize Populonia’s places of economic or ideological centrality as well as to re-evaluate “marginal landscapes” in the surrounding territory.

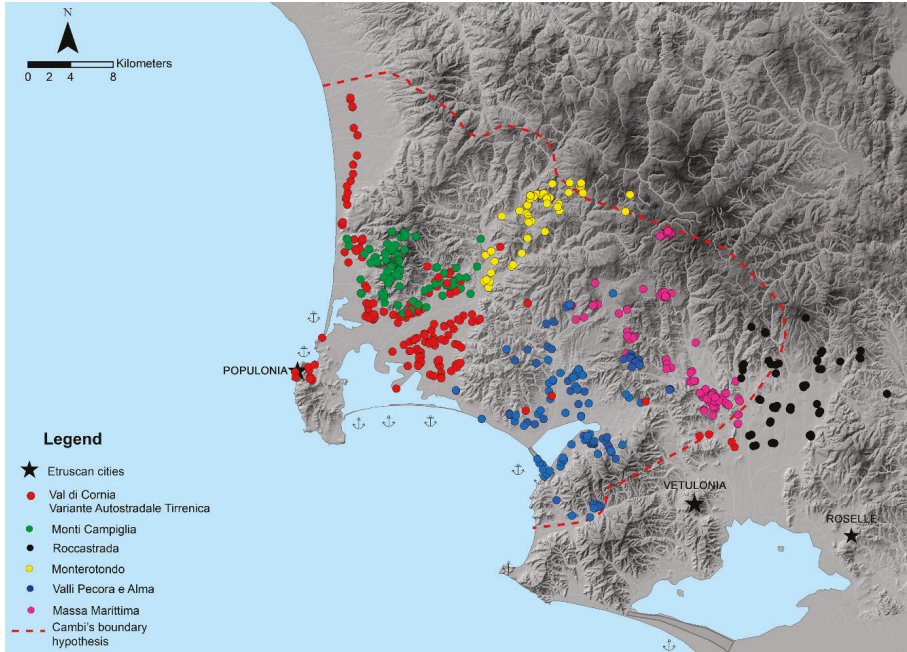


Figure 1. General map of archaeological surveys in the territory of Populonia undertaken by the University of Siena since 1980s.

2. The Birth of Populonia in the Early Iron Age and its Urban Development

The urban development of Populonia represents an anomalous case for several reasons that are mainly dependent on its shape, which required unconventional choices in the organization and management of its territory and natural resources [22] (Figure 2).

Firstly, Populonia was the only Etruscan city that was directly on the coast. It occupied the hills of Poggio del Telegrafo and Poggio del Castello and overlooked the Gulf of Baratti. During the 5th century BC, when the territory of Populonia reached its maximum expansion, it stretched approximately from Donoratico to the north and the Alma River to the south of the Piombino headland [23]. In ancient times the landscape was very different: there were many coastal lagoons that, particularly in the Piombino area, made the headland into a particular kind of peninsula [24,25]. The Populonia surrounding was highly varied: it was characterized by a succession of hills and flat lands, by the presence of hot sulphur springs and was traversed by many rivers. Thus, the city benefited from a territory with great potential, rich in natural resources. The coastal lagoons served numerous functions: they supplied fundamental food resources, for instance, here fish were farmed and salt produced; they provided harbors for medium-size boats; they served as protective-climate areas during winter grazing along the transhumance routes and during cultivation cycles of grain and trees [26,27]. In addition to this formidable food supply, Populonia could draw on other resources in the form of mixed sulphides and iron ore extracted from the quarry of the Campigliese district and the Island of Elba, as well as the Buca delle Fate site.

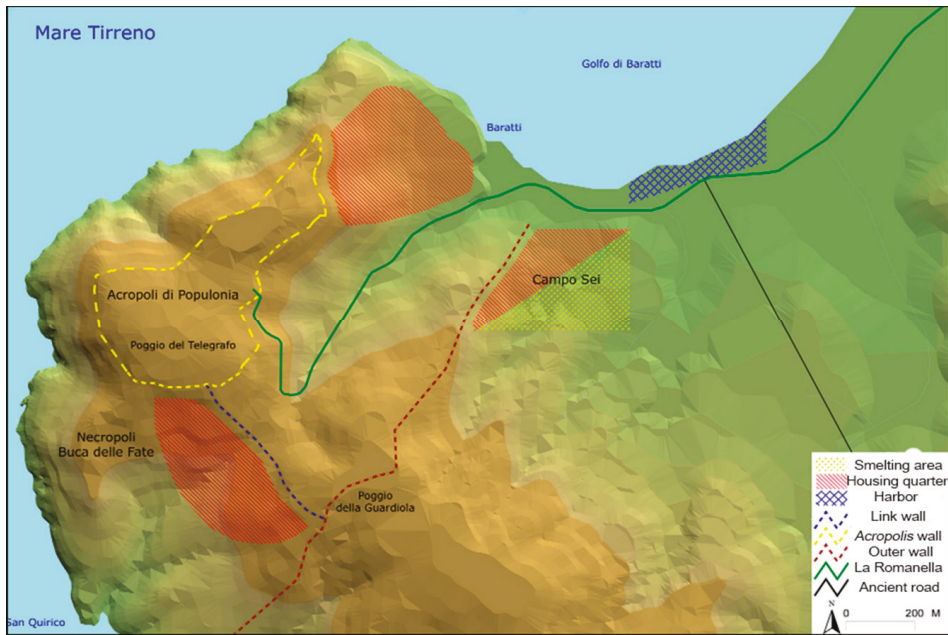


Figure 2. Populonia: the acropolis site. The Early Iron Age Poggio del Telegrafo settlement.

Secondly, there are not many literary sources about Populonia, but one of the most interesting legendary traditions is referred to by the Late Antiquity writer Servius, who indicated Populonia as the last city founded among the Etruscan centers; he also suggested three possible proveniences of the founders: as settlers from Corsica, or from Volterra, or as a group that forced out a previous community. Although this source is not easily verified, the hypothesis of a close relationship between the Island of Corsica and Populonia might be deduced from the analogies of specific material culture and funerary practices during the 9th and the 8th century BC [28]. It is significant that the same analogies can also be identified in the Iron Age material culture, including both imported and imitation goods [29] as well as funerary practices from Sardinia and the Island of Elba. Some rituals present here have been directly attributed to Sardinian and Corsican influences: for instance, the early adoption of burial rituals and the practice of burying a group of people in caverns or natural clefts spread throughout the Island of Elba and is well attested in the Riparo Biserno site (San Vincenzo-Livorno). A high level of connectivity must have linked these local communities. Thus, it is likely that the maritime trades in this part of the Tyrrhenian Sea were controlled by clan families who lived in Populonia, and on the Islands of Elba, Corsica and Sardinia. The situation could also be proved by the lack of material culture coming from areas external to this specific trade network [30]. In the late Iron Age, Vetulonia took part in this trade network, too and it seemed to be in competition with Populonia [31] (p. 286). The Island of Elba, in all probability, was included in the Populonia dominions at least from the Early Iron Age, if not before [32]. The Villanovan Populonia appears to be the hub of a geographical district rich in resources and not only as a crucial junction of Tyrrhenian passage but also of the main Mediterranean routes [22].

Thirdly, the growth of Populonia seems to differ slightly from the “city-territory” model, or *urbs-ager*, based on the city’s prevalent role over its countryside. Populonia appears closer to the example of some Magna Grecia colonies’ territorial evolutions, such as Metaponto [33], characterized by a strong dualism of the political center on the acropolis and the surrounding lands. This duality is highlighted by the analysis of the relationship that the city established with its supply basin [26]

(p. 73). In the Late Bronze Age, the top of the Piombino headland was unpopulated. By contrast, many small settlements appeared along the coastline and in the Campigliese district. Based on our current knowledge, the biggest coastal settlement was located on Poggio del Molino: we can probably link the Villa del Barone necropolis to this site, which was found less than 500 m away [34]. Revealed through chance archaeological finds, the other coastal sites—Villa Salus [35], Riva degli Etruschi [36] (pp. 123–124), La Torraccia [36] (p. 125), Centro Velico/Casone [37] and Torre Mozza [36] (pp. 125–126)—could be interpreted as small specialized manufacturing settlements. The only site we can be sure of, in terms of its kind of manufacturing activities, is the Centro Velico/Casone site where salt was extracted [31]. In the Campigliese district, rich in mixed sulfides and iron ore, the sites had the specific function of controlling mining activity: a clear example is the Vallin del Mandorlo settlement [38] (Figure 3).

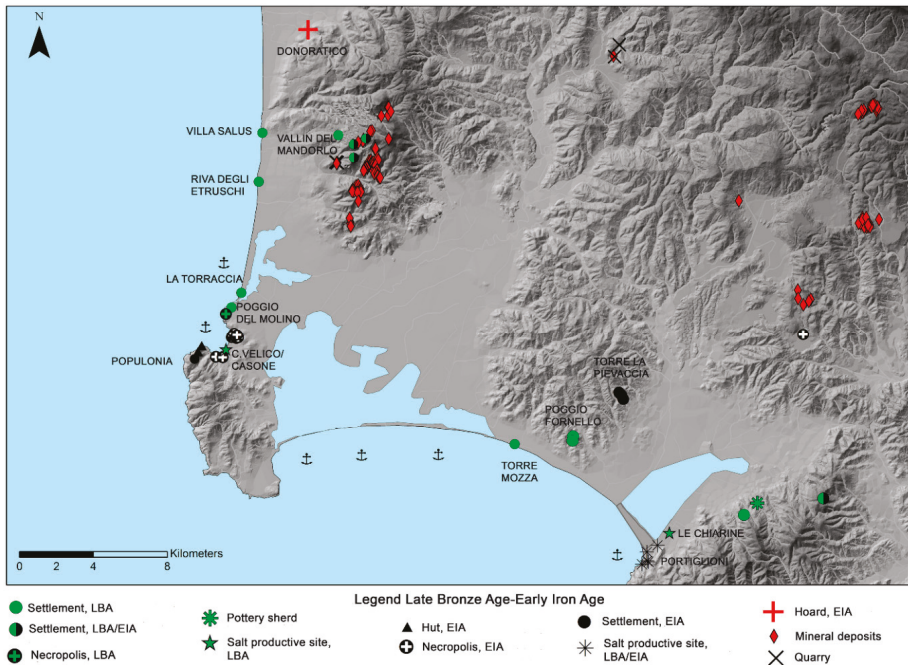


Figure 3. GIS general map of Populonia’s settlement distribution during the Late Bronze Age and the Early Iron Age.

In the Early Iron Age, the area of the historical city, corresponding to Poggio del Telegrafo and Poggio del Castello, was populated by a community with evident status markers and segmented into family clans, as archaeological data suggest [39]. This site was chosen because of its dominant and naturally defensible position overlooking neighboring territory, the port, the Gulf of Baratti as well as the ancient coastal lagoons and the Island of Elba and, with good weather conditions, the Island of Capraia and Cape Corse [40]. The time period of the city’s early development seems to correspond to the abandonment of the Late Bronze Age settlements along the coastline. Although archaeological evidence is lacking, some argument for this interpretation can be made at least for the Gulf of Baratti area, where the necropolis overlaps the previous settlement. It is possible to relate this phenomenon to the simultaneous concentration of the population in the historical city area, as part of a larger commitment to planning, which also involved the gulf [22] (p. 61). The arrangement of the Early Iron Age necropolis was anomalous in comparison with other Etruscan cities, such as

Veio, Tarquinia, Cerveteri and Vulci, where the funerary areas entirely enclosed the settlements [41] (p. 105). Because of the particular shape of the ancient coastal landscape, the necropoli were laid out on the most unencumbered areas facing the Gulf of Baratti and thus Populonia was surrounded by them [22] (pp. 66–68). While the proto-historic settlements were almost completely abandoned, the small Campigliese sites persisted and controlled mining activities [42], establishing the great dualism between the acropolis site and the resources of the neighboring countryside. It is not always clear whether the urban acropolis site was more influential on the chora, endowed with a variegated supply basin, or if the opposite [26] (pp. 73–74) was true. In spite of sparse archaeological data after its establishment, Populonia promoted a hierarchical settlement system, centered on a network of sites and on the foundation of new population centers, in keeping with most of the Southern Etruscan cities. In this respect, the common burial ground at the Riparo Biserno site (Livorno) and the Monte Pitti necropolis are particularly relevant during the Iron Age. The first, joined with the archaeological evidence from the small Campigliese sites, proves the existence of a network of minor settlements in charge of mining activities [22] (Figure 4). Even without knowing which settlements were tied to the Monte Pitti burial ground, we can still presume that it had been sited in a strategic position, probably to control access to the Campigliese mineral basin. All of these evidence-based considerations lead us to presume that, starting from the Early Iron Age, the acropolis settlement can be considered the central place: the community living there represented a catalyst for employing resources from both the Campigliese district and the surrounding supply basins.

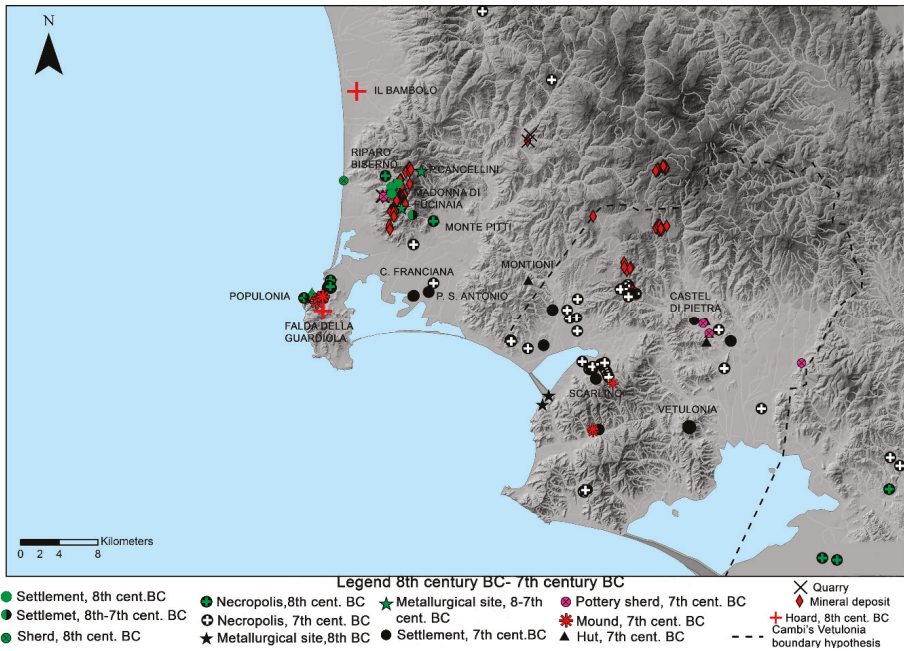


Figure 4. GIS general map of Populonia’s settlement distribution during the end of the 9th/the beginning of the 8th century BC and the first half of the 7th century BC.

3. From the Archaic Period to the Hellenistic Period

In the 6th century BC, two important events occurred in Populonia: (1) dwellings disappeared in the acropolis area, probably connected with a change in the social and economic order. From this period onward, in fact, the acropolis seems to have been used as the ritual core of the town [39];

(2) the beginning of intensive metallurgical activities in the lower town, in particular on the slopes of Poggio della Guardiola and Poggio della Porcareccia, especially from the end of the 6th century BC [43]. This phenomenon suggests a radical change in the social order, which had to adapt aristocratic assets to the needs of a dynamic system, marked by the emergence of a new middle-class employed in intensive iron smelting operations [44]. This development is well-documented by the funerary evidence and the inscriptions, nevertheless other important changes followed during the same period.

First, Populonia laid out some sacred sites to mark the transition with its suburban areas and its countryside (ager) [45,46]. Second, the Campigliese district was fortified with many hilltop fortresses sited not only topographically in connection to mineral ore, but also peripherally, to control both mining activity and access to the area's basin (Figure 5). The fortification of the Campigliese district suggests Populonia's need to protect the local mineral deposits against possible enemy incursions. Looking at the historical events known for this period, we can presume that the hilltop fortresses were built after the Alalia naval battle (540 BC) fought between the Etruscan/Carthaginian alliance and the Greek Phocaeen colonies of Alalia for control over the Northern Tyrrhenian Sea [23,47].

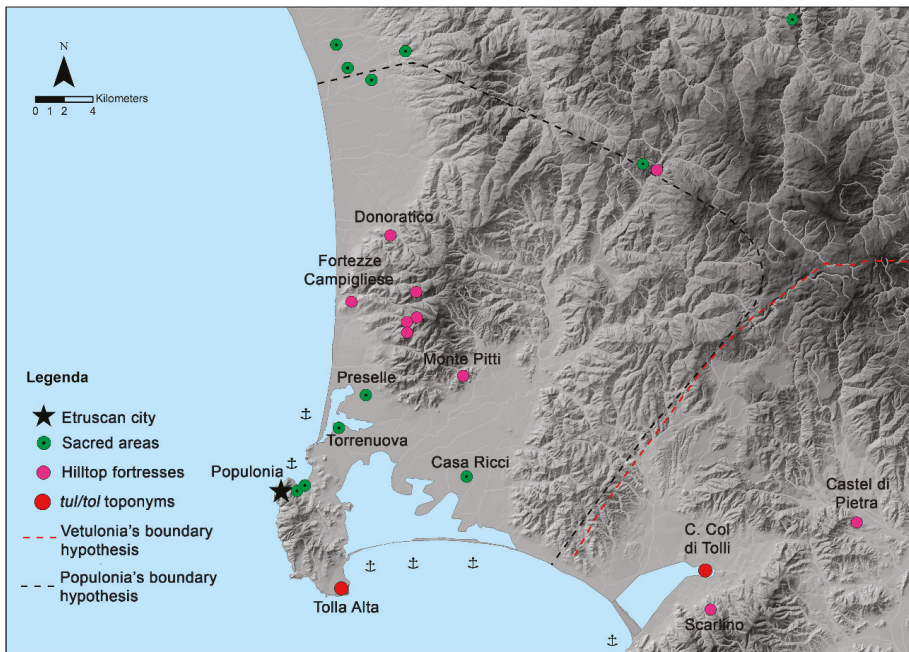


Figure 5. The distribution of the hilltop fortresses and the sacred areas of Populonia's territory in the 6th century BC.

From the 5th century BC, according to some accounts, Populonia's fortunes intertwined with the decline of Vetulonia and with the likely extension of Populonia's and Roselle's territories at the expense of the diminished city [48,49]. A closer look at the settlement arrangement of the Populonia territory highlights two facts that seem to support this hypothesis: (1) the establishment of the sacred area of Marsiliana [50,51], located along the route to the Massa Marittima ore deposits, might suggest the Populonia takeover of this mineral district [23]; and (2) the planning of a strategic fortification system that involved both the Italian peninsula and the Island of Elba: in the case of the mainland, some hilltop fortresses were sited on its territorial borders [26,52,53] (Figure 6).

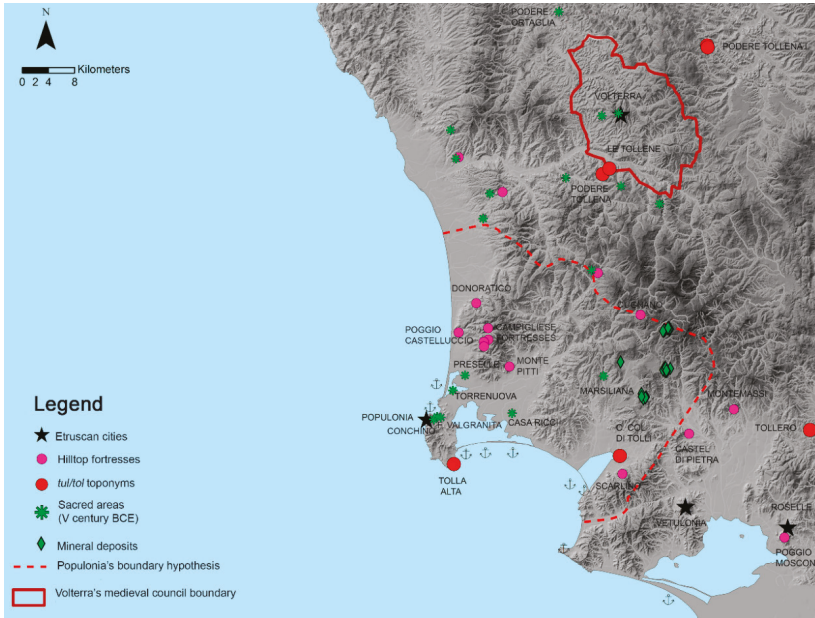


Figure 6. GIS general map of Populonia’s sacred areas and hilltop fortresses distribution during the 5th century BC.

Populonia implemented the remarkable hilltop fortress system during the late 4th and early 3rd centuries BC, when the pronounced Roman interest in Northern Etruria’s territories, particularly in the period between 311–283/282 BC, provided the foundation for the development of fortified hilltop settlements in Populonia’s territory [26,52,53] (Figure 7).

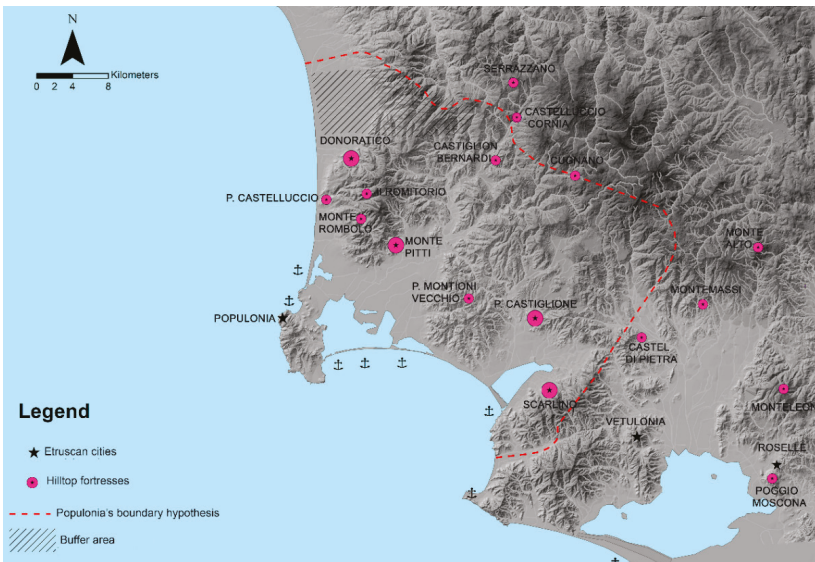


Figure 7. GIS general map of Populonia’s hilltop fortresses distribution during the Hellenistic period.

The chronological sequence of events mentioned by Livy corresponds to diagnostic pottery and material finds discovered during archaeological excavations undertaken in a number of Populonia's hilltop fortresses. Considering the lack of a specific denomination in classical terminology, the term "hilltop fortress" allows us to contextualize the Island of Elba's archaeological structures within an architectural and structural category. An examination of texts by classical authors provides some terms we might adopt to describe the archaeological evidence found on the Island of Elba, such as *φρούριον* and *castellum*, since both denote "a fortress, a secondary camp in defense of a principal one or a strategic site, even a warehouse." This type of site arose in response either to an imminent military threat or to various phases of imperial expansion and the position was often abandoned after such threats had passed [26,52,53]. Before analyzing the characteristics of these settlements, we must examine the two factors that affect the topic of Populonia castella: (1) the majority of hilltop fortresses are known only through archaeological surveys; and (2) the medieval castles' overlapping of Etruscan bastions [23,47]. On this basis, we can offer some hypotheses concerning the settlement structures and their role within the defensive system. In light of the archaeological data, it is possible to note a number of main features shared by these fortified settlements. First, they are located on a cleared hilltop in a strategic position, providing control over travel routes; mineral, agricultural, and maritime resources; and crossroads. They were also surrounded by stonewalls for additional defense. These settlements were rectangular in plan, presumably to rectify the peak outlines and to bestow a quadrangular plan. Their construction technique, for the most part, involved the placement of rough-cut stones arranged in irregular rows; the walls were also endowed with a brick base and a clay court elevation. Inside the defensive walls, the buildings, about one hectare in area or less, were well structured. All of the fortresses were furnished with tanks for water conservation and areas for storing other supplies; the houses were made with clay elevations and covered by a tiled roof supported on a timber frame [52,53].

Set apart from each other at regular intervals of 9–10 km, the fortresses on the peninsula created a sort of defensive ring placed some distance inland from the coastline. In this way, the fortresses, either individually or in sets of two, could control a specific area or resource. As we can see through the ArcGIS viewshed analysis, their sphere of influence included direct control over the Colline Metallifere mineral deposits [52,53]. The pottery record of the majority of the castella shows strong analogies to Populonia ceramics. On the basis of archaeological evidence, the local products generally seemed to prevail over imported goods. On this subject, we must mention a small group of tombs related to the Monte Pitti fortress. Here the grave artifacts are quite significant and include imported fine pottery and jewelry [54]. It is evident that Populonia created a hierarchical fortified system. On the mainland, the sites that can be considered at the top of the hierarchy, especially in terms of strategic importance, include Donoratico, Monte Pitti, Poggio Castiglione, and Scarlino. On the Island of Elba, on the contrary, the defensive network was characterized by two hilltop fortresses (Monte Castello and Castiglione San Martino) to which small-fortified settlements were linked. Finally, ArcGIS viewshed analysis indicates that all of the fortresses were in direct visual contact with each other. In addition, the results of the latter study serve both to question and increase our knowledge about the controversy concerning the supposed reconstructions of ancient boundaries between Populonia, Vetulonia, and Roselle. In fact, the viewshed analyses show that the castella of Poggio Castiglione and Scarlino were visually connected to Populonia and its territory. On the other hand, the fortresses of Castel di Pietra and Montemassi have a reciprocal visual connection with Poggio di Moscona, which has recently been numbered among the *φρούρια* in the territory of Roselle. These hilltop fortresses were only abandoned between the mid-second and first centuries BC after imminent military threats in the region had diminished and the area as a whole was slowly Romanized [26,52,53].

It is reasonable to consider Populonia's strategically placed hilltop fortresses as a reaction to danger and threat and, simultaneously, as the outcome of surplus wealth, which would certainly have been required to realize the fortified settlement systems. Thus, we can imagine that the Classical and the Hellenistic landscape both on the mainland of Populonia and on the Island of Elba had assumed

particular features as a “landscape of prosperity and of worry” [23,47]. The central place is again concentrated on the Populonia acropolis which, endowed with an upper wall, became the main focus of the fortified settlements and the stronghold of the territorial defense. Its strategic position allowed a reciprocal visual connection among most of the hilltop fortresses in the Campigliese district and on the Island of Elba [55] (Figure 8).

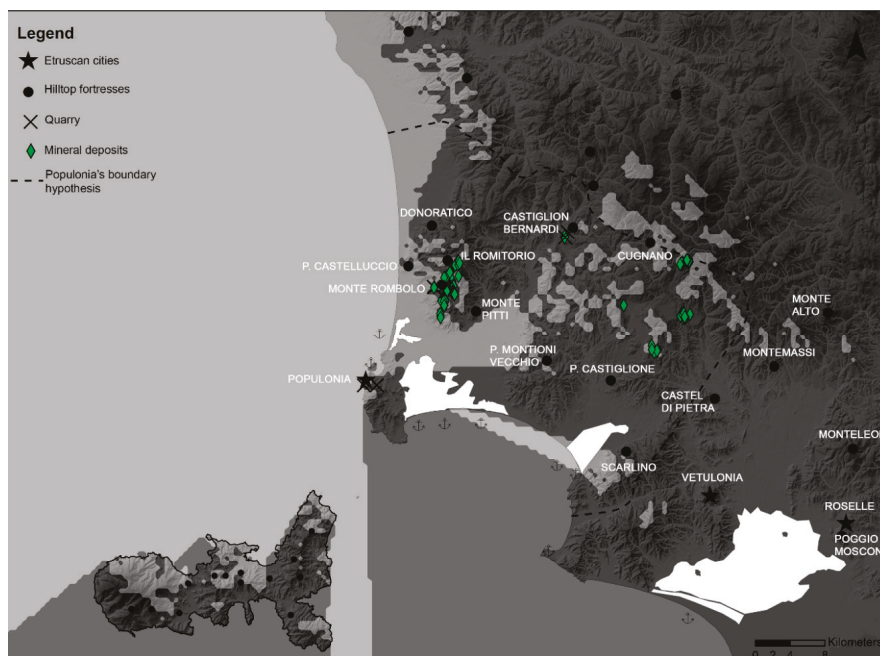


Figure 8. GIS viewshed analysis map from Populonia.

4. A “Liminal Landscape” in the Territory of Populonia

The term “liminal” comes from the Latin word *limen*, which means border. The Concise Oxford English Dictionary defines liminal as an adjective relating to a transitional or initial stage or at a boundary or threshold [56]. Thus, there are different meanings and connotations linked to this word. Arnold van Gennep was the first scholar who used the term “liminal” in his analyses of rituals. Within transitional rites, he distinguishes three categories of rites—preliminary, liminal and postliminal—connecting each one to a different stage in human life. In the second chapter of *The Rites of Passage*, he discusses territorial passage, analyzing the rituals used when entering the neutral grounds between marked territories [57]. Van Gennep’s ideas were further investigated by the social anthropologist Victor Turner, who concentrated on the liminal phase of initiation rituals, with particular attention to related social and symbolical aspects [58].

“Liminal landscapes” are geographical areas set in rougher topographic environments such as mountains, forests, heathlands, wetlands, coastal areas and arctic zones. [59]. To inhabit a liminal landscape has frequently implied the need to adopt particular ways, structures and routines of living. Basically these different results consist of: house construction using raw perishable materials, land reclamation work, flow regulation work and terracing [60] (p. 9). Liminal landscapes are often associated with nature and the relative wilderness lying beyond cultivated spheres. Such associations have contributed to the downgrading of liminal landscapes’ historical, cultural and social importance in society. Moreover, these outlying areas are generally considered passive (as compared to an

active center) and are thus judged to be marginal also from a social perspective. From the local inhabitants' viewpoint, the same landscapes, even when they are hardly marginal, are central in terms of subsistence strategies for the local people. The marginal landscapes of today were not necessarily the marginal landscapes of the earlier times [59]. Thus, the concept of "liminal" becomes an issue between relative points of view. Some archaeologists are currently working on the intensive exchange connections and tight cultural material proximity existing between central or hegemonic areas and marginal or subordinate zones. In a new perspective, we can see new connectivity trajectories not only between different cultural geographic areas but also among elements that traditional viewpoints considered opposite, i.e., fortified cities and countryside vs. eschatia, Roman century vs. saltus, citizens and peasants vs. pastores [60] (p. 6). Thanks to the influence of P. Horden and N. Purcell's book, *The Corrupting Sea* [61], a new understanding of marginal categories is one of the most important advances in Mediterranean landscape archaeology research in recent years.

With this premise, there is an example of "liminal landscape" that, for several reasons, can be distinguished in a specific area located in the northeastern stretch of territory between Populonia and Volterra. At first, it was demarcated by specific morphological features, such as hills, woods, water (especially in the form of hot and cold sulphur springs), and geothermal phenomena [62] (Figure 9). The liminal aspect of this area appears to have been understood by the ancients who, cognizant of "natural forces", introduced specific sanctuaries and sacred areas; these included the Hellenistic and Roman complex devoted to the cult of Minerva and Silvano in the Sasso Pisano area [63] (Figure 10), and the Roman cult of Bellona in the Monterotondo Marittimo district, which in all likelihood was preceded by a Hellenistic equivalent [23,46]. These cults were significantly linked to woods, water and the wilderness, and were probably also tied to ancient pastoral activities. The archaeological evidence for these practices is very difficult to detect today. Although the lack of archaeological evidence urges us towards a cautious approach, we might be able to re-evaluate the role of this peripheral district and its close relationship with the central place. Starting approximately from the 6th century BC, Populonia began to extend its influence on the Monterotondo area, located on the borders of its territory [64,65]. This expansion might not be a coincidence since, among the various reasons, we can recall Populonia's need for wood resources to support its intensive metallurgical activities [66,67].



Figure 9. An example of the geothermal phenomena in the Sasso Pisano area.



Figure 10. The Sacred thermal complex in the Sasso Pisano area, known as the Il Bagnone archaeological area.

The exploitation of this particular district and its natural resources also continued during the Classical and Hellenistic periods [64,65]. As a result of increased Roman pressure, Populonia might have reinforced its control over this area by building the boundary hilltop fortress of Castiglion Bernardi [26,52,53] (Figure 11).

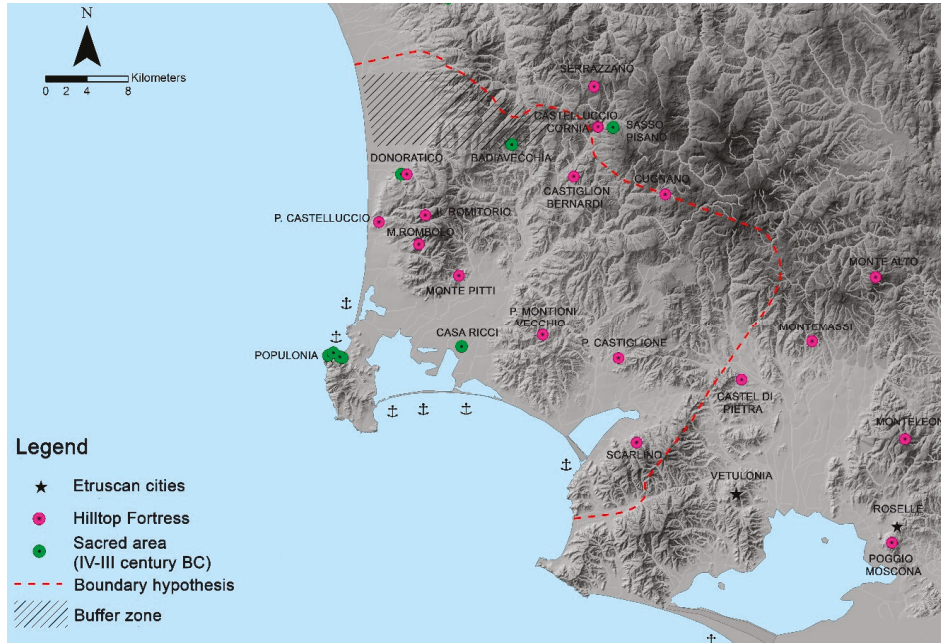


Figure 11. GIS general map of Populonia's sacred areas and hilltop fortresse distribution during the Hellenistic period. The northeastern stretch of territory between Populonia and Volterra.

5. Conclusions

This article aims to outline my new data on the urbanization of Populonia starting from its foundation, with particular reference to the results of archaeological surveys carried out by the University of Siena since the 1980s. The landscape archaeology approach has allowed us to reconstruct the Etruscan city's organization of settlements as well as its management of resources. In addition, this investigative tool has proven the most effective method to detect both places of economic or ideological centrality and specific liminal landscapes in the territory of Populonia. Our research leads us to suggest—in spite of several anomalies in the urban development process and unconventional choices in the control of Populonia's territory—that the Etruscan city's acropolis seems to have played the role of central place starting right from the establishment of the city. A hierarchical settlement system, based on a network of sites and the foundation of new population centers, was promoted starting from the end of the 9th—the beginning of the 8th century BC. Once the city ended its development process and, especially, in the Hellenistic period, policies such as the hierarchical settlement system in the chora and supply basin exploitation were mainly implemented through the foundation of hilltop fortresses both on the mainland and on the Island of Elba. The central place was again concentrated on the Populonia acropolis which, endowed with an upper wall, became the main focus of the fortified settlements and the stronghold of the defence against Roman imperialism. Within some of the new acquisitions coming from my PhD research we have to consider the feature of the hilltop fortresses system and the detection of a “liminal landscape” in the northeastern stretch of the territory between Populonia and Volterra. This particular part of the landscape had been a sacred district with a strong peripheral character and possibly close connections to the central place thanks to the significant availability of natural resources.

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Article

The Cypriot Extra-Urban Sanctuary as a Central Place: the Case of Agia Irini

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Abstract: This article contributes to the ongoing debate on the relationship between sanctuaries and the territoriality of the Iron Age polities of Cyprus. The sanctuary site of Agia Irini, at the locality Alonia, is used as a case-study to test hypotheses regarding the connection between extra-urban sacred space and the formation of political and cultural identities. After a short introduction to the theme, a combination of archaeological (context and iconography) and geographic data is implemented in Geographic Information Systems (GIS) analyses in order to contextualise the centrality of this sanctuary within its political, economic, cultural and symbolic landscapes. The discussion proceeds with the examination of pottery evidence from the sanctuary, both published and unpublished, in order to reveal if and how site based analysis of a category of material may help to further reveal the significance of this sanctuary as a central place, albeit lying in an un-central landscape.

Keywords: Cypriot archaeology; Mediterranean archaeology; landscape archaeology; central places; sacred space; political power; economy; religion; ideology; ancient sanctuaries

1. Introduction

The study of Cypriot sacred landscapes within the *longue durée*, their transformations and their possible change of meanings reinforce current interpretations suggesting that extra-urban sanctuaries played an important role in the political setting of the city-kingdoms, which transformed over time (Figure 1). Excavation of extra-urban shrines of the Archaic and Classical periods (Table 1) has produced evidence that has also been confirmed by systematic excavation activity and which highlights the role of specific Cypriot Iron Age sanctuaries as a focus of wealth disposal and ideological discourse. In addition, as modern scholarship has argued, the distribution of these sanctuaries across the landscape served as a map for a socio-political system, which provided a mechanism for the centralised Archaic and Classical city-kingdom authorities to organise and control their peripheries (for literature review and further analysis see particularly [1] (pp. 90–116), [2–4]).

In this contribution, we take the well-known Cypriot sanctuary site of Agia Irini as a case study to test hypotheses regarding the connection between extra-urban sacred space and the formation of political and cultural identities. After a presentation of the archaeological evidence from the sanctuary we proceed to a combination of archaeological (sites, regional styles and iconography) and geographic data implementing them in Geographic Information Systems (GIS) analyses in order to contextualise the sanctuary within its political, economic, cultural and symbolic landscapes. Then, we focus on pottery analysis in order to reveal if and how site based and in-depth analysis of a specific category of material from the site may further reveal the significance of this sanctuary as a central place or a meeting space where cultural and political identities were constantly negotiated and affirmed. Building upon previous research using *longue durée* approaches, the application of GIS and landscape

archaeology, what we argue is that the model can only be refined when, along with archaeological evidence, one takes into consideration environmental and topographical characteristics and especially the terrain; thus the function and significance of extra-urban sanctuaries can further be clarified [2,4].

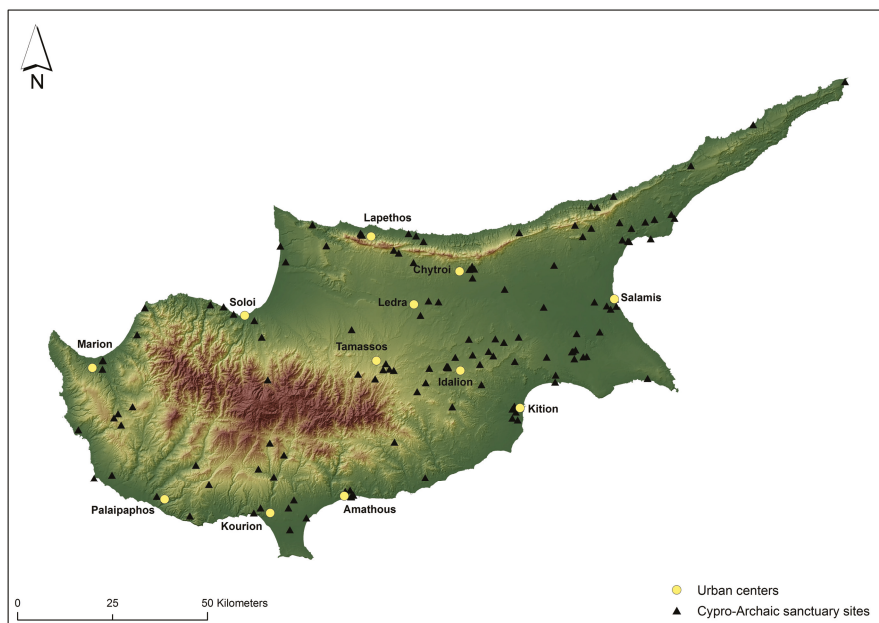


Figure 1. Iron Age urban centres and distribution of definite and possible Cypro-Achaic sanctuary sites; Archaeological data from Unlocking Sacred Landscapes of Cyprus (UnSaLa-CY) database; Digital data courtesy of the Geological Survey Department, Cyprus (by Vasilis Trigas).

Table 1. Chronology of Cultural Periods in Cyprus (after [4] (p. 533, table 1)).

Cultural Period	Period Sub-divisions	Date Range
Late Bronze Age or Late Cypriot	Late Cypriot I	ca. 1700–1450 BC
	Late Cypriot II	ca. 1450–1200 BC
	Late Cypriot IIIA	ca. 1200–1125/1100 BC
Early Iron Age	Late Cypriot IIIB	ca. 1125/1100–1050 BC
	Cypro-Geometric I	ca. 1050–950 BC
	Cypro-Geometric II	ca. 950–900 BC
The Cypriot City-Kingdoms (Iron Age)	Cypro-Geometric III	ca. 900–750 BC
	Cypro-Achaic I	ca. 750–600 BC
	Cypro-Achaic II	ca. 600–480 BC
Hellenistic	Cypro-Classical I	ca. 480–400 BC
	Cypro-Classical II	ca. 400–310 BC
Roman	Hellenistic I	ca. 310–217 BC
	Hellenistic II	ca. 217–31 BC
	Roman	ca. 31 BC–330 AD

2. The Sanctuary Site of Agia Irini: Context, Cult and Iconography

The extra-urban sanctuary of Agia Irini may be associated with the transformed political geography of the Early Iron Age [5,6]; this extra-urban sanctuary has usually been regarded as the ‘classic’ rural Iron Age Cypriot sanctuary but there are well-founded reservations about how ‘rural’ the site was in the minds of the ancient people connected with it [6], [7] (pp. 300–301), [8]. The site constitutes a uniquely preserved (or excavated) example of an Iron Age *temenos*, since the votive objects were found in a primary context, many of them in situ, facing an altar and placed at different heights ([9] (pp. 642–824) (for new readings of the stratigraphy, see [10] (pp. 151–153), [11,12])). The flooding phenomenon at Agia Irini seems to have had an impact on the sanctuary’s layers. The present study has considered the preliminary results presented in recent publications [11–13].

According to Webb’s interpretation, most of the Agia Irini Bronze Age architecture was purely secular: while the identification of the central unit, consisting of a small two-roomed building on the same orientation as the courtyard with a hall to the southeast (Room V) and a small inner room (Room VI) to the northwest has been widely accepted, the nature of the surrounding buildings is far from clear and, as she convincingly argued, these belong to a Late Bronze Age settlement [14] (p. 57). Traditionally, in accordance with the Swedish Cyprus Expedition’s suggested chronology, destruction is recorded within the Late Bronze Age but in the early Cypro-Geometric period the place acquires a clearly religious function.

In the Cypro-Geometric period a *temenos* was constructed, which—according to the excavators and some later scholars following this interpretation—experienced no interruption in cult activity until the late 6th century BC [15], [16] (pp. 67–68), [17] (p. 100) (cf. [11], [12] (pp. 151–156)) (see below). This second phase of the sanctuary has been dated from the Cypro-Geometric I to the Cypro-Geometric III period. Fourrier has recently challenged the unbroken continuity from the Late Cypriot to the Iron Age based on a careful stylistic analysis of the material [18] (pp. 104–106) (cf. [11] (p. 38), [19] (p. 151)). She suggests that the sanctuary was abandoned in the Late Bronze Age and only reoccupied in the Cypro-Geometric III period.

The unbroken sequence at Agia Irini between the Late Bronze and the Early Iron Age is further undermined by the stratigraphic discrepancies of the site that provide no firm confirmation of a continuous use during the aforementioned period, as well as by the comparatively lower archaeological visibility of the hypothesised early Cypro-Geometric phase [13] (pp. 92–96). Pottery evidence in particular seems to confirm that although the site was attended in the Cypro-Geometric I–II period, it is from the Cypro-Geometric III onwards that activity at Agia Irini reached unprecedented levels (see below). If the sanctuary was reinvigorated in the Cypro-Geometric III period as fresh studies seem to suggest, then this development is particularly important. It would place Agia Irini in line with the establishment of other extra-urban sanctuaries with *temene* during this period and the probable memorial patterns related to political and territorial competition by the emerging polities of the Iron Age [6,7]. In other words, the late Cypro-Geometric foundation horizon of a real *temenos* may be related to the consolidation and re-organisation of the city-kingdom polities and their territories and the shift, in which sanctuaries had a major role, from a more private to a more public display of power [7] (pp. 304–307). The appearance of clearly palatial structures, large-scale sculpture, monumental built tombs and regional styles across the whole of the Cypriot landscape, as well as the proliferation of the Cypro-syllabic script, are manifestations of these changes.

The apogee of the sanctuary in votive offerings dates to the late Cypro-Geometric and Cypro-Archaic periods with a short revival in the Hellenistic period [11] (pp. 39–41, 43), [12] (p. 153), [16] (p. 68), that is, to the consolidation of the Cypriot polities. Evidence related to cultic activity, such as bull terracotta statuettes, do occur in Cypro-Geometric I [10] (pp. 157–160, nos. 181–184) but numbers of these votive offerings are significantly less than those of the Cypro-Geometric III and Cypro-Archaic periods. The new role of the sanctuary within this competitive and formative political setting of Early Iron Age Cyprus is clearly manifested also through the scale and iconography of many of its terracotta statues. The large-scale terracotta statues of Agia Irini would have looked imposing in the landscape due to their size and austere

virile appearance and must have served a special purpose, not just as expensive votive offerings but also as awe-inspiring symbols of power and control (Figure 2), a point further explored later in this article. Noticeably, the largest statue wears a turban-like headdress that according to Herodotus (VII: 90) was worn by Cypriot kings (*basileis*) (Figure 3) [10] (p. 184, no. 211), [12] (p. 111).



Figure 2. The Agia Irini showcase at the Medelhavsmuseet, Stockholm, © Medelhavsmuseet.



Figure 3. Terracotta male statue wearing a turban-like headdress, A.I. 2072+2075, © Medelhavsmuseet.

This differentiation between Iron Age Agia Irini and its Bronze predecessor is reflected also in the architectural layout of the sanctuary (for an architectural synthesis of the Agia Irini see [9] (pp. 666–674) and [11] (p. 40, table 2)). In the Cypro-Geometric III period, the Late Cypriot remains were levelled and a typical—yet modest—Iron Age sanctuary in the form of an open-air *temenos* was built. Its main features were a large roughly-built *peribolos* and an altar. These new elements, dated to the 9th century BC, marked the architectural remodelling of the sanctuary in the Iron Age [9] (pp. 671–674), [10] (pp. 152–153), [11] (p. 40). Secondary architectural features also characterise Iron Age Agia Irini but their precise function and dimensions are usually difficult to discern in the publication. Good examples of such elements are the poorly preserved semi-circular stone pavements (substructures 48A and 48B in the original publication) [9] (p. 651) that were viewed as puzzling by Sjöqvist and Gjerstad. These ‘substructures’ were recently interpreted as parts of circular stone pavements or platforms that served cultic purposes during the Geometric and Archaic periods, based on finds—votive figurines and pottery fragments—and on comparanda from other Cypriot and Aegean sites [12] (pp. 109–111). Furthermore, Gjerstad had interpreted a triangular area built of rubble in two or three courses as a low altar (Altar 49) that he associated with Agia Irini Period 2, dated between Cypro-Geometric I and the middle of Cypro-Geometric III period [9] (pp. 651, 671, 817). This rubble-built structure was recently viewed as belonging to a much larger stone pavement of cultic character like the ones mentioned previously, based on the examination of Lindros’ draft stone-by-stone plan, a modified version of which was included in the 1935 publication of the sanctuary [12] (p. 109, figure 1). However, this interpretation remains elusive since it receives no sound confirmation from the archaeological record. A new altar of the Iron Age sanctuary (Altar 50) was erected in Period 3 and remained in use until the end of Period 6. This new structure that replaced the old rubble altar consisted of a monolithic limestone block with a square and well-dressed upper part. It was founded on a sterile levelling layer of rubble, on the rock [9] (pp. 662–663 (section XVII), 671). The construction of Altar 50 was therefore associated with the earliest part of Agia Irini Period 3, dated to the middle of Cypro-Geometric III period on the basis of pottery sherds the majority of which belonged to pottery of Type III [9] (pp. 817–818), [12] (pp. 112–113). Given that altars form indispensable elements of cultic activity, the construction of the first securely-attributed altar at Agia Irini in the Cypro-Geometric III adds further support to the reoccupation of the sanctuary in this period. The Cypro-Geometric III altar was associated with a stone interpreted as a *baetyl*, that is, an aniconic stone cult statue of the deity.

Evidence suggests that the sanctuary functioned for a relatively short period in comparison with other sanctuaries. However, the chronological designation of the abandonment of Agia Irini is still debated. The excavators had dated the end of the final phase of the sanctuary (Period 6) to ca. 510–500 BC, based on the comparisons with pottery finds outside Wall 3 at Idalion and on the absence from Agia Irini of the latest Cypro-Archaic II pottery types [9] (p. 818). Such a chronology, followed also by other scholars [10] (p. 153), would also befit the political upheavals that followed the Persian conquest of Cyprus in 525 BC and the subsequent attempt of certain Cypriot kings towards the end of the 6th century to act against the Achaemenid dominance [8]. Fourrier suggested a slightly earlier date, around the middle of Cypro-Archaic II, based on a somewhat similar argument, the absence from Agia Irini of the Solian terracotta production of the final Cypro-Archaic and beginning of the Cypro-Classical period [18] (pp. 88–90). While the reasons behind the abandonment of the sanctuary are still not fully understood, its relatively short-life offers an advantage for us as archaeologists, as we can better grasp the function of the sanctuary in a specific chronological era.

As manifested above, based on the existing published evidence, the Cypro-Geometric I–III phase of the sanctuary is problematic. The majority of the ex-votos with a date in Cypro-Geometric III period consist of terracotta bulls, which originally were placed around the altar. Other votive offerings probably belonging to this phase consist of animal and ‘minotaur’ statuettes and human figures. Some of the bulls and ‘minotaurs’ dating between the Cypro-Geometric III and Cypro-Archaic I periods have snakes writhing along the neck and back [9] (plates CCXXIV–CCXXVIII), [10] (pp. 157–166). The ‘minotaur’ statuettes have their arms uplifted (Figure 4), a gesture clearly related to the cult of

the 'Cypriot Goddess' [20] (pp. 67–70), [21]. A Cypro-Archaic 'minotaur' figurine reveals even more 'hybrid' features: A cylindrical human torso with male genitalia, female breasts and animal legs [9] (plate CCXXVIII.4), [10] (pp. 164–166 no. 190), probably alluding to a dual-sexed image [6] (p. 80). A two-headed Cypro-Archaic terracotta figure wearing a helmet from Agia Irini might also be a personification of such a dual, ambivalent identity [9] (plate CCXXXIII.9).



Figure 4. Terracotta 'minotaur' with uplifted arms, A.I. 1775, © Medelhavsmuseet.

Similar questions about the Early Iron Age evidence from Agia Irini arise also when looking at the published pottery from the site. Leaving aside Agia Irini Period 1 that corresponds to the Late Bronze Age use of the site, Periods 2 to 6 were thought to mark the continuous use of the sanctuary from ca. 1050 to 500 BC [11] (pp. 41–42). Periods 2 and 3 were ascribed a Cypro-Geometric chronology, whereas Periods 4, 5 and 6 fall entirely in the Cypro-Archaic period. As discussed above, the idea of the uninterrupted use of Agia Irini from the Late Bronze to the Early Iron Age has been scrutinised on more than one occasion [13] (pp. 92–95), [18] (p. 89), especially with regard to the chronology of Period 2 (ca. 1050–800 BC) upon which the theory of a Cypro-Geometric I use of Agia Irini was based. A closer look at the published pottery associated with Period 2 demonstrates that the only complete vase and 33.5% (80 out of 238) of pottery sherds from this period actually belong to Cypro-Geometric III types, with 158 sherds dated to Cypro-Geometric I–II periods [9] (pp. 812, 817). The presence of

Cypro-Geometric I–II sherds was confirmed also during the study of the unpublished pottery from the site at the Medelhavsmuseet in Stockholm, as part of a postdoctoral research project. However, their numbers were relatively low and they were always found intermixed with later material, since no exclusively Cypro-Geometric I–II layer could be verified. This fact, viewed alongside the extensive architectural remodelling of the site in the Cypro-Geometric III period, seems to support that official cultic activity at Agia Irini was re-established in the course of Cypro-Geometric III period. Agia Irini Period 3 (ca. 800–700 BC), to which the first securely identified altar belongs, comprised two vessels, one dated to Cypro-Geometric III and the other to Cypro-Archaic I, whereas 58.5% of the pottery sherds associated with Period 3 (167 out of 287 sherds) belonged to type III (Cypro-Geometric III), followed by 16.7% (48 out of 287 sherds) that belonged to Type IV (Cypro-Archaic I). The comparative look at pottery from these two periods (Period 2 and 3) that mark the Cypro-Geometric use of the sanctuary, clearly point to the dominant position of Cypro-Geometric III pottery types and seem to further support the idea of the sanctuary's firm re-establishment in the Cypro-Geometric III rather than Cypro-Geometric I period. Evidence dated prior to Cypro-Geometric III period does exist but it may actually correspond to more occasional or less frequent cultic visits to the sanctuary.

In Period 4 (ca. 700–600 BC) that roughly coincides with Cypro-Archaic I, the sanctuary was enlarged by widening the *peribolos* wall around the *temenos*. Cult continued uninterrupted from Period 3 although votive offerings reached their peak during the Cypro-Archaic I period. Nonetheless, certain aspects of the cultic practices may be deduced with a fair amount of confidence based on the iconography of the votive offerings. For example, we may assume that bulls' masks were worn during the ceremonies as part of ritual dress. Among other finds, two separate (i.e., not part of a group composition like the case of Kourion discussed below) figures putting on a bull-mask are preserved (**Figure 5**); similar gestures in figurines have been found both in the sanctuary of Apollo Hylates at Kourion, in the necropolis of Amathous, the extra-urban sanctuary of Athienou-Malloura and so forth. ([9] (plate CCXXXIII.8), [10] (pp. 162–163, no. 187), [22]; for a full catalogue of masked figures see [23] (pp. 27–39)). Other aspects of the Iron Age ritual can also be postulated based on the archaeological data from the sanctuary. It almost certainly involved food and drink consumption in the form of sacred banquets, as is evidenced through the pottery shapes and the amounts of animal bones, mostly sheep and goat, retrieved during excavation. In addition, ritual circular dances were taking place at Agia Irini, a fact further confirmed by the presence of votive figurines that portray flute and tambourine players or ring dancers (**Figure 6**) [10] (pp. 151, 198–199, no. 228), [11] (pp. 37, 43). Apparently, Late Cypriot religious practices seen, for example, at Kition and Enkomi survived into the mature Early Iron Age and continued into the Cypro-Archaic period.

Most of the Cypro-Archaic ex-votos at Agia Irini consist of terracotta human sculptures of various sizes, from small to life-size statues, figures of warriors and chariots [10] (pp. 168–198), [24,25]. In spite of the amount of votive offerings, details of the cult at Agia Irini remain unknown due to the absence of textual evidence, although the deity worshipped probably had functions and roles that exceed those merely concerning fertility (cf. [10] (p. 152)). The assumption that the sanctuary at Agia Irini was dedicated to a male fertility god of agrarian nature might well be correct. While the presence of male iconography is a standard method of identifying the nature of the deity in Mediterranean sanctuaries, the sex of votives is not necessarily always connected with the sex of the deity [26]. However, comparative evidence from other Iron Age Cypriot sanctuaries sheds more light on this question [4] (p. 555).



Figure 5. Terracotta statuette of a human wearing a bull mask, A.I. 809, © Medelhavsmuseet.



Figure 6. Terracotta group of ring dancers, A.I. 1693+2083 © Medelhavsmuseet.

In accordance with other Iron Age extra-urban sanctuaries of the island (such as Athienou-Malloura, Golgoi-Agios Photios, Lefkoniko, etc.), we should probably add more roles to the deity venerated at the site, related to the territorial formation of the Iron Age Cypriot polities. Instructive for the application of a methodology, which aims to recognise counterpart religious ideologies in the material culture of the Iron Age extra-urban Cypriot sanctuaries, is the study of Counts on the iconography of the 'Master of the Animals' encountered in many sanctuaries in the Mesaoria plain [27] (with references). In addition, the display of large-scale votive statues in some of these sanctuaries should be seen within the ideological competition of the various city-kingdoms in 'frontier zones' to mark (at least symbolically) their power over their territories.

The well-documented votives of the Agia Irini sanctuary might be associated with a similar ideological construction present also on the north-western part of the island. The sanctuary provides a nexus of ideas, admittedly ‘dark,’ complex and impenetrable to *our* eyes, that might link Late Cypriot and later city-kingdom religious traditions better than any other excavated site [1] (p. 267), [6]. A preliminary study of the iconographic elements from the sanctuary seems to identify a male Cypriot divinity with religious ideas related to the Cypriot so-called ‘Master of the Animals.’ Nonetheless, we are not yet in a position to argue that in Agia Irini we have the same male deity (deities) as that found in Mesaoria. The various representations of male gods in Cyprus may be viewed as visual manifestations of a ‘Great God’ who acted as consort to the island’s ‘Great Goddess’ [27] (p. 140), [28] (pp. 26–28, 216–218). Based on the lack of contemporary textual evidence and the convoluted Cypro-Archaic divine iconography, we are far from understanding whether we should speak of one ‘Great God’ or of more male deities with similar functions on the island during the Cypro-Archaic period. Counts, opposing the idea that the various types correspond to different local or foreign divinities, suggests that the various male deities should be associated with the conception of a single, principal male divinity associated with particular sanctuaries in the Mesaoria region [27] (with references). Even though the unification of many qualities in a single male deity worshiped throughout the island remains inconclusive, the presence of royal ideology in such extra-urban sanctuaries in association with one male deity (or more) has been implied in the archaeological literature. Yet, this subject needs further refinement [1] (p. 267), [27].

Both infantry and warriors in chariots in various sizes are represented in the Iron Age strata at Agia Irini. Such iconographic evidence is clearly related to the reception (and imitation) of elements of royal ideology by upper societal strata and probably by other non-elite groups in order to express a prevalent cosmological system. In addition, the presence of specific iconography (such as sphinxes, bull iconography or Egyptianising material), point to the manifestation of Cypriot city-kingdom royal power and ideology in the context of the sanctuary [6] (pp. 81–84), thus contributing to its character as a central place. This was a place of display of elite ideology and negotiation of social identities. The presence of large-scale terracotta sculpture and of specific iconographic types in the sanctuary seems to have stressed a symbolic claim of domination over the territory.

3. Applying GIS and Landscape Archaeology

As we argue in this contribution, the combination of archaeological indicators and GIS analyses reinforce the argument that the Agia Irini sanctuary possessed an important hierarchical position in the political and economic life of the area. To better secure this observation, we examine the topographical setting of the sanctuary in a broader landscape perspective, considering its relation to the nearest settled environment and natural resources.

As we further discuss below, scholarship has viewed the sanctuary in a ‘frontier zone’ critical for the territorial formation of Lapithos and Soloi. Fourrier has attempted to organise Cypro-Archaic terracottas from various sanctuaries in a system based on artistic style, drawing specific patterns of diffusion within each region, the centre of which is assumed to have functioned as a capital of royal authority [18] (p. 113, figure 9). She regards a regional style as a shared element of a community that can be defined through a consideration of morphological characteristics, manufacturing techniques and sources of influence. Fourrier proceeds to a discussion of the diffusion of the various styles in the sanctuaries attempting, where possible, a distribution based on the distance from the production centre: sanctuaries very close to the centre (*le cercle proche*), territorial sanctuaries (*les sanctuaires de territoire*) and frontier sanctuaries (*les sanctuaires de frontière*) [18]. She allocates many extra-urban sanctuaries in the territories of specific city-kingdoms, or in frontier zones between two city-kingdoms. In the Cypro-Archaic period, these sanctuaries should have belonged to secondary centres, villages and/or farmsteads within the sphere of influence of specific city-kingdoms. She, therefore, identifies liminal zones between the various city-kingdoms. According to Fourrier in most frontier sanctuaries we find material—mainly terracotta figurines and terracotta sculptures—belonging to more than one regional

style. While several scholars have placed the sanctuary of Agia Irini within the territory of Lapithos (for bibliography see [17] (p. 100) and [20] (p. 378)), Fourrier, using stylistic criteria that in her opinion reflect politico-economic settings, assigns the sanctuary to the territory of Soloi [18] (pp. 89–92).

It is true that the sanctuary of Agia Irini also produced terracotta statues and statuettes that have been associated with the production of Cypriot polities other than of Soloi. Most important among them are the imports from Kition. Fourrier identified two groups of terracottas at Agia Irini that were either of Kitian origin or produced under strong Kitian influence [18] (p. 91). Almost of equal importance to the Kitian evidence are the imports from Idalion (or terracottas of Idalian style) which are not exclusive to Agia Irini but are also attested at other sanctuaries within the realm of Soloi such as at Meniko and Lefka [18] (p. 91). Far less common is the occurrence at Agia Irini of the products from Amathous, Salamis and Paphos [18] (pp. 91–92). In addition, Orsingher based on the evidence from funerary contexts at Agia Irini-Paleokastro, argued for a connection with Salamis, Amathous and primarily with Kition, a link further supported by Phoenician inscriptions, the iconography of a funerary stela and the aforementioned representation of Kitian terracottas at the sanctuary [29]. Despite the extreme dearth of Phoenician-type pottery from the sanctuary [13] (p. 100)—as opposed to the nearby necropoleis—cult at the sanctuary of Agia Irini has been repeatedly viewed through Phoenician spectacles [12,30], a fact that has been questioned in other occasions [6] (pp. 83–84, 97–99).

The cultural unity of the city-kingdoms of Cyprus includes regional variability created by inter-regional influences and stylistic comparisons. We view stylistic influence *vis-à-vis* with other aspects of material culture, epigraphic sources and topographical features, to further clarify the picture [4,31]. In addition, modern research on pottery further argues in favour of a more centralised production for each polity [32–36]. Taking altogether the evidence from Agia Irini we wish to re-think whether the sanctuary should be considered a ‘frontier’ or simply a ‘territorial’ sanctuary.

The digital data used for the GIS analyses derive from the Eratosthenes database, maintained by the Department of Geological Survey, the Department of Land and Surveys and the Department of Agriculture (soil and water use section) of the Republic of Cyprus. The data used for the analyses were the digital elevation model (DEM) of Cyprus, the geological map, ancient copper slags, rivers, village centres and the Cypriot landscape soil map. Agricultural soils are those suitable for cultivation. Nevertheless, agricultural areas with some sort of cultivation nowadays, thus possibly also in the past, are included. In addition to Iron Age urban centres, our maps also include all the known sanctuary sites in the broader region (Table 2), digitised and maintained in the Unlocking Sacred Landscapes of Cyprus (UnSaLa-CY) database. For the purposes of this article we attempted three sets of GIS analyses, all run in commercial ArcGIS: Visibility Analysis (VSA), Cost Surface Analysis (CSA) and Least Cost Paths (LCP). However, we recognise that the use of these analyses in archaeology is complementary. We consider them only as supportive evidence for the boundaries suggested by archaeological evidence, rather than as analyses that in their own right indicate the existence of boundaries or liminal zones. What we suggest here is that we should abandon linear and simplistic approaches to the territorial formation of the Cypriot polities, adopting a more flexible and holistic approach that values the realities of the landscape and its resources and considers the totality of the available evidence. In this way, we hope to overcome the deterministic nature of GIS, while simultaneously avoiding explanations derived only from stylistic analyses and uncritical applications of computational models (for further explanation and analysis on the data and also methodological issues and problems behind these GIS analyses see [4]).

Table 2. Known Cypro-Archaic (CA), Cypro-Classical (CC), Hellenistic (H) and Roman (R) sanctuary sites included in the following GIS analyses and maps; Data derive from the Unlocking Sacred Landscapes of Cyprus (UnSaLa-CY) database.

Map Number	Site Name	Chronology
1	Agirda-Abdi Kougousou	CA, CC
2	Agirda-Bostanlik (Yassi Belenk)	CA, CC, H
3	Dikomo-Merra Oneisia	CA, CC, H
4	Galini/Potamos tou Kampou-Laxia tis Shistis	CA, CC
5	Gialia-Photies	CA, CC, H
6	Agia Irini-Alonia	CA, H
7	Agia Irini-Palaeokastro	CA, CC, H
8	Agia Varvara-Poupraes or Pera Chorio/Kotsiatis-Koukourtis	CA, CC
9	Kakopetria-Agilades	CA, CC
10	Kalo Chorio-Zithkionas	CA
11	Kazafani-Mines	CA, CC
12	Keryneia-Chrysochorafon	CA, CC, H
13	Keryneia-Regatikon	CA, CC, H, R
14	Lapethos-Kremmos tou Volou	CA
15	Lapithos-Drakontas	CA, CC, H
16	Lapithos-Prostemenos	CA, CC, H
17	Limnitis-Mersineri	CA, CC, H
18	Meniko-Litharkes	CA, CC
19	Mersinaki	CA, CC, H
20	Myrtou-Pigadhes	CA, CC, H
21	Nicosia-Hagios Georgios 1	CA, CC, H
22	Nicosia-Hagios Georgios 2	CA, CC, H
23	Orga-Kapsalia	CA, CC
24	Pera-Frangissa	CA, CC, H
25	Philani-Petaloudes	CA
26	Politiko-Chomazoudia	CA, CC, H, R
27	Politiko-Hagios Mnason	CA, CC
28	Politiko-Mialathi/Pediaios	CA, CC, H, R
29	Pomos-Appirouri	CA, CC
30	Skouriotissa/Katydata-Linou	CA, CC
31	Soloi-Acropolis	CA, CC, H, R
32	Strovolos-Kokkines	CA, CC

The economic model that shaped the political geography of Iron Age Cyprus depended on the control of a unified territory that had access to copper sources, agricultural land and a coastal gateway [5], [6] (p. 75, with references). Our environmental maps clearly show that Agia Irini has no direct connection with the Cypriot pillow lavas and basal formations where copper was extracted from and that would have probably been an important topographic factor in the placing of Cypriot Iron Age sanctuaries [4]. What our mapping shows however is that Agia Irini dominated the northern limit of the rich agricultural plain of Morphou (Figure 7). Northeast of the sanctuary are the hilly westernmost offshoots of the Pentadactylos range.

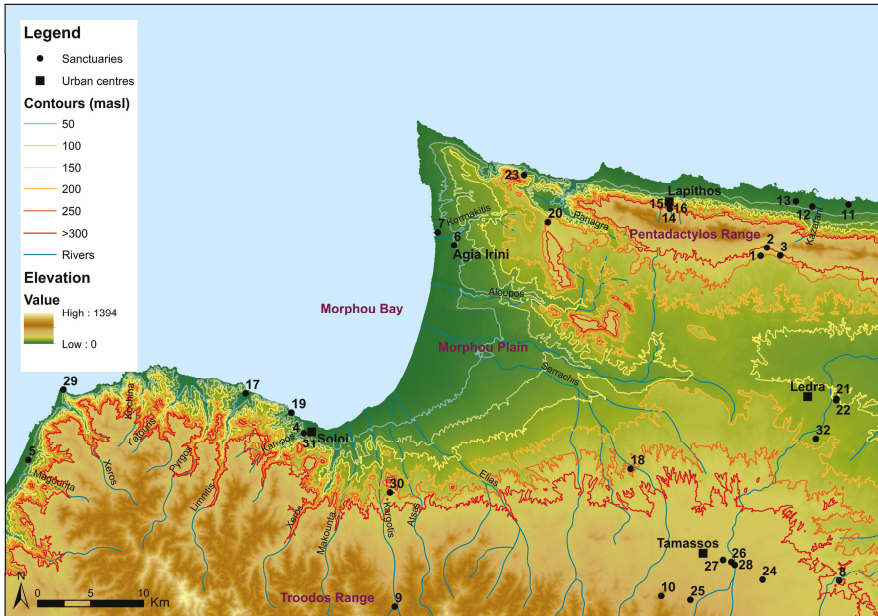


Figure 7. Environmental map; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

The VSA from Agia Irini confirms that the sanctuary has no visibility towards Lapithos (**Figure 8**). The northeast view is totally restricted by the presence of the Pentadactylos Mountains Range. Thus, it becomes clear that one should definitely consider the terrain when attempting to discuss whether the sanctuary belonged to the territory of Lapithos or Soloi. Agia Irini, however, has strong visibility towards the sea and, primarily, towards Soloi and its surrounding area including other sanctuaries in the region of Soloi, the agricultural land and the copper resources south of Soloi, where evidence of ancient copper slag heaps and workings have been identified [37]. The visibility from Agia Irini across the Solian territory may correspond to the economic, political, or religious connections of the sanctuary. Thus, the visibility from the site, added to the archaeological evidence described above, supports placing the sanctuary primarily within Soloi’s sphere of interest. The VSA from Soloi also confirms the visual relation of this polity rather than of Lapithos with the sanctuary (**Figure 9**). While Lapithos has total visibility towards the north coast of Cyprus but no visibility at all with Agia Irini, Soloi has visibility with the sanctuary and total visual control of the Morphou Bay and a very large part of the Morphou plain.

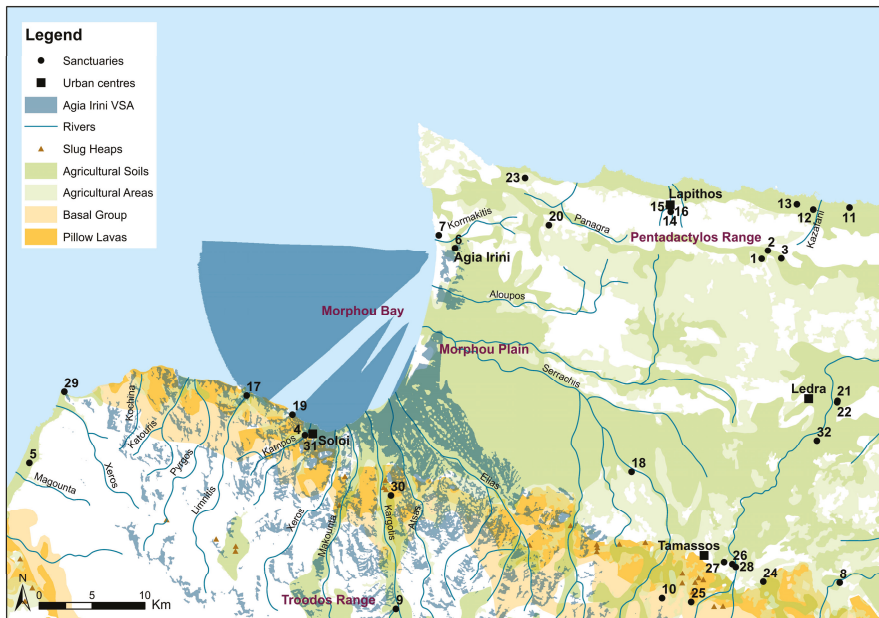


Figure 8. Visibility Analysis from Agia Iri; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

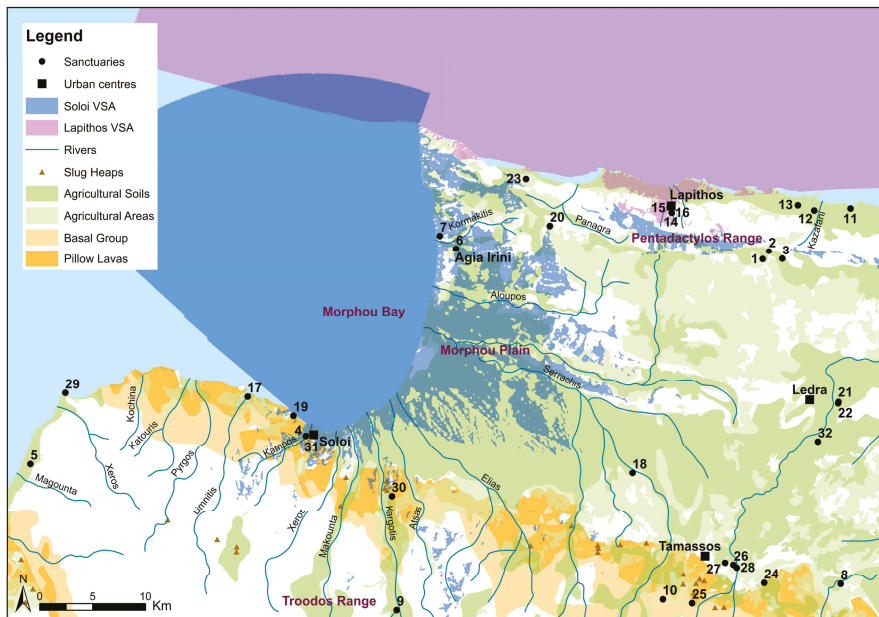


Figure 9. Visibility Analysis from Soloi and Lapithos; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

It is interesting to discuss here the visibility between Agia Irini and the other securely identified Cypro-Archaic sanctuaries in the broader region, namely with the coastal sanctuary at Soloi-Acropolis and those at Galini/Potamos tou Kampou-Laxia tis Shistis, Merinaki, Limnitis-Mersineri and possibly with the inland Skouriotissa/Katydata-Linou sanctuary near the copper deposits (**Figure 7: nos 31, 4, 19, 17 and 30**). The location of the latter, amongst other functions, may have also served to secure Solian territorial claims and access to the copper-bearing north foothills of the Troodos Mountain Range (**Figure 10**) (cf. [4,38–40]). In addition, if we accept the possibility that a Cypro-Classical sanctuary in the area of Kakopetria-Agilades (**Figure 7: no. 9**) belonged to the southern end of the Solian territory, its placement front of the copper resources may have ideologically protected this kingdom's access to the precious metal. Let us simply consider the strong military iconography, along with the presence of an Athena-like goddess and weapons among the offerings found in a votive pit in this area [41]. Although it is risky to apply deterministic values to the location of sanctuaries, the available evidence may suggest that Agia Irini was related in some way (as a nodal point) to a network of sites that were associated with visual control of the agricultural production but also with the visual control (inland and coastal) of a metal-producing economy. Moreover, the proximity to rivers or stream beds and the location on hills or knolls with a view over agricultural land, both of which characterise the topography of Agia Irini, are features shared by many Cypriot extra-urban sanctuaries of the Archaic and Classical periods and they seem to stress the importance of control and exploitation of agricultural lands [42] (pp. 275–276). At this point we should clarify our point: we do not refer to a direct involvement of the sanctuary in these economic activities; rather, we refer to a mental process of creating an ideational space embodying power, ideology and control [4].

We preferred CSA over other GIS catchment approaches, since traditional catchments and tessellations rely on the assumption that the landscape is flat. As we emphasised above, in the real landscape, the size and shape of a catchment area or territory vary depending on the nature of the terrain, which is taken into account in CSA. When we run the CSA from Lapithos and Soloi (**Figure 10**), it becomes clear that the sanctuary at Agia Irini lies in an almost equal walking distance of about 5–6 h from each polity. When we compare the analysis run from Agia Irini itself (**Figure 11**), once again, it becomes obvious that one would need about 5–6 h to reach Soloi or Lapithos on foot. This 'equal distance' between Agia Irini and the two polities to which the sanctuary has been linked, as well as the landscape terrain itself and access to the site, question the very idea of Agia Irini's greater proximity to Lapithos and seems to suggest its most likely relation to Soloi rather than to Lapithos. In addition, it becomes obvious that the sanctuary is marking the limits between two different habitats: the fertile alluvial plain of Morphou to the south and the off-shoots of the Kerynia/Pentadaktylos range projecting into Cape Kormakitis to the north. If and when this limit between different landscapes also became the frontier between two different polities is a broader historical question that is closely related to our inconclusive knowledge of early Lapithos. It seems, however, reasonable at least to suggest that due to its geographic position, Agia Irini became involved in this process of setting or signalling frontier zones. Would this, however, be an extra reason, in addition to iconography, to consider Agia Irini as a frontier sanctuary?

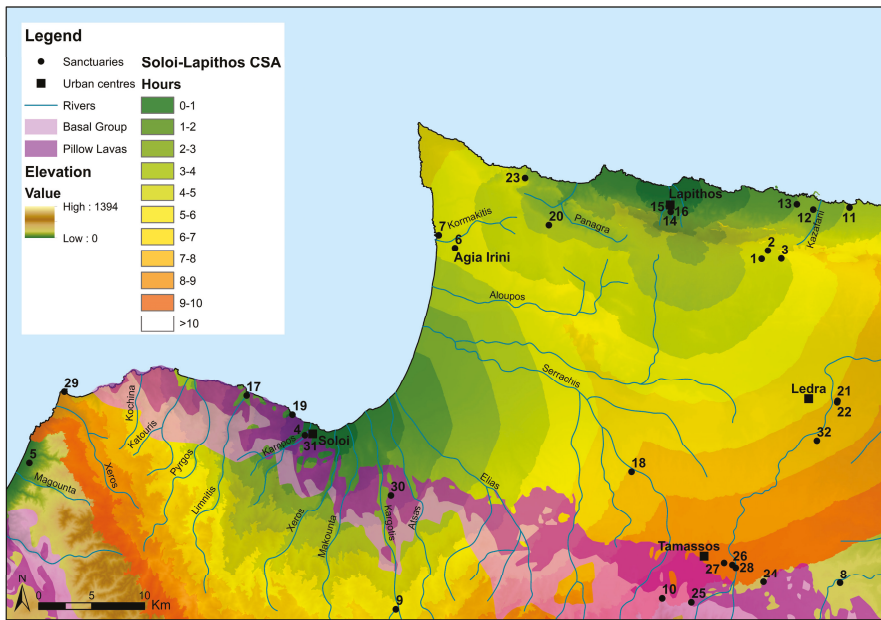


Figure 10. Cost Surface Analysis from Soloi and Lapithos; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

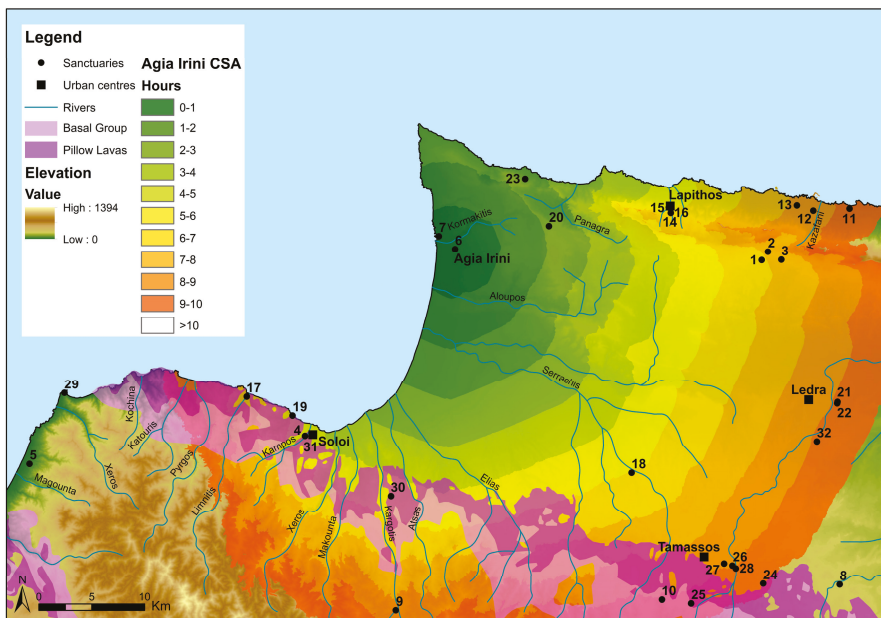


Figure 11. Cost Surface Analysis from Agia Irimi; Digital data courtesy of the Geological Survey Department, Cyprus (by Dr Charalambos Paraskeva).

The LCP analysis (Figures 12 and 13), combined with the archaeological evidence, does not allow us to further discuss the strategic placement of the Agia Irini sanctuary. Nevertheless, LCP analysis may help us better visualise the strategic placement of the Myrtou-Pigadhes (Figure 7: no. 20) sanctuary, northeast of Agia Irini. Myrtou-Pigadhes is strategically placed near the Panagra passage, on the route from Soloi to Lapithos. In fact, the Panagra passage is one of the very few entrances from Lapithos to the south via the Pentadaktylos Mountain Range. While Ulbrich, based on distance, places Myrthou-Pigadhes in the territory of Lapithos [20] (pp. 375–376), Fourrier, based on style, places this sanctuary in the territory of Soloi [18] (pp. 92, 113, figure 9). The Solian association of Myrtou-Pigadhes remains a valid hypothesis that is, however, difficult to prove. What may be argued with greater confidence is that both Myrtou-Pigadhes and Agia Irini seem to be placed in an area that can be described as liminal or frontier largely due to its geomorphological features: Agia Irini at the northern edge of the fertile Morphou plain and Myrtou-Pigadhes at the entrance of the Panagra passage that gives access the north coast of Cyprus.

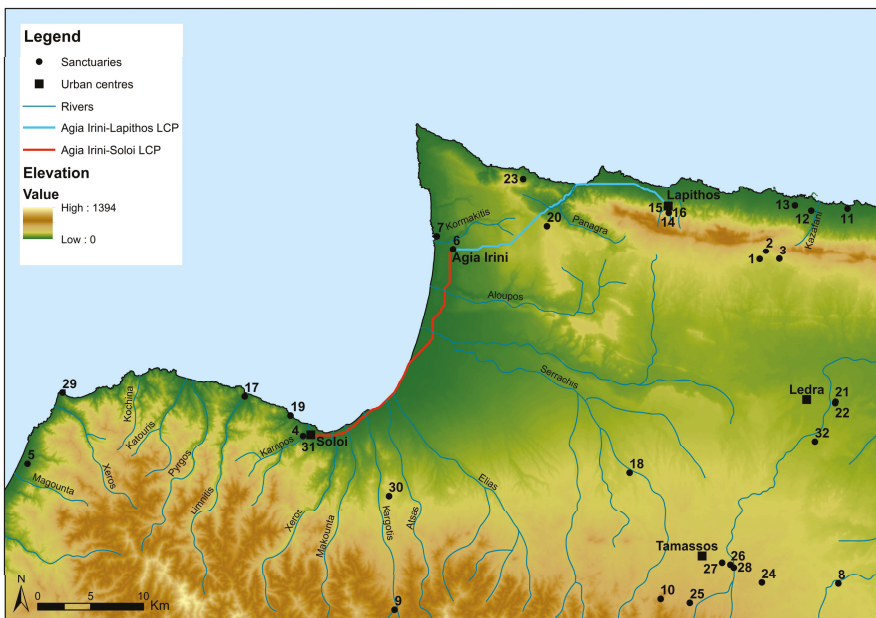


Figure 12. Least Cost Paths Analysis from Agia Irini to Soloi and Lapithos; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

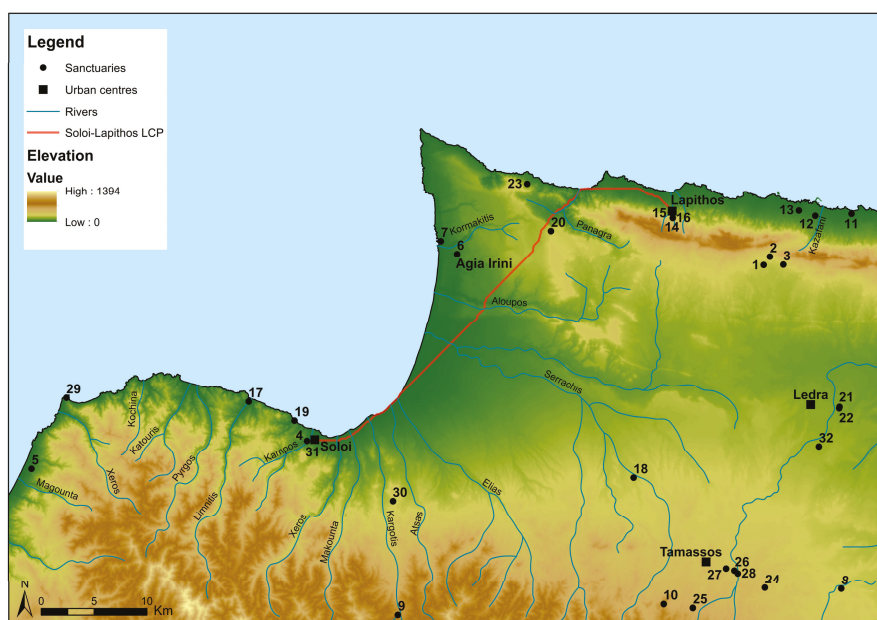


Figure 13. Least Cost Paths Analysis from Soloi to Lapithos; Digital data courtesy of the Geological Survey Department, Cyprus (by Charalambos Paraskeva).

The landscape analysis above suggests that Agia Irini, associated with Soloi both by archaeological material and by GIS analyses, is located in a strategic position between Soloi and Lapithos. The GIS analyses seem to show that natural landscape features enabled, if they did not determine, the territorialisation of the polities. In this respect, GIS analyses are similar to regional styles, which may suggest but cannot prove a territorial connection. Regardless of labelling the sanctuary at Agia Irini ‘frontier’ or not, its location (perhaps in association with the sanctuary of Myrthou-Pigadhes) and the ideological investment at the site, as read by the archaeological material analysed above, appear to contribute to making this ‘un-central’ landscape or territory ‘central,’ establishing a Solian buffer against the interests of Lapithos in the agricultural land of Morphou Bay and the copper-bearing foothills of the Troodos Mountains Range. As has been argued elsewhere [4], specific extra-urban sanctuaries were possibly placed in frontier/liminal zones, rather than in absolute frontier lines. Whether in extra-urban settlements, along long-distance communication routes, or in frontier zones, extra-urban sanctuaries—both on the frontier and in the periphery—were linked to the evolving socio-political and socio-economic fortunes and the very formation of the territoriality of each kingdom. Sanctuaries like Agia Irini, located in frontier or liminal zones, may have served as both contact and confrontation points between polities and between settlements lying within these zones. One should remember that these places were also functional elements in the organisation of settlements and communication systems rather than merely points of (symbolic) demarcation and definition. They could act as intermediary spaces between polities and settlements and as spaces of interaction between inter- and intra-regional communities. A closer view at the pottery evidence from Agia Irini may help in understanding if and how centrality is manifested in the material evidence.

4. Pottery Analysis and the Centrality of a Sacred Place

Pottery finds from Agia Irini form an important body of evidence, only partially discussed in the 1935 publication of the site. However, the comprehensive study of pottery from the site may

contribute decisively to the examination of the sanctuary not just as a site where cult was performed but also as a meeting place with political and ideological connotations, a site where different social identities were negotiated and special symbolic messages were conveyed. The latter is closely related to the possible centrality of Agia Irini. At this stage we only note that the investigation of centrality has to consider a number of factors and to verify if these are attested in the archaeological record. These elements include questions about topography, proximity to natural resources, engagement in networks of interaction between different people and/or differently organised areas, presence of cultic or economic functions, large-scale storage, consumption of food and drink, the presence of monumentality, the display and disposal of votive offerings and so forth. [1] (pp. 94–95), [43].

The use of pottery can be particularly helpful when examining certain of the aforementioned parameters, especially those related to economic functions, consumption and to interaction between different communities. Such an examination closely relates to questions about style and production, as well as to distribution and circulation patterns of certain products within the island.

Recent studies on Cypro-Geometric ceramics tend to complement the results of Fourrier's analysis of Cypriot terracotta production [18], [36] (p. 107), [44] (pp. 95–96, 105). In other words, both pottery and terracotta products seem to display similar fabrication and distribution patterns within the island, a fact that must mirror the formation of distinct political identities of the various Cypriot polities during the Early Iron Age. As previously stated, the vast majority of terracottas from the sanctuary at Agia Irini were associated primarily with the production of Soloi. Other parts of the island, such as Kition, Amathous, Salamis, Paphos, Lapithos and Marion, were also represented albeit in much smaller numbers.

The vast representation of regional styles in Cypriot terracotta production at Agia Irini may be evocative of a cultic place with an established importance and reputation beyond the limits of the 'local' area. The coexistence of terracotta statues and statuettes that belonged to different regional styles and represented different production centres and sources of influence is in essence a manifestation of a cultural, stylistic and ultimately of identity interaction, for which Agia Irini provided an ideal ground. This co-existence must have been facilitated also by the sanctuary's position at the northern limit of the fertile Morphou plain with relatively easy access from other parts of the island and in proximity to the coastline of the Morphou bay [18] (p. 91).

When trying to scrutinise Fourrier's stylistic and political associations between Agia Irini and Soloi based on pottery finds, two things should be kept in mind: first, the attendance of major cultic places is usually intra-regional and therefore the stylistic assessment of pottery finds can be of use only to a certain extent; and secondly, the ceramic investigation of possible ties between Agia Irini and Soloi is hampered by our incomplete knowledge of the ceramic production of the latter during the Cypro-Geometric and early Cypro-Archaic periods. Although numerous Cypriot centres of pottery production (namely Salamis, Paphos, Amathous, Kition, Kourion, Lapithos and Kythrea) have been identified through the comparative study of fabric, surface treatment, shapes, style and decoration [36], [44] (with references), our knowledge of the Solian pottery production at the time of consolidation of the Cypriot polities remains elusive [34] (p. 381).

This gap is partly counterbalanced by the results of chemical analyses of 66 terracotta statues, statuettes and clay vessels from Agia Irini, dated between the Late Bronze Age and the Cypro-Archaic period [45]. The vast majority of the objects analysed (59 out of 66 or 89.4%) were similar in chemical composition. The coherent nature of their chemical and petrographic properties indicated that the clay beds used for their manufacture were probably located in the same area. Although dearth of comparative material hampers any secure conclusions about the precise location of these clay-beds and hence about the origin of the objects analysed, a few further points can be made: first, there is a consistency between the chemical composition of the terracotta material and that of the pottery sherds examined [45] (p. 309). This seems to further strengthen the idea that Cypriot terracottas and pottery followed similar patterns of production and distribution. Secondly, a considerable number of the terracotta fragments that were analysed belonged to Fourrier's Soloi

production-group [45] (pp. 302–303, table 1). The chemical homogeneity of this material may therefore hint a Solian production also for most pottery fragments that largely fell within the same chemical groups as the terracotta statues and statuettes. If this is the case, then there is an additional element to support the association between the sanctuary at Agia Irini and the realm of Soloi.

A first look at the (unpublished) pottery fragments from the sanctuary also indicates that many different parts of the island are represented in the ceramic record. Comparisons with the pottery from Lapithos, mostly burials, shows that certain ceramic types were popular both at the sanctuary of Agia Irini and at Lapithos. These include the White Painted II footed bowls with a single reserved band in the handle zone (Figure 14) (cf. [46] (plate VIII.1, [47] (plate III, no. 5), [48] (plate XLII, nos 31–32)). One should also notice the similarities between White Painted I products from funerary contexts of Lapithos and the area of Agia Irini and those found in a poor cluster of tombs at Karanghas, about three miles from the coastal necropolis of Agia Irini [49] (p. 194). A similar ceramic predilection shared by the sanctuary at Agia Irini and Cypro-Geometric burials at Lapithos is that for closed vessels of Black Slip I–II ware, either in the form of trefoil-lipped jugs or in the form of amphoriskoi (Figure 15) [48] (plate XLIII.35–42). The very fragmentary state of the unpublished material from Agia Irini (mostly body sherds) does not allow a secure identification of the shape although all Black Slip sherds from the sanctuary belong to closed vessels. The Black Slip technique was popular also at Amathous and Kourion during Cypro-Geometric I and II periods, with most vases belonging to the type of amphoriskoi with vertical handles [34] (p. 377, figures 11 and 12).

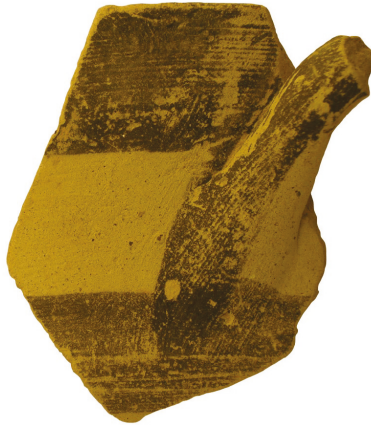


Figure 14. White Painted I bowl fragment from the sanctuary at Agia Irini, AIS 0780.003, H. 5.1 cm, © Medelhavsmuseet.



Figure 15. Black Slip I-II jug fragment from the sanctuary at Agia Irini, AIS 0804.034, H. 6.4 cm, © Medelhavsmuseet.

Affinities between the pottery of Agia Irini and that of Lapithos can be spotted also in decoration. Although figurative decoration is extremely rare among the unpublished Iron Age pottery from the sanctuary, the Iron Age material included a White Painted I stemmed goblet (for the type see [13] (p. 99), [15] (figure III.3)) decorated with a male goat standing on its hind legs and eating from a tree (Figure 16). The style of the tree on the unpublished example from the sanctuary, with the characteristic linear depiction of the branches, is almost identical to ‘palm trees’ on White Painted I vessels from burials at Lapithos [46] (plate VIII.8), [47] (plate III.29), [50] (p. 494, plate XXVII.1) suggesting that the vessels were perhaps produced at the same workshop.

The influence of the pottery from Kition is perhaps indicated through the unpublished fragments of some plates decorated in the White Painted and Bichrome technique, latter occasionally combined with Black Slip (Figure 17). This trend has been associated with the ceramic production of Kition in the Cypro-Geometric I/II period [33] (pp. 330–301), [34] (p. 378).



Figure 16. White Painted I stemmed goblet from the sanctuary at Agia Irini, AIS 0400.002, H. 14.5 cm, © Medelhavsmuseet.



Figure 17. Black Slip Bichrome II plate, AIS 0588.008, W. 4.6 cm, © Medelhavsmuseet.

Phoenician trends, most probably originating from Kition, appear far less common at the sanctuary than at the burials excavated in the early 1970s by the Italian Mission at Agia Irini-Paleokastro [29]. Certain pottery types recorded in the publication of the sanctuary, such as Red Slip II (IV) and III (V) ridge-necked juglets [9] (plate CLXXXVII, bottom row, second, third and fourth from the left) belong to a Phoenicianising typology but their popularity among the unpublished fragmentary ceramics was low.

Evidence for contacts with other parts of Cyprus is also reflected in the pottery from the sanctuary at Agia Irini. The pottery production of Paphos is well represented at the sanctuary, as is manifested by the presence of Black-on-Red I (III) and II (IV) products, a ceramic technique that characterises the production of Paphos. Towards Paphos, at least as a source of influence, also points the extensive use of concentric circles on the unpublished ceramic material of Agia Irini (Figure 18) [9] (pp. 776, 812; cf. figures CLXXXVII, CLXXXVIII for vases, mostly jugs and juglets, decorated with concentric circles). This motif was particularly popular in the area of Paphos from the Cypro-Geometric II period onwards, where it was applied to vessels of White Painted and from Cypro-Geometric III also of Black-on-Red Ware [34] (pp. 378–380).



Figure 18. Black Slip Bichrome II plate, AIS 0588.008, W. 4.6 cm, © Medelhavsmuseet.

Preliminary investigation of pottery from the sanctuary at Agia Irini offers a glimpse of the various sources of ceramic influence which must have extended from Lapithos in the north to Kition and Paphos in the south. In this respect and although this should be seen as a provisional conclusion, pottery from the sanctuary seems to confirm stylistic influence and affiliations as these were described by the terracotta analysis of Fourrier. The possible role of Soloi in this ceramic interplay with Agia Irini may be approached only indirectly. Previously mentioned results of chemical analyses can be corroborated by comparisons with the sanctuary at Myrtou-Pigadhes [51], a cultic place situated close to Agia Irini that was also possibly related to the realm of Soloi [18] (p. 92). Myrtou-Pigadhes prospered in the Late Bronze Age. The final occupation of this sanctuary (Period 8) produced pottery dated between the Cypro-Geometric I and Cypro-Archaic I, although, as in the case of the Agia Irini sanctuary, the unbroken continuity of the site remains questionable.

Iron Age pottery from Myrtou-Pigadhes [51] (pp. 60–74) displays a wide range of shapes, techniques and styles that indicate connections with different parts of the island. However, there are some similarities with the pottery from Agia Irini (both published and unpublished). These may be due to similar political/cultural associations for the two neighbouring sanctuaries and can be summarised as follows: presence at both sites of stemmed goblets, although the ones from Agia Irini are usually later and date to the Cypro-Archaic I period [9] (plate CLXXXVII, last row: from Period 5), [51] (p. 63, figure 26); Black Slip jugs are well attested at both sites [9] (plate CLXXXVII.2), [51] (p. 70, figure 29). In the case of Myrtou-Pigadhes Black Slip vessels also include open shapes such as dishes, the presence of which at Agia Irini is dubious. Another common ceramic feature in both sanctuaries is the presence of small ridge-necked juglets produced in the White Painted and Black-on-Red technique, the majority of which are decorated with concentric circles [9] (plate CLXXXVIII.1, Period 4, third row), [51] (p. 65, figure 27; p. 70, figure 29). Moreover, the large number of bowls (both deep and shallow) and plates is a common feature both at Myrtou-Pigadhes and at Agia Irini [9] (plate CLXXXVIII.1, Period 4, two bottom rows, plate CLXXXVIII.2, Period 6, two bottom rows), [51] (p. 63, figure 26, p. 70, figure 29, p. 71, figure 30) suggesting that drinking and dining were important aspects of the cultic activity at both sites. With regard to Agia Irini, the presence of Plain White jugs, bowls and plates [9] (pp. 774, 777), confirmed also by the examination of the unpublished pottery from the sanctuary (**Figure 19**), stresses the importance of food and drink consumption for which unassuming low-cost pottery was also utilised. Dining and drinking were embedded in cult and probably also favoured meeting and societal negotiation between different groups of people. Such consumption patterns were verified also through excavation at Agia Irini, since large waste material consisting of ash, animal bones and carbonised matter was found intermixed with pottery sherds [10] (p. 152), indicating both the sacrifice and the consumption of animals. That food preparation probably involved grinding, is suggested by the presence of mortaria, both in the published and in the unpublished material. One of them, classified as Plain White V (**Figure 20**) [9] (p. 773, no. 2747, plate CLXXXVII.4, Period 5, first row, second from left), was used as a cover of a pithos, suggesting a close link between storage and food consumption. Mortaria of this type and fabrication are a common Cypriot product of the 7th and 6th centuries BC and occur also outside of Cyprus, for example at Miletus [52] (pp. 320–321, figure 1a). Their use may have been symbolic as well as practical, since ingredients grinded in them could be used to spice up the banquet or any food that was meant to be consumed in a slightly more formal setting [52].

When looking for further evidence of storage, it becomes evident that storage at Agia Irini is mostly linked to the earliest history of the site. Storage vessels—primarily pithoi—from Period 1, dated by the excavators to the Late Cypriot III, were included in the publication of the sanctuary [9] (p. 774, nos. 2775, 2781–2783). Although some of the pithos fragments were found in Rooms V and VI that constituted the cult house proper [14] (pp. 54–57), the northern unit of the Late Bronze Age complex (Rooms I, II and III) that were of secular character, also produced pithoi and other vases that were not described in the publication of the site [14] (p. 57). This incomplete knowledge of the pithos fragments produced at Agia Irini does not allow comprehensive views of the site's storage capacity in the Late Bronze Age; nonetheless, this must have been larger than what is implied by the publication.

When moving to the Iron Age, when the site has a purely *temenos* function, storage vessels constitute, once again, just a small fraction of the published material. However, the sanctuary's engagement in economic transactions and the possibility of storage is clearly reflected on the presence of pithoid vessels or jars, as in the case of a Plain White IV torpedo jar from Period 5 (ca. 600–540 BC) [9] (p. 681, no. 201, plate CLXXXVII).

Associations between pottery finds and architecture are questionable at Agia Irini, especially for the Iron Age phase of the sanctuary. Although most of the Late Bronze Age finds came from the three building-complexes that were dated to Period 1 (Building I–X, Walls 1–25) [9] (p. 665, figure 263), Iron Age pottery came from the whole area of the *temenos* even though the density was greater near the altar. With the exception of the altar, the *peribolos* wall and the so-called tree-enclosure [9] (p. 665, figure 263) there was no major architectural element at the sanctuary of Agia Irini during the Iron Age. Due to the convoluted stratigraphy of the sanctuary it is hard to establish at this stage clear associations between pottery finds and architectural elements. Nevertheless, this pottery analysis shows that the sanctuary of Agia Irini displays certain features that tend to support its role as a central meeting place. These can be summarised in the plurality of pottery styles represented at the sanctuary that suggest contacts and interaction with many different parts of the island, as well as in the consumption of food and drink, based primarily on the shapes of the pottery produced during the excavation of the site. The pottery from the sanctuary, both published and unpublished, belongs to common types of Cypriot fine ware that are well-attested throughout the island. Special features are rather rare, the main exception being the figured decoration of a grazing male goat depicted on a White Painted I stemmed goblet, a suitable subject for a sanctuary that was closely associated with the control of a fertile agricultural area.



Figure 19. Plain White IV shallow bowl A.I.S. 0368.001, H. 4.7 cm, © Medelhavsmuseet.



Figure 20. Mortarium, A.I. 2747, D. 28 cm, ©Medelhavsmuseet.

What also remains dubious, based on pottery evidence alone, is the designation of the sanctuary's political affiliation that usually oscillates between Soloi and Lapithos. Ceramic affinities with the area of Lapithos do exist but this is hardly surprising given the openness of Agia Irini sanctuary to the pottery styles of many areas of Cyprus. The investigation of ceramic links between Agia Irini and Soloi, with which the sanctuary was most possibly associated, is hampered by our incomplete knowledge of the Cypro-Geometric and early Cypro-Archaic Solian production. However, comparisons between Agia Irini and the neighbouring sanctuary at Myrtou-Pigadhes, outline resemblances in both the sequence of phases and in the ceramic record. Such resemblances may reflect that Iron Age Agia Irini was the main/central sanctuary within a larger network of cultic places situated in liminal areas between different areas or polities.

5. Conclusions: An Extra-urban Sanctuary as a Central Place

Evaluating the implications of transforming an extra-urban space into a 'central place' can be made via an analysis of its centrality, that can be measured after considering interactions taking place in this space [43]. Archaeological context and iconography, landscape and ceramic (pottery and terracottas) analysis, taken altogether, manifest how an 'un-central' area, in what seems to have been the outskirts of the territory of Soloi, came to become a 'central place.' As the power and the process of territorialisation of the Cypriot Iron Age polities was moving towards consolidation at the end of the Cypro-Geometric period, specific extra-urban sanctuaries acquired such a central spatial and mental position.

When one wishes to approach the centrality of these extra-urban sacred spaces, the sanctuary of Agia Irini can contribute significantly to our understanding of the function(s) of these spaces due to its uniquely preserved and well-documented archaeological context. In this context and in line with the concept of this *Land* Special Issue, one has to consider the importance of 'central persons'—in that case the Cypriot Iron Age elite (not to say of the Cypriot *basileis*)—in the process of transforming a space into a 'central place.' The presence of ritually and symbolically significant iconography (in the case of Agia Irini clearly manifested through its terracotta votive offerings), the manifestation of an elite status at the site, its relation and proximity to natural resources and other sites and its function as a meeting space between various intra- and inter-regional communities, make the sanctuary an exemplar case study.

There is no static centrality but only historical processes causing different places to have different profiles of centrality, interaction and network relations for certain periods of time. Thus, the abandonment of the sanctuary before the end of the Cypro-Archaic period should be

related with historical developments [8] that, however, are difficult to read in the archaeological record or the development of ancient landscapes. This problem becomes even more complicated when we consider that Agia Irini is currently scientifically inaccessible due to the Turkish occupation and the current political status of the island.

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Landscape and Hunting. The Economy of the *Eschatia*

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Abstract: This paper explores the place of ancient Greek hunting within the Greek landscape and environment, with particular reference to the *eschatia*, the marginal, uncultivated (or marginally cultivated) land. It is part of a bigger project on the social history of hunting in archaic and classical Greece, where emphasis is placed on the economic and dietary contribution of hunting for Greek communities. Hunting has attracted scholarly attention, mostly as a result of the role that hunting narratives play in Greek mythology, and the importance of hunting scenes in Greek art. Rather than talking about the role of hunting in rites of passage, I would like to explore the relationships of different social classes to hunting (which is understood here to include all forms of capturing animals on land, including trapping and snaring). The ‘un-central’ landscape of the *eschatia* appears to be an important locus for hunting practices, and therefore, a productive landscape. Hunting in the *eschatia* was opportunistic, required minimum effort in terms of crossing distances, allowed access to game that could be profitable in the market, and made the transport of game easier to manage.

Keywords: hunting; *eschatia*; bird hunting

1. Introduction: The Greek Polis, the Environment and Ancient History

The history of the archaic and classical Greek world (8th–4th century BCE) has been traditionally seen as the history of a specific state formation: that of the polis. A Greek polis, or city-state, was understood as a community of people (adult male citizens) that exercised sovereignty over a specific territory. This focus on the Greek polis has important repercussions for how we understand the Greek world, how we write the history of the Greek world, and how we teach this history in our institutions. Indeed, if one looks at the syllabi of modules addressing the history of the Greek world in the archaic and classical periods in UK universities (of which I am more familiar), they will see a focus on the history of the polis, with particular emphasis on the history of a handful of poleis, especially classical Athens. In that, the ancient polis, and especially Athens, has been accorded a central place in our historical narratives. This is partly due to the nature of our written evidence for the classical period, which overwhelmingly originates from Athens or addresses the history of that city. But what about the rest of the Greek world, or the often neglected constituent element of the polis, that is, its landscape?

One of the most important recent developments in the field of Ancient History in recent years is the increasing attention paid to the role of the landscape as an important factor shaping human experiences, activities, and culture. In this respect, ancient historians are probably slightly late in adopting developments that have a longer trajectory in the field of Classical Archaeology. The impact, for example, of landscape surveys on our understanding of ancient material culture has been tremendous, and grows yearly with new archaeological fieldwork taking place. I would highlight as a turning point for the importance of landscape, and the environment in ancient history narratives, the publication in 2000 of Horden and Purcell’s *The Corrupting Sea* [1]. The book’s emphasis on the Mediterranean environment as one characterized by geographic fragmentation and increased maritime connectivity, which minimized risk posed by environmental factors, has truly transformed

our discipline. The other major contribution of that approach was a shift from historical narratives of essentially urban conglomerations, which, for the Greek world, inevitably meant the world of the polis, to historical narratives that look at the landscape and the environment as the space where human activity should be explored.

This is my starting point: an increasing need for ancient historians to explore the history of the Greek world beyond the history of the major urban centres, the poleis [2]. Ancient historians of social history have long recognized the need to look at social groups beyond the adult male citizen: women, slaves, and foreigners are now at the heart of much exciting new work in ancient Greek history. Indeed, one of the most fruitful, in my opinion, developments in this respect is the adoption of intersectionality as an important new approach used to explore social groups [3]. We need to adopt the same diverse outlook when we explore the geography of the Greek world: we need, in other words, to move beyond the history of Athens, Sparta, and the other poleis and their elite male citizens. The history of the Greek landscape and its uses by communities and groups that go beyond the adult male citizen of the Greek polis is a fascinating history that can enrich our understanding. One problem that I will explore further below is the limitation of our written sources, which, on the whole, focus on the elite male citizen and his experience. But I think that a careful examination of the evidence allows us to explore the non-elite point of view. We are used in ancient history to writing narratives from scraps and fragmentary evidence: the lack of explicit sources should not be seen as a hindrance.

2. Ancient Greek Hunting beyond the Elite

Writing a social history of ancient Greek hunting allows us to combine a focus on the landscape and its uses, with an interest in social groups beyond the adult male citizen. We are fortunate in that we have plenty of ancient literary and iconographic sources for Greek hunting in the archaic and classical periods. Primary amongst the literary evidence are the so-called 'hunting manuals' written by ancient authors. Of this particular genre, Xenophon's and Arrian's works are probably the best known [4]; we also have the later works by Oppian, Nemesianus, and Grattius [5]. These literary works offer detailed information about ancient hunting. The main focus, however, is what I would call elite hunting, that is, the hunting of mammals, especially hares, often using dogs. Hunting dogs could be very expensive and sought after, as the anecdote of Alcibiades' dog in Plutarch reveals [6]. Indeed, Xenophon's *Cyngeticus* spends considerable time discussing the appropriate use of different breeds of dogs for different types of hunt. This type of hunting, which also often included the use of horses, primarily concerned the elite. The hunting of hares using dogs or the hunting of boar and deer (often on horseback) is better understood as a pastime or hobby (or indeed even sport) rather than as a necessary activity for the acquisition of meat. On the other side of the evidence spectrum, we have the iconographic evidence on pottery. Such evidence includes many depictions of hunting; these depictions, however, mostly concern mythical narratives, such as the hunt of the Calydonian boar, rather than actual hunting practices [7]. The mythical depictions of hunting may be rooted in the actual hunting experience of the audience of this iconography, but still, such iconography relates to elite hunting practices. So the majority of both literary and iconographic evidence relates to elite hunting experiences, and includes depictions of hunting primarily of boar, deer, and hare.

This feature of our sources, that is, its elite preoccupation, has influenced modern approaches to Greek hunting. On the whole, modern works focus on the type of hunting that ancient sources talk about, that is, the hunt mostly by elite men of deer, boar and hare [8]. The role of hunting as preparation for the (young) elite men to become full citizens and warriors is also the focus of much recent work. This approach, which sees myths about hunting as versions of rites of passage, has been extremely influential, especially in works interpreting iconographic depictions of hunting and the use of hunting as allusions for homosexual relationships [9]. Yet, while such a structuralist approach has enriched our understanding of myth and its relationship with social practices, it is less useful as a way of understanding the social practice of hunting beyond the elite male point of view.

Despite the ancient and modern preoccupation with elite hunting, there is a plethora of evidence that may be able to help us write the history of hunting beyond the elite. Such a social approach to ancient Greek hunting situates hunting practices within the landscape of the Greek world, and considers it not as an elite pastime but as an important contribution to the alimentary needs of the community. My definition of hunting includes all methods for the capture of animals on land, including trapping, snaring, and netting. It is very likely that such forms of hunting are not pre-eminent in the hunting manuals and main literary sources of the classical period, because they did not promote the kind of male morality and ideology that big game and hare hunting seem to have promoted. A passage from Plato's *Laws* (824a–c) provides an illuminating example of this attitude. The Athenian stranger in the passage here presents the ideal city's legislation in relation to hunting; in doing so, Plato openly disapproves of fishing and angling, as well as setting traps, hunting at night, or hunting at the edges of cultivated land, as these forms of hunting do not elevate men [10]. According to the legislator in the ideal city, "only the best kind of hunting is allowed at all—that of quadrupeds, which is carried on with horses and dogs and men's own persons, and they get the victory over the animals by running them down and striking them and hurling at them, those who have a care of godlike manhood taking them with their own hands" (824a). In other words, Plato allows only the form of hunting that the elite practised: that of quadrupeds on land with horses and dogs, and not any form of capturing animals by traps, nets, or snares. Plato fully articulates here the implied bias against other forms of hunting that exists in Xenophon's writing. But, as mentioned previously, despite this ideological position of ancient authors, there are a number of indicative references to nets, traps, and snares, which, as Plato's legislation implies, must have been common practice for capturing animals on land (which therefore made Plato include them in his legislation). It is to these references we now turn.

3. Netting, Trapping and Snaring: The Evidence from the Epigrams

A number of funerary and dedicatory epigrams from the Palatine Anthology (a late Byzantine compilation of epigrams, including many from the Hellenistic period) refer to nets, traps, and other equipment used in hunting animals. Such references are indeed numerous, so I will only discuss a handful of examples [11].

A funerary epigram for Eumelus, written by Isidorus of Aegae in the first century BCE (7.156), is typical of the genre of epigrams referring to hunting equipment:

'By his bird-lime and canes Eumelus lived on the creatures of the air, simply but in freedom. Never did he kiss a strange hand for his belly's sake. This his craft supplied him with luxury and delight. Ninety years he lived, and now sleeps here, having left to his children his bird-lime, nets, and canes' (translation by W.R. Paton). [12]

This example uses some typical elements of a funerary epigram: the deceased died old and lived in idealized autarchy and freedom. What is interesting for our purposes is the allusion to bird-lime, nets, and canes. These were used for the hunting of birds; indeed, this type of hunting would not have been allowed in Plato's ideal city, as it did not involve the pursuit of quadrupeds on land. Similar themes can be found in two further funerary epigrams included in the Anthology: that by Mnasalcas of Sicyon (7.171) and by Antipater of Sidon (7.172). In both epigrams, the deceased appears to have hunted birds, using sticks with bird-lime in the first and slings in the second.

It is the dedicatory epigrams included in book 6 of the Anthology, however, where more references to nets, sticks, traps, and bird-lime can be found. An epigram by Antipater describes the huntsman Craugis' dedication of nets, snares, traps, cages, nooses, stakes, canes, and cords to Pan the Scout (*skopietas*) (6.109) [13]. The list of equipment used in hunting is truly impressive and implies a specialized practice targeting birds. Another dedicatory epigram written by Philip of Thessalonike mentions the dedication of a spear, nets, nooses, and traps (6.107) [14]. The dedication to the god Pan the Ranger of the Forest (*hyleskopos*), who here appears with a different cult epithet, seems to

have taken place towards the end of the hunting career of the dedicant. The hunting in this epigram includes targeting quadrupeds (the spear and foot traps), but it may have also targeted birds (hunting nets and nooses).

Perhaps the most famous epigram in this category of dedication of hunting equipment to deities is the epigram by Leonidas, writing in the 3rd century BCE, on the dedication to Pan of the nets of three brothers (6.13) [15]. The epigram reads as follows:

‘Huntsman Pan, the three brothers dedicated these nets to you, each from a different chase: Pigres these from fowl, Damis these from beast and Clitor his from the denizens of the deep. In return for which send them easily caught game, to the first through the air, to the second through the woods, and to the third through the shore-water.’ (translation by W.R. Paton)

This particular theme, of the three brothers dedicating three types of nets to Pan, had a very prominent afterlife. The same variation can be found in a number of other dedicatory epigrams included in the Palatine Anthology [16]. The popularity of the theme can be attested to by its inclusion on a fresco in the house of the Epigrams in Pompeii. The relevant room was decorated with five large frames, all depicting scenes from epigrams [17]. The dedicatory epigram of Leonidas was inscribed next to a mural depicting three young men, each with a net (*CIL* IV 3407 = *SEG* 15.602 = *SEG* 45.1455). The choice of the theme of the dedication of the hunting/fowling/fishing nets for the mural in this Pompeian house implies that the epigram was well known among elite Roman circles in Pompeii and elsewhere.

Nets, traps, snares, and sticks with bird-lime, therefore, appear often in epigrams. Such references must reflect the reality of hunting techniques and equipment. At the same time, the funerary and dedicatory epigrams included in the Palatine Anthology are not necessarily ‘real’ epigrams for ‘real’ people. In many cases, they represent literary exercises by scholars, who show their artistic expertise and literary influences by composing epigrams on the same themes. Indeed, the many variations on Leonidas’ epigram of the dedication of the three brothers shows exactly how popular such exercises of composition must have been. That said, the relationship between epigrams as literary exercises and epigrams for real people (such as inscribed epigrams on tombstones) is a very complex one; we cannot claim that there is a visible dividing line between the two types of epigrams [18]. Allusions in epigrams to hunting equipment cannot be explained solely as a popular literary theme. Rather, they should be placed within the context of references to hunting that did not belong to the elite hunting of big mammals and hares which was so favoured in our literary sources and hunting manuals. Indeed, epigrams are only one part of the ancient evidence that alludes to the use of snares, traps, and lime-glue for the hunting of birds [19].

Despite the problems with the nature of the evidence from epigrams, therefore, it is clear from a wide range of references that while hare, boar, and deer hunting dominated the literary narratives, there was a widespread practice that involved aspects of hunting that did not necessarily involve the elite. We have already seen how Plato disapproves of hunting on tilled and sacred land, at the edges of agricultural land, and during the night in his discussion of hunting practices and related regulations in his ideal city in his *Laws* [20]. The implication here is, I think, that trapping, night hunting, and hunting at the edges of agricultural land were relatively widespread practices and that is why the legislator in Plato felt the need to prohibit such activities. It is this particular point that I want to explore: the importance of the edges of the agricultural land as a suitable landscape for hunting.

4. Hunting in the Eschatia

In order to understand the role of the edges of agricultural land as an important locus for hunting, we need to place this type of landscape within the context of productive land. It is true that one of the most important generators of wealth in Greek antiquity was agricultural production. Indeed, considering the Greek mentality that stressed *autarkeia* (self-sufficiency) as an ideal for all units of

the community (from the *oikos*, the household, to the polis), wealth produced by agriculture was the most socially accepted wealth. We now understand that the concept of ‘self-sufficiency’ was an ideal, and indeed, had little relevance to the ancient realities of economic production, consumption, and exchange. Agricultural land and produce may have been at the heart of the ancient Greek economy and ideals about economic self-sufficiency, but production beyond agriculture was also important. In this particular context, the edges of cultivated land, the *eschatia* in ancient sources, should also be seen as productive land [21]. In other words, the landscape beyond the agricultural tilled land, including the *eschatia*, was productive and economically important. It may not have been as productive as a fertile field in the plain, but it was able to generate produce of some sort or other. Bee-keeping, such as the famous honey of Hymettus, charcoal burning, wood produce, all were important products of the *eschatia* [22]. We should also add hunting was an important activity taking place in this un-cultivated (and therefore partly ‘un-central’) landscape. Hunting in the *eschatia* could be seen as another example of what Horden and Purcell call ‘environmental opportunism’, where human opportunity and ingenuity integrate environments into the productive system, even when such integration contributes only a small part to the nutritional aggregate [23].

In ancient Greek literary works, the term *eschatia* implies mostly the farthest part of a country, or indeed the border of a territory [24]. In Greek lexicographers, in particular, the term is associated with marginal land, or marginally cultivated land, close to the mountains or the sea [25]. We are on more secure ground with the epigraphic attestations of the term. A new fragment of the Athenian accounts from Delos, dated to 330/29, refers to an *eschatia* on Delos; this, surely, implies a piece of land by the edge of the littoral, by the sea [26]. It is the attestations of the term *eschatia* in the Rationes Centesimarum, the Athenian inscriptions recording the 1% tax paid on sales of public land and property, that has attracted most scholarly attention [27]. As Stephen Lambert observed, the term *eschatia* is remarkably frequent in these inscriptions [28]. While it is undeniable that the application of the label *eschatia* to pieces of land in these accounts does not necessarily imply a consistent use, the frequency of the term does seem to imply that such marginal land was often carefully demarcated, and belonged as property to either individuals or the state and communal entities (demes etc.) as public land. The term *eschatia* therefore did not necessarily imply land located at the border of the Athenian polis (that is, of the Attic territory), but rather, designated land that was ‘at the edge’ [29]. This, more often than not, implied a piece of land at the edge of cultivated territory; following the lexicographers, this could mean sometimes by the sea or by the hills/mountains. If we are right in understanding *eschatia* as land characterized by its marginality to good arable land, then the *eschatia* could be rocky and similar to the land designated as *phelleus* [30]. As we have already seen, such marginal land was not necessarily unproductive land, but could be an important part of local production networks.

So did hunting take place in the *eschatia*? Most narratives about mythical hunting focus on the mountains or the forest. But such mythical narratives also involve animals that were not necessarily often hunted in classical Greece. Heracles’ lion hunting, for example, is unlikely to have been representative of an average hunting experience for most Greeks. It is true, we do hear of lions roaming in Macedonia (where presumably they would also be hunted), and we also have the spectacular story preserved in Pausanias of Polydamas, the Olympic winner of wrestling in 408, killing a wild lion on Mt Olympus with his bare hands [31]. I would argue, however, that despite the presence of such hunting stories in our literary sources, few Greeks in the classical period, especially in the southern Greek world, would have been engaged in such hunting experiences. The hunt of wild boar (*kapros*), contrary to that of lion, may have been relatively more widespread. But in contrast to modern times, when wild boar has proliferated in the southern Balkans due to mild winters, inter-breeding with domesticated boar (which produces a half-breed that breeds more piglets), and the abandonment of agriculture in many areas of modern Greece, it is unlikely that ancient boar in the classical period would enter cultivated zones [32]. So for boar and deer, which, along with hare, were the focus of elite hunt, the hunting territory would be predominantly the mountains and the forest.

Ancient narratives, therefore, pay attention to the mountains and the forest as the key territories where hunting would take place. The reason for this is their interest in the hunting of mammals, particularly deer, boar, and hare, which represented an elite form of hunting. The edge of the cultivated land, the *eschatia*, is not often discussed in our sources as a hunting landscape. Plato's prohibition, however, of hunting at the edge of cultivated land seems to imply that hunting did take place in such areas. Indeed, if we look closely at our ancient sources, we can see that hunting at the edge of cultivated land is occasionally mentioned. Both Xenophon's and Arrian's *Cynegetica*, which are key sources for elite attitudes and ideology related to hunting, stress the difficulty of hunting hares on rocky ground or on hills [33]. Both authors use the word *phelleus* to designate the rocky land where the hunting of hare becomes difficult; as we have already seen, the land designated as *phelleus* shares many similarities with the *eschatia* in our Athenian sources. It is very likely, therefore, that hunting in the *eschatia* is among the landscapes that Xenophon and Arrian have in mind when discussing the hunting of hares.

Indeed, there is enough evidence, especially about bird hunting, to suggest that the *eschatia*, the edge of cultivated land, was ideal for other forms of hunting, such as bird hunting, which did not attract the approval of ancient writers such as Xenophon, Plato, or Arrian. The practice of using lime-glue and nets to capture birds, in particular, was more productive at the edge of cultivated land rather than deep in the forest or up in the mountains. We have one remarkable piece of evidence that does suggest that opportunistic hunting within cultivated land, or at the edge of cultivated land, was an important feature of bird hunting. A letter of Alciphron, included in his second book of *Letters of Farmers*, describes how a farmer put glue directly on the tree itself in order to capture birds (2.27). The setting is particularly important: the farmer in this letter complains that the winter is severe and everything is covered by snow, making any agricultural work impossible. While he was sitting idle in his cabin, he saw a flock of blackbirds (*kopsichos*) and thrushes (*kichle*); he immediately set out and put lime-glue (*ixos*) on the wild pear-tree branches. The exercise was very successful: the farmer writes to his friend that he is sending him twenty-five of the birds, implying that the overall catch was much larger [34]. This is an important source for the practice of putting lime-glue on the tree itself rather than on sticks that were then placed at strategic locations [35]. The farmer in this letter is not presented as a dedicated professional hunter; rather, the hunting of birds with the use of lime-glue should be understood as a supplementary addition to his overall agricultural production. The capture of birds in such large numbers becomes especially important because of the time of year: in the winter, the capture of animals became more difficult, and therefore, the calorific importance of hunted birds even more significant. In addition, blackbirds, and especially thrushes, were considered a delicacy and were sought after in the ancient world [36]. This particular source highlights the importance of opportunity for the hunt: the farmer did not set out to go hunting, but spotted the opportunity to capture birds and immediately proceeded to do so using lime-glue (and he therefore engaged in a form of hunting of which Plato would not approve). The location is also important: the farmer 'peeped out of his cabin' (προκύψας δῆτα τῆς καλύβης) and he spotted the flock of birds. The word cabin or hut (*kalybe*) is significant: it provides an important rustic setting for the episode, and implies a certain degree of poverty. The hunt itself takes place exactly on the borders of cultivated land, on the *eschatia*, even though this specific word is not used by Alciphron. It must be close to the farmer's cabin so that the farmer can spot the opportunity, but at the same time, the presence of a wild-pear tree (*achras*) implies a not-fully-cultivated landscape. I suggest that the wild pear tree was located at the borders of the farmer's land, and therefore, created a marker between the cultivated landscape and the wilderness beyond.

I have used Alciphron's letter as a straightforward source for actual practices of hunting. Yet, while I believe that we can use it in this manner, the letter itself has many additional layers. Alciphron is engaging in developing a genre that has strong inter-textual elements [37]; he creatively uses a number of previous authors and genres, among which, at least for his second book that includes the letters of farmers, Theocritus is perhaps one of the most important. Recent work on Alciphron has underlined

how Alciphron is interested in hierarchies of statuses, and how he creates a literary construct that focuses on low-status individuals (especially in the second book) [38]. Alciphron's interest in low status (or low class) individuals is particularly important. Such a focus may have to do with the complex interplay between Alciphron and the kind of literature and genre he is engaging with; but as Alciphron is using classical Greek texts (such as Menander), the image of the farmer engaged in opportunistic hunting of birds seems to tap into realities of actual practices. The specific reference to lime-glue applied to the tree directly (rather than to sticks) seems to imply intimate knowledge of an actual practice. Despite, therefore, the multi-layered allusions and the complex construction of reality in Alciphron's letters, I do think it is valid to use it as a source that highlights low-class hunting experiences based on marginal location and opportunity.

5. Hunting and the Market

Location and opportunity, therefore, mattered when it came to hunting. Indeed, the distance of the hunting landscapes from urban centres was a very important parameter, and one which, unfortunately, tends to be ignored in modern works on hunting. My understanding of hunting includes, as I have already stated, practices that may be understood as widespread, involving the community beyond the elite circles. In that context, the importance of the market is paramount. The kind of hunting I am looking at involved procuring game for the market, and did not simply aim at consumption by the hunters and their families and friends. We know that game was sold and bought in the market. The Athenian agora had a space allocated for the selling of birds, which must have included both live birds and game procured through hunting [40]. We also have a great number of references in Old Comedy, mostly preserved as fragments in Athenaeus' *Philosophers at Dinner*, referring to game bought and sold in the market (Athen. 694b–656a). Indeed, our classical sources include an impressively large list of game products consumed in Athens; these must have been the result of hunting. In addition to boar, hare, and deer, we have references to francolin (*attagas*), goose, duck, coot (*phalaris*), purple coot (*porphyron*), pigeon, partridge and of course, thrushes and blackbirds, to name a few of a very long list of game [41]. If the ancient Athenians were able to buy all these different types of game in the market, then surely the implication is that there was considerable hunting taking place in the Athenian countryside. The selling of birds, in particular, was the end-product of a type of hunting that did not involve the elite. I would argue that the selling of hare in the market was also the result of non-elite hunting. I doubt that young men chasing hare with specialized dogs, that is, men engaged in the type of hunting that Xenophon pays attention to, would end up selling their catch in the market. It seems far more likely that game caught as a result of elite men going on a hunt would have been consumed by the hunters themselves.

The preservation of game as also an issue that needed to be taken into consideration. One of Plutarch's questions in his *Quaestiones Convivales* (*Moralia* 657f–659) is 'Why Flesh Stinks Sooner When Exposed to the Moon than to the Sun'. Plutarch's answer to this question includes a section about the best way to preserve meat; the answer is to put a bronze nail through the carcass to delay putrefaction. Plutarch's solution to the problem does not work, but the question itself shows that the swift transfer of game from the location of hunting to the centre of consumption (occasionally via the market and the process of exchange) was of paramount importance.

If we consider, therefore, the importance of the market for hunting, and of the logistics of transferring game from the hunting location to the place of exchange and finally the place of consumption, the importance of the *eschatia*, the edge of cultivated land, becomes even more visible. Hunting in the *eschatia* provided many advantages for hunting: it was opportunistic (as in the letter by Alciphron where the farmer spots the birds sitting on a tree from his own cabin), required minimum effort in terms of crossing distances (compared to the forest or the mountains), allowed access to game that could be profitable in the market (such as the delicious thrushes and blackbirds), and made the transport of game easier to manage.

6. Conclusions

Our written sources, with their ideological viewpoint, stress elite ideology and practice, often obscuring the importance and widespread practice of hunting by the non-elite. Non-elite hunting used nets, traps, snares, and lime-glue either on sticks or applied on the tree itself (in the case of birds), and could be practiced at the edge of cultivated land. The importance of markets, and proximity to markets, is another aspect that we need to take into consideration when examining the importance of hunting as a non-elite practice. My aim is to place hunting firmly in a historical account that explores the role of the environment in human activity: in that sense, ancient sources and their elite ideology and modern narratives that stress the role of hunting as a rite of passage for the young to prepare for war and citizenship do not help us understand the complex interplay between humans, animals, and the environment.

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 10. Plato *Laws* 823e-824c: ὦ φίλοι, εἴθ' ὑμᾶς μήτε τις ἐπιθυμία μή τ' ἔρωσ τῆς περὶ θάλατταν θήρας ποτὲ λάβοι μηδὲ ἀγκιστρείας μηδ' ὄλωσ τῆς τῶν ἐνύδρων ζώων, μήτε ἐγρηγορόσιν μήτε εὐδουσιν κύρτοις ἀργὸν θήραν διαπονουμένοις. μηδ' αὖ ἄγρας ἀνθρώπων κατὰ θάλατταν ληστείας τε ἕμερος ἐπελθὼν ὑμῖν θηρευτὰς ὠμούς καὶ ἀνόμους ἀποτελοῖ: κλωπείας δ' ἐν χώρᾳ καὶ πόλει μηδὲ εἰς τὸν ἔσχατον ἐπέλθοι νοῦν ἄφασθαι. μηδ' αὖ πτηνῶν θήρας αἰμύλος ἔρωσ οὐ σφόδρα ἐλευθέριος ἐπέλθοι τιγὶ νέων. πεζῶν δὲ μόνον θήρευσίς τε καὶ ἄγρα λοιπὴ τοῖς παρ' ἡμῖν ἀθηταῖς, ὧν ἡ μὲν τῶν εὐδόντων αὐ κατὰ μέρος, νυκτερεῖα κληθεῖσα, ἀργῶν ἀνδρῶν, οὐκ ἀξία ἐπαίνου, οὐδ' ἦττον διαπαύματα πόνων ἔχουσα, ἄρκυσιν τε καὶ πάγαις ἀλλ' οὐ φιλοπόνου ψυχῆς νίκη χειρουμένων τὴν ἄγριον τῶν θηρίων ῥώμην: μόνη δὲ πᾶσιν λοιπὴ καὶ ἀρίστη ἢ τῶν τετραπόδων ἵπποις καὶ κυσὶν καὶ τοῖς ἑαυτῶν θήρα σώμασιν, ὧν ἀπάντων κρατοῦσιν δρόμοις καὶ πληγαῖς καὶ βολαῖς αὐτόχειρες θηρεύοντες, ὄσοις ἀνδρείας τῆς θεῖας ἐπιμελές. τούτων δὲ πάντων ἔπαινος μὲν πέρι καὶ ψόγος ὁ διειρημένος ἂν εἴη λόγος, νόμος δὲ ὅδε: τούτους μηδεὶς τοὺς ἱεροὺς ὄντως θηρευτὰς κωλυέτω ὅπου καὶ ὅπῃπερ ἂν ἐθέλωσιν κυνηγετεῖν, νυκτερευτὴν δὲ ἄρκυσιν καὶ πλεκταῖς πιστὸν μηδεὶς μηδέποτε ἔαση μηδαμοῦ θηρεῦσαι: τὸν ὀρνιθευτὴν δὲ ἐν ἀργοῖς μὲν καὶ ὄρεσιν μὴ κωλυέτω, ἐν ἐργασίμοις δὲ καὶ ἱεροῖς ἀγρίοις ἐξεργέτω ὁ προστυγχάνων, ἐνυγροθηρευτὴν δέ, πλὴν ἐν λιμέσιν καὶ ἱεροῖς ποταμοῖς τε καὶ ἔλεσι καὶ λίμναις, ἐν τοῖς ἄλλοις δὲ ἐξέστω θηρεύειν, μὴ χρώμενον ὁπῶν ἀναθολῶσει μόνον. Ο friends, we will say to them, may no desire or love of hunting in the sea, or of angling or of catching the creatures in the waters, ever take possession of you, either when you are awake or when you are asleep, by hook or with weels, which latter is a very lazy contrivance; and let not any desire of catching men and of piracy by sea enter into your souls and make you cruel and lawless hunters. And as to the desire of thieving in town or country, may it never enter into your most passing thoughts; nor let the insidious fancy of catching birds, which is hardly worthy of freemen, come into the head of any youth. There remains therefore for our athletes only the hunting and catching of land animals, of which the one sort is called hunting by night, in which the hunters sleep in turn and are lazy; this is not to be commended any more than that which has intervals of rest, in which the wild strength of beasts is subdued by nets and snares, and not by the victory of a laborious spirit. Thus, only the best kind of hunting is allowed at all—That of quadrupeds, which is carried on with horses and dogs and men's own persons, and they get the victory over the animals by running them down and striking them and hurling at them, those who have a care of godlike manhood taking them with their own hands. The praise and blame which is assigned to all these things has now been declared; and let the law be as follows: —Let no one hinder these who verily are sacred hunters from following the chase wherever and whithersoever they will; but the hunter by night, who trusts to his nets and gins, shall not be allowed to hunt anywhere. The fowler in the mountains and waste places shall be permitted, but on cultivated ground and on consecrated wilds he shall not be permitted; and any one who meets him may stop him. As to the hunter in waters, he may hunt anywhere except in harbours or sacred streams or marshes or pools, provided only that he do not pollute the water with poisonous juices. (translation by Benjamin Jowett). Detienne, M.; Vernant, J.-P. *Cunning Intelligence in Greek Culture and Society*; Harvester Press: Atlantic Highlands, NJ, USA, 1978; p. 33. ISBN 0391007408.
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12. *Pal. Anth.* 7.156: ἰξῶ καὶ καλάμοισιν ἀπ' ἡέρος αὐτὸν ἔφερβεν Εὐμηλος, λιτώς, ἀλλ' ἔν' ἔλευθερίῃ. οὐποτε δ' ὀθνηνίην ἔκουσεν χέρα γαστρὸς ἔκητι. τοῦτο τρυφὴν κείνω, τοῦτ' ἔγερ' εὐφροσύνην, τρις δὲ τριηκοστὸν ζήσας ἔτος ἐνθάδ' ἰάυει, παισὶ λιπῶν ἰξὸν καὶ περὰ καὶ καλάμους.
 13. *Pal. Anth.* 6.109: 'Craugis the huntsman, son of Neolaidas, an Arcadian of Orchomenus, gives to thee, Pan the Scout, this scrap of his old fowling-net (γηραλέον νεφέλας τρυχός), his triple-twisted snare for the feet (τριέλικτον ἰχνοπέδαν), his spring-traps made of sinews (νευροστενεῖς παγίδας), his latticed cages (ἀμφίρωγας κλωβούς), his nooses for the throat which one draws up (ἀνάσπαστους δεράγχας), his sharp stakes hardened in the fire (πυρὶ θηγαλέους ὄξυπαγείς στάλικας), the sticky moisture of the oak (εὐκόλλον δρυὸς ἰκμάδα), the cane wet with it that catches birds (πετηνῶν ἀγρευτῶν ἰξῶ μυδαλέον δόνακα), the triple cord which is pulled to close the hidden spring-net (κρυφίου τρίκλωστον ἐπισπαστήρα βόλοιο), and the net for catching by the neck the clamorous cranes (ἄρκυν κλαγερῶν λαυμοπέδαν γεράνων)' (translation by W.R. Paton).
 14. *Pal. Anth.* 6.107: 'The huntsman Gelo dedicates to Pan, the ranger of the forest, me, his spear (λόγχην), the edge of which time has worn by use, also the old rags of his twisted hunting nets (λίων πολυστροφῶν γεραῖα τρύχη), his nooses that throttle the neck (πάγας δεραγχεάς), his foot-traps, made of sinews, quick to nip beasts by the leg (νευροπλεκεῖς κνωδάλων ἐπισφύρους ὠκέεις ποδίστρας), and the collars, masters of his dogs' necks; for time has overcome his strength and he has now renounced wandering over the hills' (translation by W.R. Paton).
 15. *Pal. Anth.* 6. 13: Οἱ τρισσοὶ τοι ταῦτα τὰ δίκτυα θῆκαν ὁμαιμοὶ, ἀγρότα Πάν, ἄλλης ἄλλος ἀπ' ἀγρεσίης. ὦν ἀπὸ μὲν πτηνῶν Πίγρης τάδε, ταῦτα δὲ Δάμις τετραπόδων, Κλείτωρ δ' ὁ τρίτος εἰναλίω. ἀνθ' ὦν τῶ μὲν πέμπτε δι' ἡέρος εὔστοχον ἄγρην, τῶ δὲ διὰ δρυμῶν, τῶ δὲ δι' ἡρίων.
 16. *Pal. Anth.* 6.14, by Antipater of Sidon, four variations by Archias (6.16, 6.179, 6.180, and 6.181), and more: See 6.11, 6.12, 6.15, and 6.182–187. On Leonidas' epigram of the three brothers and the subsequent variations see Longo, O. Leonid: *AP VI*, 13 e la sua fortuna (cacciatori, uccellatori, pescatori). In *Museum Criticum* 1986–1987 21–22, pp. 277–302. Gutzwiller, K.J. *Poetic Garlands. Hellenistic Epigrams in Context*; University of California Press: Berkeley, CA, USA, 1998; pp. 241–245. ISBN 9780520208579.
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 28. 26% of the properties in the *Rationes Centesimalium* are designated as *eschatia*: Lambert, S. *Rationes Centesimalium: Sales of Public Land in Lykourgan Athens*; J.C. Gieben: Amsterdam, The Netherlands, 1997; pp. 225–229. ISBN 9789050631570. Papazarkadas, N. *Sacred and Public Land in Ancient Athens*; Oxford University Press: Oxford, UK, 2011; p. 134. ISBN 9780199694006.
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 30. Harpocration s.v. Φελλέα. τὰ πετρῶδη καὶ αἰγυβότα χωρία φελλέας ἐκάλουν. Osborne, R. *Demos: The Discovery of Classical Attica*; Cambridge University Press: Cambridge, UK, 1985; p. 20. ISBN 0521267765. Krasilnikoff, J.A. Attic φελλεύς. *Some Observations on Marginal Land and Rural Strategies in the Classical Period. ZPE* **2008**, *167*, 37–49.
 31. Aristotle *Hist. Anim.* 579b6 and 606b14 comments on the scarcity of lions in southern Greece, contrary to their presence in Macedonia. Herodotus 7.125 mentions lions attacking the camels crossing Macedonia as part of Xerxes' army. Pausanias 6.5.4-5 on the story of Polydamas killing a wild lion on Mt Olympus. Alexander also hunted lions in Plutarch, *Life of Alexander* 40.3.
 32. Wild boar entering cultivated zones and urban areas in modern Greece has become a problem in the last 10 years or so, after some hunters' associations released a number of wild boars in the wild in order to increase the animal population, which would then be suitable for hunting. The change of climate towards milder winters, as well as the abandonment of agricultural land due to shortage of labour and the minimizing of profit, has contributed to a proliferation of the number of wild boars that roam the countryside. See Πώς αυξήθηκαν τα αγριογούρουνα στην Πελοπόννησο. Available online: Tinyurl.com/ya3z98x3 (accessed on 22 June 2018). Αγέλη με αγριογούρουνα στην Εκάλη. Available online: www.newsbeast.gr/greece/arthro/3624278/ageli-me-agriogourouna-stin-ekali (accessed on 22 June 2018).

33. Xen. *Cyn.* 5.18: ἄηλοι δέ, ὅταν κατὰ τοὺς λίθους, τὰ ὄρη, τὰ φελλία, τὰ δασέα ἀποχωρῶσι, διὰ τὴν ὁμόχρῳαιαν. [Hares are] invisible, though, when they run off among rocks, on mountains, stony ground, in thick undergrowth, because their colour camouflages them. Arrian *Cyn.* 17.4: καὶ αἱ δυσχωρίαὶ δὲ πρὸς τοῦ λαγῶ μᾶλλον τί εἰσιν ἢ τῆς κυνός, οἷα τὰ τραχέα καὶ οἱ φελλεῶνες καὶ τὰ σιμὰ καὶ τὰ ἀνώμαλα, ὅτι κοῦφός τέ ἐστιν καὶ οἱ πόδες αὐτῶ ὑπὸ δασύτητος οὐ ῥήγνυνται ἐν τοῖς τραχέσιν. And difficult ground favours the hare more than the hound, where it is rough and stony, uphill and uneven, because she is light and her feet being hairy are not torn on rough surfaces. (translations by A.A. Phillips and M.M. Willcock).
34. Alciphron *Letters* 2.27: Ἀμπελίῳν Εὐέργῳ. Πολὺς ὁ χειμῶν τὸ τῆτες καὶ οὐδενὶ ἐξιτητόν. πάντα γὰρ ἢ χιῶν κατέλιφε, καὶ λευκανθίζουσιν οὐχ οἱ λόφοι μόνον ἀλλὰ καὶ τὰ κοῖλα τῆς γῆς, ἀπορία δὲ ἔργων, ἀργὸν δὲ καθίλειν ὄνειδος. προκίψας δῆτα τῆς καλύβης οὐκ ἔφθην παρανοίξας τὸ θύριον καὶ ὁρῶ σὺν τῶ νιφετῶ δῆμον ὅλον ὀρνέων φερόμενον, καὶ κοψίχους καὶ κίχλας. εὐθέως οὖν ἀπὸ τῆς λεκάνης ἀνασπᾶσας ἰξὸν ἐπαλείφω τῶν ἀχράδων τοὺς κλάδους, καὶ ὅσον οὕτω τὸ νέφος ἐπέστη τῶν στρουθίων καὶ πᾶσαι ἐκ τῶν ὀροδάμνων ἐκρέμαντο, θέαμα ἦδύ, πτερῶν ἐχόμεναι καὶ κεφαλῆς καὶ ποδῶν εἰλημέναι. ἐκ τούτων λάχος σοι τὰς πίονας καὶ εὐσάρκους ἀπέσταλκα πέντε καὶ εἴκοσι. κοινωνεῖν γὰρ ἀγαθὸν τοῖς ἀγαθοῖς, φθονοῦσι δὲ οἱ πονηροὶ τῶν γειτόνων. Ampelion to Euergos: The winter is severe this year, and nobody can walk abroad. For everything is wrapped in snow; and not only the hills but also the valleys blossom with white. There is no work that can be done, and yet it is a shame to sit idle. Well, I peeped out from my cabin, and I had hardly opened my door a crack when I saw along with the snow a whole tribe of birds soaring aloft, both blackbirds and thrushes. So at once I dipped birdlime from the pot and smeared the wild pear branches; and almost before the cloud of birds settled, there they were all hanging from the boughs—A lovely spectacle—Adhering by their wings, and caught head and foot. Five-and-twenty of them I have sent to you as your share, the fat and well-fleshed birds; for it's good for good neighbours to share their possessions, though bad neighbours begrudge them (translation by A. Rogers Benner and F.H. Fobes).
35. Vendries, C. *L' auceps, les gluaux et l'appeau. À propos de la ruse et de l'habileté du chasseur d'oiseaux. In Chasses Antiques: Pratiques et Représentations dans le Monde Gréco-Romain, IIIe Siècle av.–IVe Siècle Apr. J.-C.;* Trinquier, J., Vendries, C., Eds.; Presses Universitaires de Rennes: Rennes, France, 2009; p. 123. ISBN 9782753708354.
36. Many references in Old Comedy, such as Aristophanes *Acharnians* 1116-7, *Clouds* 339, *Peace* 1149, 1195, Telecleides *Amphictyons* F1 (K-A) quoted in Athenaeus 6.268b-c. Geoffrey Arnott, W. *Birds in the Ancient World from A to Z*; Routledge: London, UK, 2007; pp. 94–95. ISBN 9780415540889.
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39. The main evidence is Aristophanes' *Birds* 13–14 with Dunbar, N. *Aristophanes Birds*; Oxford University Press: Oxford, UK, 1995; p. 139. ISBN 9780198150831.
40. Wycherley, R.E. *The Athenian Agora III. Literary and Epigraphical Testimonia*; American School of Classical Studies at Athens: Princeton, NJ, USA, 1957., for the evidence of a bird market in the Athenian agora. Aristophanes *Birds* 529–531 also alludes to the selling of birds in the agora (but the passage has also erotic connotations). Nicarchus' epigram in the Palatine Anthology refers to ten thrushes being sold for a drachma (*Pal. Anth.* 11.96).

41. For a full discussion see Chandezon, C. Le gibier dans le monde grec. Rôles alimentaire, économique et social. In *Chasses antiques: Pratiques et Représentations Dans le Monde Gréco-Romain, IIIe Siècle av.–IVe Siècle apr. J.-C.*; Trinquier, J., Vendries, C., Eds.; Presses Universitaires de Rennes: Rennes, France, 2009; pp. 85–95. ISBN 9782753708354. Lewis, D.M. Commodities in Classical Athens: The Evidence of Old Comedy. In *The Ancient Greek Economy. Markets, Households, and City-States*; Harris, E.M., Lewis, D.M., Woolmer, M., Eds.; Cambridge University Press: Cambridge, UK, 2016; pp. 381–398. ISBN 9781107035881. Chandezon, C. Animals, Meat and Alimentary By-products: Patterns of Production and Consumption. In *A Companion to Food in the Ancient World*; Wilkins, J., Nadeau, R., Eds.; Wiley Blackwell: Oxford, UK, 2015; pp. 135–146. ISBN 9781405179409.



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Article

'Un-Central' Landscapes of NE-Africa and W-Asia—Landscape Archaeology as a Tool for Socio-Economic History in Arid Landscapes

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Abstract: Arid regions in the Old World Dry Belt are assumed to be marginal regions, not only in ecological terms, but also economically and socially. Such views in geography, archaeology, and sociology are—despite the real limits of living in arid landscapes—partly influenced by derivatives of Central Place Theory as developed for European medieval city-based economies. For other historical time periods and regions, this narrative inhibited socio-economic research with data-based and non-biased approaches. This paper aims, in two arid Graeco-Roman landscapes, to show how far approaches from landscape archaeology and social network analysis combined with the “small world phenomenon” can help to overcome a dichotomic view on core places and their areas, and understand settlement patterns and economic practices in a nuanced way. With Hauran in Southern Syria and Marmarica in NW-Egypt, I revise the concept of marginality, and look for qualitatively and spatially defined relationships between settlements, for both resource management and social organization. This ‘un-central’ perspective on arid landscapes provides insights on how arid regions functioned economically and socially due to a particular spatial concept and connection with their (scarce) resources, mainly water.

Keywords: aridity; marginality; landscape archaeology; Marmarica (NW-Egypt); Hauran (Syria/Jordan); Graeco-Roman period; spatial scales in networks; network relationship qualities; interaction; resource management

1. Landscape Archaeology and Central Place Theory

Central place theory (CPT)—developed by Christaller 1933 [1]—revolves around human agents, settlements, and economies. It is about location, connections, and hierarchies. Apart from many useful applications of this theory as a model for explaining and generalizing patterns of settlements, centralized services, and flows of goods [2], the main point of criticism is the particularity of the historical situation from which it was developed: European medieval cities as centers of production and consumption, trading systems and territories. Central place theory has been and can be adapted to areas and historical settings other than medieval Europe [3], since its evaluations are based mainly on economical parameters. However, with this rather limited spectrum of parameters, it dominated the historical-archaeological thinking of European and American academia for a long time. As such, CPT was applied to modern regions and economies [4,5] as well as to many places and regions of Classical Mediterranean antiquity, perceived as times and regions where social and economic life was organized by and in cities [6,7]. Cities are a major feature of social and spatial organization in Mediterranean archaeology. Yet, cities are often still a major focus of research due to the density and concentration of material evidence, which is the ease of access to archaeological and textual sources focused on one topographical spot. For these reasons, CPT has been a long-serving guideline in archaeology.

CPT was developed from and has been applied to agriculturally exploited regions with cities being complex places where people lived. Recent adaptations of CPT start from this fact and question the concept of territory, the definition of city, or the dichotomy of center and periphery [8,9]. Terms like 'central' and 'centrality' can only be applied if a hierarchical organization of society and hierarchical distribution of power and resources can be claimed. Whether something is central depends first on the point of view and then on the spatial scale of the research [9]. When studying past societies, where archaeologists and historians use material and/or textual sources, the resolution of the extant source material for the analysis (a route network, a product or commodities, names, or descriptions in texts) determines the resulting centrality. Centrality is thus a relative term.

With the rise of landscape archaeology in the 1970s [10–12], a shift in how to relate settlement patterns, material culture, and landscapes occurred. Landscapes started to be perceived as large-scale places in which spatial practices and networks are at work, as is also the case in urban environments [13]. Landscapes can be understood as a palimpsest of history, human agents, economy, technology, culture, memory, and almost all human expressions [14,15]. Landscape archaeology, at its core, is area-oriented and not site-oriented, but note the significance of 'places' for agents' practices in and with landscapes [16,17] [18] (p. 44). What might appear as a central place, a settlement, facility, city, source, or the like, is not investigated first, nor is it analyzed in the larger context of socio-spatial practices preserved in the landscape. An advantage lies in the fact that more find spots are integrated into a socio-economic and socio-religious history, and different findings are used and analyzed at the same heuristic level. In practical landscape-archaeological work, off-site findings are considered, but off-site still implies a site from which the off-site is distant. Here again we risk applying hierarchical order to the analytical process. As is the case for central places, we should look for a more balanced terminology for not repeating pre-determined categorizations that can bias our interpretations [19] (pp. 5–8 for criticism).

This view on landscapes opens new processes for considering parameters, like interaction and relationships, to better understand inter-human interaction, economic systems, trade relationships, habitational traditions, or centers. The combination of the approaches of central place theory and landscape archaeology is then a promising method for examining the past in a dynamic and not a hierarchical mode, which is still common in European academia even after the attainment of post-colonialism.

Against this theoretical and methodological backdrop, I present two case studies that may demonstrate the efficacy of the combination of landscape archaeological approaches reflecting on centrality. The paper is based on a comparison of datasets from two ancient arid regions: the Hauran in Southern Syria and Northern Jordan, and the Eastern Marmarica in NW-Egypt in Graeco-Roman times (second and first century BCE to third and fourth century CE), which I compiled and studied in completely differing research contexts and with differing approaches. I analyzed how centrality thinking and how teleological interests in being at the center (or being close to the center) influenced our historical reasoning. By describing the phenomena of the two areas, I lay the background for the approach and analyze the results from an 'un-central' viewpoint on landscapes.

With help from network analysis, landscape archaeology and a revised CPT were successfully combined. Degrees of connectedness; parameters for centrality; and the soft (assumedly subjective) factors influencing how and in what respect to a place, a region, or landscape is important reflect the ongoing difficulties of humanities in working with hard (assumedly objective) and soft (assumedly subjective) factors contemporaneously, contrary to the natural sciences [20–22] (the latter two chose an agent-based approach). Recent studies on emotional decision-making in the economy [23,24] show the human influence on every realm of economic, financial, and (also in modern times) medical interactions. It is not only a matter of ideology and power relationships, but also about barely measurable advantages or influences on how people behave, identify, or react (for ancient economic systems [25,26]).

2. Thinking ‘Un-Centrally’—Where to Start and What to Ask

The two case studies, I offer options for rethinking whether centrality has automatically indicated powerful and dominant. The Eastern Marmarica, on the fringes of the Libyan Desert, as well as the Hauran west of the Arabian Desert (Figure 1) are arid landscapes in the Old World Dry Belt, and only partly suitable for agriculture. Hence, the land was not only in ecologically but also socio-economically marginal. To choose marginal, arid areas for questioning the focus on central places in archaeology and other disciplines shifts our focus to the assumedly non-important and non-central. The outcome of this shifted focus may explain the significance of thinking ‘un-centrally’.

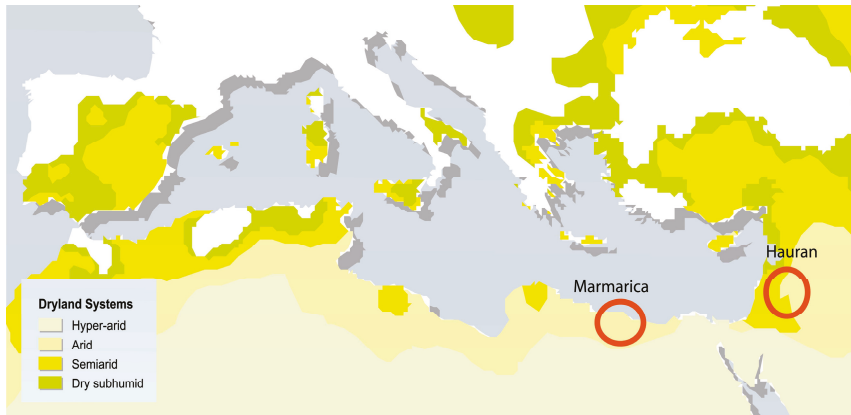


Figure 1. The Mediterranean and the MENA-region (Middle East and Northern Africa) showing the grades of aridity. The red circles mark the areas of the two case studies: the Marmarica in NW-Egypt (left circle), the Hauran in Southern Syria/Northern Jordan (right circle). Both are semi-arid to arid landscapes. Base map: [27] (p. 23).

The data for the Eastern Marmarica (Section 5.2) are the product of landscape-archaeological fieldwork, where the main focus was on the interaction of mobile and sedentary life-strategies, which are dependent on water availability. Since only few textual sources refer chiefly to the region, the main hermeneutical methods were archaeological, geodetic, and geo-hydrological surveys. The chronology was established through pottery analogies of the local production; the results for the ancient water management were based on an integrated analysis the relief, the soil, and calculations.

The study on Hauran (Section 5.1) was developed as part of the framework of a project on the history and archaeology of religion (see Acknowledgements) that focused on the socio-spatial organization of sacred spaces. The data do not relate to my own fieldwork but to published data from French and German projects on the Graeco-Roman phase. Here, the analysis of water is the connecting link to understanding not only individual places, but also their position in making the region function through the water distribution. Hence, accounting for the water scarcity in the two arid regions allowed for the recognition of the logic of their socio-economic organization.

Un-central thinking can be applied to various socio-spatial organizations, such as ecologically extreme habitats like mountain areas, rural areas, or egalitarian groups. In my case studies, the ecological extreme of aridity is the common strand.

Aridity can be defined as follows:

- Resources: limited availability of the resource water and soil
- Climate: high temperatures with high day-night variability, high evaporation rates
- Vegetation: steppe to concentrated to no vegetation

- Population: sparsely populated areas
- Economy: limited economical potential

As a result, the life strategies of the inhabitants of arid regions revolves around social (and religious) organization and institutions, revolving around resource management and a combination of different lifestyles.

Marginality is not only used for ecological phenomena but also as a descriptive term for socio-cultural relationships or positions. The issue of marginality is discussed below in more detail. For an initial overview, the following points characterize marginality:

- Resources: limited availability of or access to resources
- Life strategies: spatial and habitational (for humans social) and temporal niches
- Population: little access and/or participation in larger networks, political power, and cultural institutions
- Economy: limited economical potential

Since centrality, as developed by Christaller [1], starts from economic potential, reviewing it in the scope of this special issue on “un-central landscapes” starts from zones that are not normally regarded as economically powerful, that is, ecologically and economically marginal. Thinking un-centrally embraces a methodology that does not focus on the site or the place, but on the area, the spaces, and—in particular—the relationships, connections, and mutual relationships into which people, objects, and natural phenomena are embedded. Un-central thinking that is influenced by network analysis and actor-network-theory, however, also remains close to the problem of concentration in the network analysis on hubs and nodes (see below). However, the socio-spatial patterns and socio-economic patterns of past groups and societies are better elucidated if we apply a less site-oriented view. Thinking of relationships is also part of central place theory: routes, connections, contacts, and exchanges are thematized in the parameters of how to define centrality (see the prudently developed enhancement of CPT [28,29]). The problem partly originates from the fact that central place theory is a city-based theory as are many socio-spatial studies and researchers [30] base their arguments on urban contexts. What is not considered are the qualities and intensity of relationships, which also implies a temporally different intensity or existence of relationships. The same is true for the various centralities as defined in network analysis: degree and betweenness centrality do not specify all qualities of the centrality. Degree centrality depicts the number of neighbors and links that a certain point or node has to them; betweenness centrality shows those important points or nodes through which shortest routes pass. Yet, the definition of central is defined by presumptions (‘neighbor’ or ‘short’) that do not reflect all the possibilities of human perception, experience, and decision-making.

Too often interpretations of the relationships between objects, environment, and people, which we assume to see in the archaeological record, fall short, since, in the wake of the teleological construction of history and the progressive development of mankind and history, we tend to look for hierarchical relationships. Too rarely do we consider correlations that are the basis for the relationships, qualities, intensities, and their changes [28,30]. To set out my agenda briefly, I: (1) differentiate the view that un-central and marginal places and areas are generally equated with the non-powerful and low economic potential; (2) offer an example in how the close look at the dependencies and relationships of landscapes and people revises the view on marginal areas and places; and (3) deduce my conclusions from the social, religious, and economic practice of resource management, in my cases, of water management

3. Marginality Reconsidered

3.1. Marginality—A Concept to be Differentiated

Marginality can be treated as a social or physical-geographical phenomenon. Social marginality or marginalization means that groups or individuals can be excluded from access to political power, cultural or economic resources, or housing, etc. [31] (p. 7). With the last example, housing, a spatial

parameter is influential: spatial or geographical marginality is, in many cases, related to social marginality (or vice versa) [32]. Research in human geography bridges the gap between social and spatial marginality [33] (p. 90) [34,35]. However, most studies start by looking at urban contexts, including cities or urbanized areas. Even more specifically, they are interested in modern cities and economic systems. Agricultural areas and regions that are not structured by cities and other focal places were not and are not the focus of research [35,36]. This is true also for Graeco-Roman antiquity. Marginal societal groups came to the fore in studies on children, women, slaves, or marginal professions. Spatial aspects of marginality are not an issue in research on ancient Mediterranean societies and their habitats. The importance and value of marginal habitats, spaces, and socio-economic practices for a historical understanding are rather accounted for in Pre- and Early History [28] (p. 2) [37,38].

Another constraint is the criteria for socio-political, economic, and ecological marginality not being mutually exclusive, as Young and Simmonds [38] already criticized. One criterion can be at work, yet the others do not have to be applicable. Moreover, the dichotomic view—paralleled with center and periphery—preconditions hierarchical orders and has been proven to be too simplistic and static. This is also true for the predominant narratives about people at the margins as being disadvantaged and backward, living with an assumed permanent experience of being marginalized. These might be (or have been) often close to reality. However, differentiations and non-dichotomic, non-biased analyses can help with comprehending the social, economic, and spatial practices of different and multifarious past and modern societies or groups.

The geographical and ecological marginality of past societies and regions received more attention in the wake of landscape archaeology [39,40]. A recent study [37] provides a comprehensive overview on the problematic definitions of marginality but proposes overly rigid scales for measuring the marginality of regions or habitats in the four main fields of social, ecological, economic, and spatial marginality. Firstly, scales of measurement as such are difficult to apply to a factor like ‘social marginality’. How can we measure the intensity and impact of social marginality? Is it an emic or an etic view we apply? Secondly, the normal lack of information in archaeologically studied societies and groups leads to sets of non-comparable data [37] (e.g., Figure 3). Knitter and Nakoinz [28] generally pursued a convincing approach. Yet, they measured “spheres of influence” of certain aspects of a center (administration, trade, craft, etc.) in spatial distances to measure the “intensity-level of centrality” [28] (p. 5, and e.g., Figure 4). Even though the addressing of socio-cultural phenomena, like trade, by mathematically based least-cost-paths or the computer-aided reconstruction of networks by degrees and categories of calculable degrees and qualities of centralities is a method for understanding the past, their risk lies in the rigidity of the formulae.

The areas of socio-economic and socio-spatial practices have to be described when we study marginal areas or groups in archaeology. However, the focus should lie on the interdependencies and the relationships, and their various intensities or temporal actualizations. How dispersed or concentrated, how remote or close the settlements, supply areas, routes, or persons are already biased descriptions: distance or closeness, or accessibility or means of communication are socially constructed practices. Whether one is economically successful or fails is also dependent on viewpoint. Whether the concentration of functions, services, and facilities in a center is perceived by everyone as such or is permanently virulent depends on the standpoint of the visitor, inhabitant, or other agents.

Hence, only adapted approaches on marginality and centrality provide the “relative concentration of interaction” [28] (p. 4; with a feasible differentiation between “centrality potential” and “actual centrality”), where marginality can be conceptualized as the “relative absence of interaction”. The case studies below demonstrate on a certain spatial scale how land-use and habitational patterns in ecologically marginal regions can be conceptualized differently when seen through the lens of interaction, and how marginality applies only to limited areas in the lives of the population.

3.2. Weak and Strong Ties and the Study of Marginal Areas

In searching for interactions, relationships, and connections, historians and archaeologists use approaches from network analysis [41,42]. The much more dynamic picture derived from network graphs than from nested geometric graphs of CPT accounts for the more dynamic view of inter-human-landscape interactions [37,43,44], upon which landscape archaeology is mainly concentrated. The less hierarchical view practiced in network analysis focuses on the interdependencies instead of monodirectional pathways. However, when archaeologists and historians study landscapes, trade connections, settlements, and land use as patterns, as well as the distribution patterns of objects, they tend to investigate the nodes and hubs in the network instead of the edges [44]. They do not consider the factors, phenomena, or impacts by which the edges are, or can be, formed and influenced [45,46] (p. 170 with n. 5, for scaled approaches). Is it a physically existing road that connects people and places or is it rather the people using this road, that we look at as edges? In the latter case, the edge is human and mobile and not a physically traceable track. What objects traveled and what ideas traveled with it [47]? What if the connection is only mental, for example to a goddess or to a notion, as I will describe in the case of water and religious institutions?

Hence, all triangulations, cost-path calculations, and categorizations of centrality or marginality, of betweenness or degree centrality, depend on (assumedly) soft factors. This does not mean that the concepts are not useful and actually often lead to intriguing results [28,42,43]. However, history, archaeology, and social sciences revolve around human beings and their position and role in the world, with all human constitutions and conditions. These gaps between (assumedly) hard and soft factors have to be conceptualized and bridged by methodologies including the (assumedly) soft factors. The laws of diffusions and rules for concentrations of objects, people, and ideas, as well as measures for connections and relationships between them at certain spots or in certain areas, are subject not only to measurable parameters [45,47]. Here, the differentiation of how marginality can be perceived and the recourse to Granovetter's model of weak and strong ties meet [48,49]. Strong and weak ties introduced to the network analyses enlighten the not-always-straightforward or expected methods of diffusion and concentration. Even though he studied social ties and the diffusion of a certain kind of knowledge (rumors, for example, spreading with people), his findings can be generalized to other realms. He argued convincingly for the emphasis of weak ties as constituting relationships in and among societies or groups. People who are spatially and socially not close to each other are the nodes in a network through which the largest spread or new concentrations of diffused knowledge (or objects persons, ideas) can be reached. Weak ties can bridge large social (or spatial) gaps because they are bridges and not fully-fledged relationships [48] (p. 1364–1366, Figure 2). The value of this shift of perspectives is that the segments and margins of the groups that are emphasized. People at the margins have the position and capacity to connect (distant) groups. It is not the people (and places) well-embedded with many contacts creating networks; it happens through the rather isolated people or hubs. This applies especially to the case study of Marmarica.

Applied to a more spatial approach, the weak and strong ties correspond to bridges, short cuts, or longer and shorter distances, but also to intensity that does not regard distance or closeness. Acknowledging weak and strong ties defines the quality of the relationships, or the randomness of the (social) ties, allowing for the dynamic organization of connections, but also of detachments. The so-called "small-world phenomenon" [50] combines the (social and spatial) distance and the quality of connections, and accounts for either randomness or clusters in networks [36,51] (for an application to the Mediterranean past pp. 27–33).

The un-central, less biased view in combination with the differentiation of the weak and the strong ties help develop a new perspective on marginal areas, as well as marginalized spaces and people. The organization of relationships, as well as the spatial and temporal scale on which the organization is practiced, play a role in the model of weak and strong ties between the agents and define the "small" or "large" worlds. An application to a geographical region and a social organization in a certain period of time leads to new and differing views of settlement patterns and socio-spatial and socio-economic

organization. In the Graeco-Roman Hauran, these were based on strong ties, and led to a rhizomatic network of places and settlements related to each other by water management. In the Graeco-Roman Eastern Marmarica, rather weak ties and bridges were at work and led to a tree-like dependence on settlements and places.

4. Marmarica and Hauran in Graeco-Roman Times: Two Arid Regions—But Are They Marginal Regions?

For easier communication, we work with definitions, terminologies, and categories (arid, marginal, Graeco-Roman, and central). This is the top-down method of communication. However, what difficulties or opportunities do we face when we proceed bottom-up, starting from a physical-geographical, ecological, historical, and archaeological context? With the two regions in the scope of this paper investigated mainly in their Graeco-Roman period, I can exemplify the impact and relevance of soft (assumedly subjective) factors on the definition of marginal or central. The two arid regions act as cases for interpretational openness and methodological accuracy that allow for re-narrating histories, or at least for adding new aspects to these histories [52,53] (p. 85 and 96).

Hauran in Southern Syria/Northern Jordan, and Marmarica in Northwestern Egypt are both arid environments (Figures 1–3). The two regions allow for a vision (Marmarica) and revision (Hauran) of repeated and perpetuated views on desert, steppe, or marginal areas from the viewpoint of the Mediterranean and Graeco-Roman spheres of influence. These views lead to interpretations of socio-cultural settings and phenomena in the sense of provinciality, closeness (loyalty) to, or remoteness from (aversion to) Roman rule [53–56]. Central place theory might be seen as a continuum in such interpretative patterns by (western) archaeologists and historians. However, starting from the region, its historical and ecological conditions and socio-economic organization led to differentiated views. Not focusing on central places, and only sites in the archaeological sense, allows for a more dynamic view of interhuman and human-landscape interaction. The landscape of a region is not limited to the exploitable hinterland. The inhabitants rely on it, as well as they form and are formed, adapt and adapt to the landscape as their place of living, memories, death, and notions of the divine (cf. e.g., [57]).

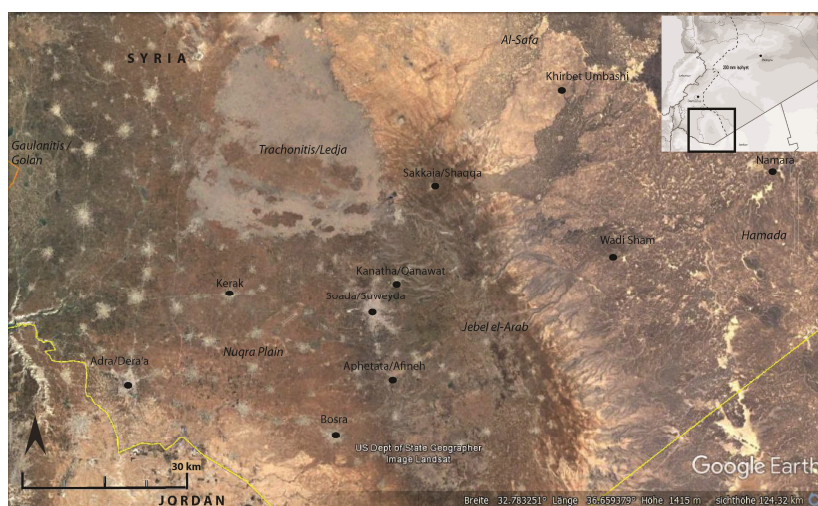


Figure 2. Satellite image of the northern parts of the arid landscape of Hauran (Southern Syria) showing geographical units and settlements referred to in the text. Created with Google Earth V 7.3.2.5495 (Google, Mountain View, CA, USA). Image: Landsat/Copernicus 2016, as base map.

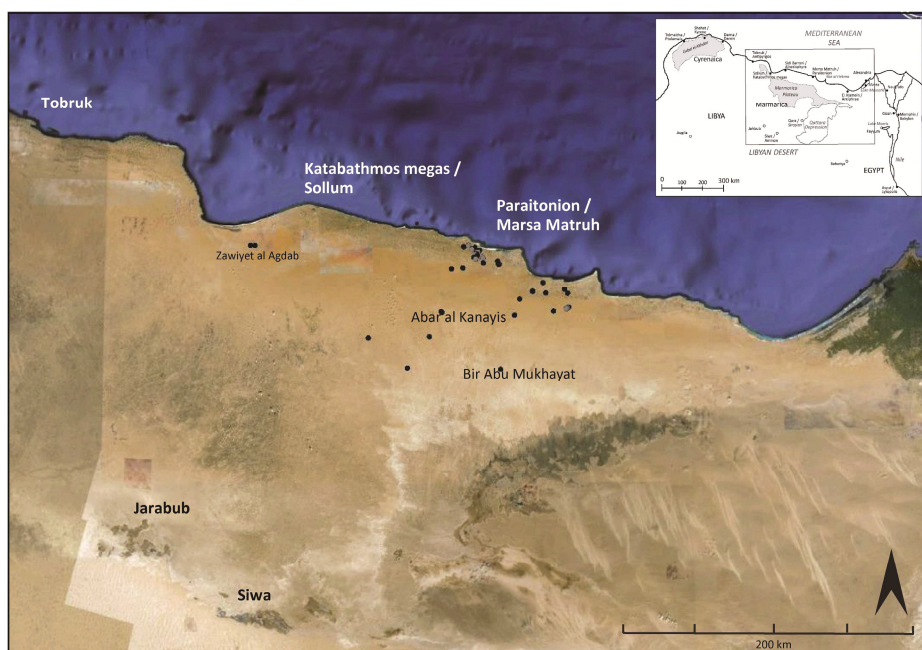


Figure 3. Satellite image of the eastern parts of the arid landscape of the Marmarica showing geographical units and settlements referred to in the text. Created with Google Earth V 7.3.2.5495 (Google, Mountain View, CA, USA). Image: Landsat/Copernicus 2016, as base map.

The Hauran, with its sub-units called Gaulanitis, Hauranitis, Batanea, and Trachonitis in antiquity, is a mainly basaltic region situated in the Yarmuk drainage basin [58] (see their Figure 6), and characterized by variable precipitations where only Jebel el-Arab (1800 m a.s.l.) receives enough rain for rain-fed agriculture (Figure 2) [59,60] ([59], their Figure 1 shows the 250 mm isohyets crossing the region). To the east the Safa and the Hamad, parts of the Arabian Desert adjoin.

The Marmarica is situated on the northern fringes of the Libyan Desert (Sahara), between the Nile Valley and Cyrenaica, as well as between the Mediterranean coast and the Qattara Depression/Siwa Oasis. In the calcareous region, precipitation is insufficient for rain-fed agriculture and steppe vegetation dominates (Figure 3) [61,62].

Water was and is the limiting factor for economic activities. Wide-spanning systems of water provision, water-collection, and water-distribution, typical for arid areas, characterize infrastructure, social institutions, and the economy [61–63]. Given the variable resource availability, livelihoods are based on a mixed system of nomadic and sedentary life strategies. Hence, the varied economic potential of the marginal areas is exploited or utilized: a kind of opportunistic agriculture, combined with livestock breeding, and participation in and organization of long-distance and short-range trade and exchange of goods [62].

The population in Marmarica has lived there since the Late Bronze Age up to present, partly sedentarily, partly nomadically. However, according to the findings, a peak in agricultural production in Graeco-Roman and Byzantine times allowed a surplus economy [64–66]. Hence, one marker for marginality, the economic potential of a region, is affected by human impact. The impact is the extensively mastered and managed water harvesting installations along, and in the wadi as well as on the tableland of the Marmarica Plateau. For a period of ca. 500 years, the area was far from economically marginal.

In Hauran, traces of human presence start in Neolithic times when the region was already as dry as in later times apart from minor shifts (e.g., during the Roman Warm Period) [67–70]. The earliest traces of many settlements date back to the first centuries of the first millennium BCE, during which many underwent a heavy reconstruction and enlargement in Graeco-Roman times. Despite the harsh conditions in the Trachonitis (Leja) or in the areas north and south of Jebel el-Arab, the settlement density was fairly high.

In terms of political and administrative history, the two areas reflect their position on the fringes. In Marmarica, despite the attempts of the Egyptians from the Nile Valley, official Roman rule began in 64 BCE, when it became part of the province of Creta and Cyrenaica. In the eastern parts, this happened earlier: with the defeat of Cleopatra in 31 BCE, the formerly Ptolemaic Eastern Marmarica formally came under Roman administration during a political re-organization of the region rather than during an economic peak [71,72].

In the case of Hauran, the Romans took over rule in 64 BCE in the northwestern part (Syria) and in 106 CE in the southeastern parts (Arabia). Earlier, the Ptolemaic and Seleucid kingdoms influenced the region, which was politically organized into city associations (Dekapolis). The areas of the Gaulanitis (Golan), the Mount Hermon, or the Safa were less urbanized, and for some periods of time, also less controlled [73] (pp. 31–53; 206–239) [74] (pp. 27–126; 412–414; 421–430).

Since both areas are on the fringes of the desert—marginal areas—they were not of much interest for the kingdoms of Ptolemies and Seleucids, since, for them, the regions also lay on their fringes. Indigenous people continued to live as they had before. However, infrastructure and population patterns changed over the decades and centuries, such as, for example, through military activities (at Mount Hermon in Hellenistic times against the Nabateans) [75] (p. 156–161) or the settling of veterans (Marmarica), as well as the need for higher crop yields due to denser populations, or economic demand (pottery production and wine production in Marmarica; grain in Hauran, see below).

As a result of the still-limited economic potential, the population density was and is not very high. Accordingly, the material culture was quantitatively not high and its categories were not multifaceted. This applies mainly to Marmarica, where settlement remains, agricultural installations and pottery constitute the main corpus of find material. Hauran, due to higher water availability, was not as sparsely populated as Marmarica, and materials ranging from inscriptions, sculptures, settlement and public architecture to agricultural installations are present.

5. Looking for Agents and Interactions in the Landscape on a Regional Scale

The review of marginality through the lens of central place theory, of weak and strong ties, and of interaction and relationships, can now be applied to ancient Hauran and Marmarica. The study of marginal areas should start at the local and intra-regional scale, then progress to an inter-regional scale. The Roman Empire, as a homogenizing entity, is only addressed at a higher scalar level.

5.1. Hauran

Hauran offers a test case for rewriting archaeologically-based history from the perspective of un-centrality. Hauran and its archaeological material, as mentioned above, academically faces a paradoxical situation: up to the present-day war in Syria, well-preserved remains of all kinds of settlement and infrastructure, sculpture, and epigraphy were found (Figure 2) (see Freyberger and Ertel [55] for epigraphy, and Meynersen [56] for sculpture). Yet, the history and archaeology of Hauran is often left in its niche of being exceptional. Hauran is often viewed only through the lens of its positions or was ascribed to between the more central powers like the Nabataeans or the Romans. How can we explain the rich corpus of sculpture, and why were they so keen on writing texts? What were people concerned about, and to whom did they feel more related or inclined to exchange with, and to whom less so? More abstractly formulated, what were the social, material, and spatial relationships, and how were objects, landscape, and people interrelated?



Figure 5. Examples of canals or conducts and wadis in Hauran. Canals are ca. 1.5 m wide and 0.5 m deep. **Left:** A wadi west of Soada/Suweida filled with water after rainfall. ©Hayan Hmidan, cc-by-2.0 [79]. **Right:** Canal of Kharsa/Salakhed (east of Bostra). [59] (Figure 16).

I show these relationships with the example of Seeia and Kanatha (Figures 2 and 4, labeled as Qanawat and Si', respectively) [74] (pp. 393–396)]. According to the remains and sources, the two apparently have connections to other places via water distribution. This demonstrates how these relationships created a system of partners rather than hierarchies: Seeia, as a sanctuary and settlement on a spur in the Jebel (1300 m a.s.l.), from the first century BCE, received water from the Jebel and stored it in cisterns [78] (esp. Figure 4) [80–82]. Also, a water distribution facility was located in front of the sanctuary. Many underground channels can be traced between Seeia and Kanatha, two kilometers to the north, leading to reservoirs and cisterns in Kanatha [83]. Kanatha had features of a city—a city wall, various temple buildings, a theater and a nymphaeum—that corresponded with its 'upgrading' to the status of a *polis* in the second century CE. In particular, one of its sanctuaries was prepared for storing huge amounts of water (Figure 6) [78] (see Figure 4). The temple of Zeus Megistos overlooked the large sacred area at the highest point of the city [82] (see reconstruction Taf. 85, Beil. 8).



Figure 6. Cistern in front of the temple of Zeus Megistos at Kanatha. ©James Gordon, cc-by-2.0 [84].

Seeia is normally treated as an important sanctuary and meeting place, and due to its vicinity to Kanatha, is considered to be dependent on that city. In terms of the water management system, the situation is reversed (or at least more balanced): Kanatha has no water without Seeia. Yet, the dependencies also extend to other spatial scales. At Kerak, some 20 km west of Kanatha, the inhabitants worshipped the god Zeus. However, this was not the Zeus of their village and community, but the *Zeus Megistos Kanathetôn*, precisely of the people of Kanatha (Figure 7) [85] (no. 9810. 9799). The inscriptions can be roughly dated to the Roman period (second or third century CE); however, the temple of Zeus at Kanatha from the third century CE presumably had a predecessor dating to the first century BC/first century CE ([54], ch. 3.4.7 and 3.4.8) Here, the dependency appears even stronger than that between the settlement and the communities of Seeia and Kanatha (Figure 8).

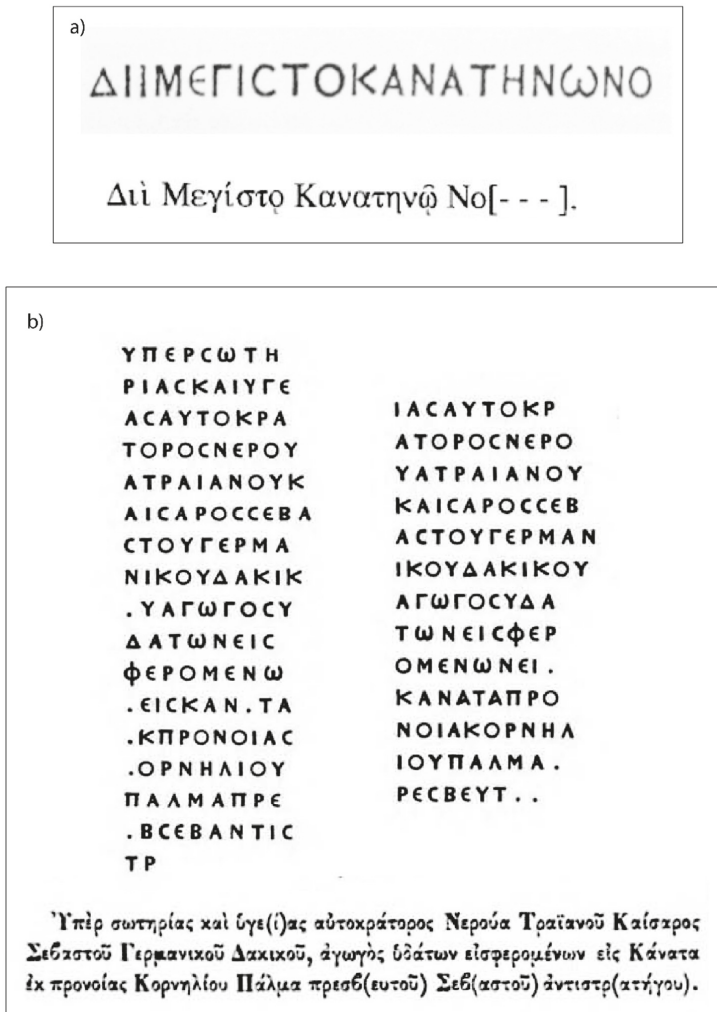


Figure 7. Inscriptions pointing to bi-directional relationships between the settlements. (a) The people from Kerak in the plain of Nuqra worship Zeus Megistos at Kanatha, located 20 km to the east of Kanatha, from where it received water. [86] (no. 2412d), [85] (no. 9799). (b) Inscription from Aphetata/el-Afineh about the channels of water (*agogoi hydatôn*) from Kanatha. [86] (no. 2296. 2297).

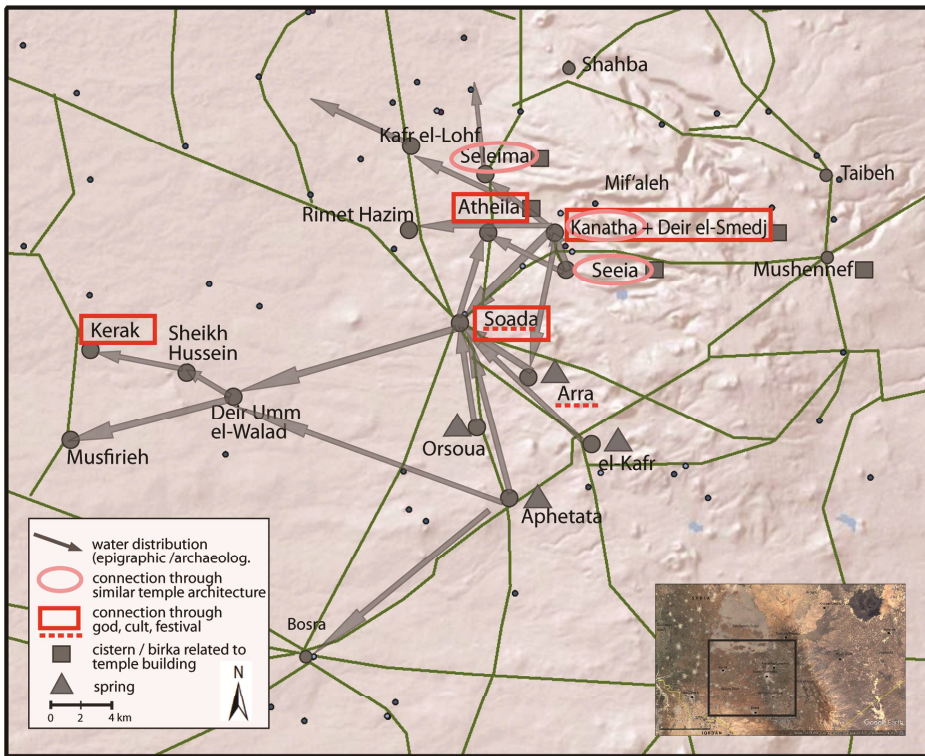


Figure 8. The relationships between landscape, resource, settlements, and people created through water management (mono-directional) and religious institutions (bi-directional) in the western slopes of Jebel el-Arab and the plain of Nuqrah. Map: A.-K. Rieger.

The settlement of Soada to the west of Jebel el-Arab is an example of a central place in the region due to various functions, with city status from the mid-second century CE onward, and its urban features (nymphaeum, colonnaded roads, and theater) [87]. Some villages to the west received water from Soada (and through Soada from Kanatha): Museifireh, Deir Umm Walad, Sheik Hussein, and Kerak [86] (no. 9810. 9811. 9815. 9817). However, Soada itself depends heavily on the water resources from Jebel. It is a recipient, which is a weak position. First of all, Kanatha, but also other places to the south—Arra, Aphetata, and Orsoua—send water to Soada [85] (no. 2296. 2297. 2308) (Figure 9). To be on good terms with those settlements and communities that were important to Soada, the citizens or city council of Soada sponsored a temple and a statue of Athena at Arra [85] (no. 2308) (Figure 9). The relationship of the people of Soada to those of Kanatha was re-instantiated every year in a common festival. At Deir el-Smedj on the outskirts of Kanatha lies a huge temenos where an inscription was found, telling us that the people of Soada financed a communal festival [85] (no. 2374a; [88] (no. 144. 171). The cases from Kanatha, Soada, Kerak, and Arra show that the water distribution system and the guarantee of water availability functioned as a reciprocal system. Deities as transcendent protectors (Zeus and Athena) were called upon to supervise the organization and management. At the settlement of Aphetata, one of those directing water to Soada, various lines of water supply are connected. The source at Kôm Nebe Ira (Figure 4) was most likely tapped for water for the area of Soada. Other sources in the area of Aphetata (e.g., Nimreh Qraye) presumably fed the aqueduct running southwest to Bosra [60] (p. 103, 134–135) and [78]. Based on the elevation of Aphetata,

at 1100 m a.s.l., is one of the lowest points sending water to Soada, and the watersheds between the individual wadi catchments are the interface between the northern and southern catchments (Figure 8).

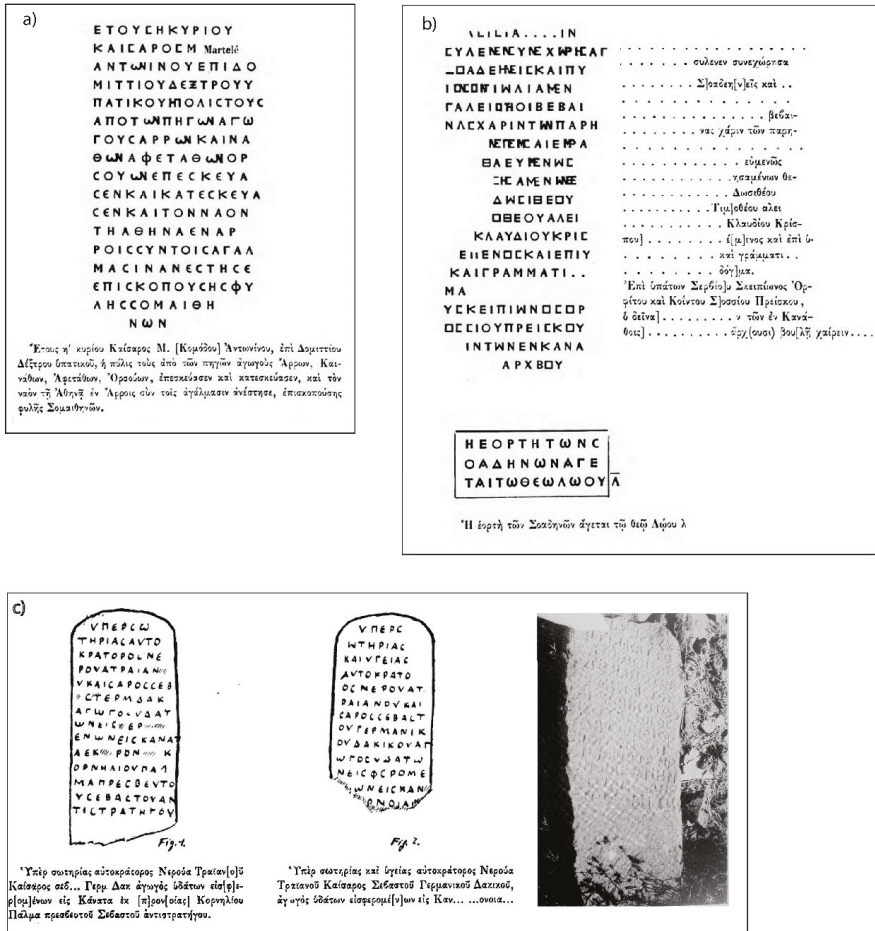


Figure 9. Inscriptions pointing to bi-directional relationships between the settlements. (a) Inscription from Soada about the renovation of water channels (*agogoι*) from Arra, Aphetata, and Orsua, and the construction of a temple and a statue of Athena by the *demos* of Soada at Arra. [85] (no. 2308). (b) Inscriptions on stelai from Soada (left) and el-Arra (center) and the stela from Zawiyet Balahat, speaking about the water that was directed from Kanatha to Soada. [89] (Figure 1. 2). (c) Inscriptions from Soada (left) and Dmeir el-Smedj (right) about a feast at Dmeir el-Smedj involving both communities. [85] (no. 2307. 2370).

For the provincial capital and the city of Bostra, we do not have evidence of relationships with other places that were established and confirmed by religious institutions. However, the water on which Bostra relied, with its baths, nymphaea, and a considerable population, originated from the Jebel to the northeast [87,90,91]. To determine the centrality depends on the degree of independence a place has. The capital is not independent from this huge area on the slopes of Jebel el-Arab, with its sources, settlements, and communities, where traces of a dominant administrative control cannot be found (Figure 8). Moreover, the Roman provincial border between Syria and Arabia runs across these

watersheds and drainage systems that supplied Bostra. Juridical implications and dependencies came certainly along with this territorial particularity.

Resulting from the perspective on relationships through water management and religion is the concept of central places and spaces they controlled is not applicable to Hauran. Even though the settlements are nuclei of housing, religious institutions, administrative, and economic infrastructure (reservoirs, roads, markets, meeting places, even baths, etc.), they cannot be considered as independently acting. The imagery of a rhizomatic system, in the sense of Deleuze and Guattari, is more suitable for understanding the place-space-resource relationships at work in Graeco-Roman Hauran [92]. The French philosophers used the image of a rhizomatic, web-like root system from botany for describing and organizing the phenomenology of the world in contrast to the (structuralist) tree-like organization. The various individual settlements appear on the surface, but exist only due to their rhizomatic entanglement with the other settlements and sources. The relationship is not mono-directional, since water is directed down the slopes, but people were connected up the slopes by religious practices. To concentrate on one central place is not warranted. All places partaking in the described network were more or less central according to the various parameters of vicinity to water, vicinity to encampments, exchange with nomadically living groups, closeness to routes, and the number of inhabitants and facilities. However, there was no center of this kind that could have existed or survived without the close and re-established contact to the other settlements.

5.2. Marmarica

Marmarica exemplifies, from a different viewpoint, the importance and value of marginal and un-central areas. This arid region, between the Nile Valley and Cyrenaica on the fringes of the Libyan Desert, was underrepresented in research up to the late 20th century CE. Only Siwa in the south and also the northern parts have drawn the attention of travelers, archaeologists, and anthropologists (Figure 3) [93–95]. However, it is not only due to the little interest in the region but also its character that only few find materials and remains are known. People living here from the Bronze Age to Graeco-Roman times followed combined strategies of livestock breeding and agriculture, and were therefore prepared for both drought years and good years. However, landscape archaeological studies, pursuing a spatially large scale and diachronic approach, broadened perspectives to socio-spatial organization, economic surplus production, as well as to intra- and inter-regional connections that helped with understanding how the region functioned in antiquity in a way that was far from ‘marginal’ (Figure 10) [61,63,65,66].

The first issue for human, faunal, or floral life in Marmarica was the scarcity of water and the poor quantity and quality of soils. Apart from the 150 mm annual rainfall in the coastal strip, the entire region has to cope with arid conditions. Rainfall decreases with distance to the coast (Figures 11 and 12). Only with water and soil harvesting measures on the tableland, along and in the wadis incised in the tableland, can the conditions for agriculture be generated (Figure 12). People from the second millennium BCE onward built and amassed embankments, terraces, and dams with the field stones at hand. Soil was accumulated behind terrace walls, dams, or shallow embankments by the flow of water by which it was transported (Figure 13). A peak of managing and harvesting water and agricultural production occurred in the first to the fourth century CE, in Roman times.

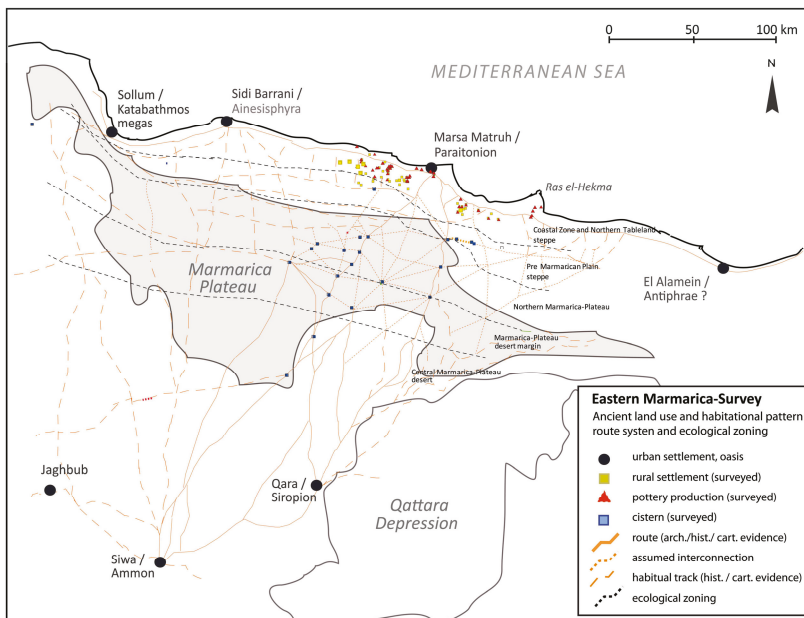


Figure 10. Map of the eastern parts of Marmarica showing habitational and land use patterns, production areas, and the route system in the ecological zoning. (Minor findspots like campsites or fields cannot be displayed on this scale.). Map: A.-K. Rieger, T. Vetter.

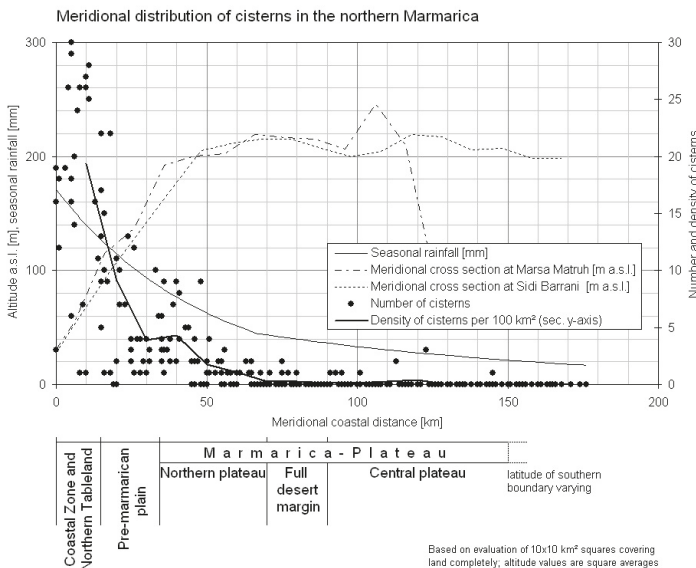


Figure 11. Cistern density in the area between Sidi Barrani/Ainesisphyra and Marsa Matruh/Paraitonion in recent times in correlation to mean rainfall, relief, and coastal distance. A high number of the cisterns on the tableland date back to Roman times, whereas the surveyed cistern sites on the Marmarica Plateau show evidence of older periods. Graph: T. Vetter.

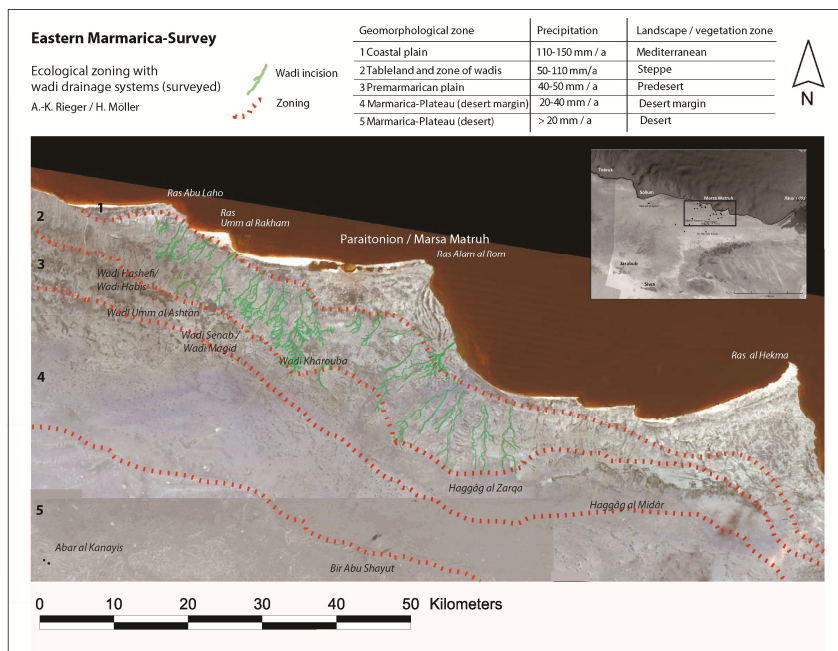


Figure 12. Map of Eastern Marmarica showing the ecological zoning, the wadi drainage systems, and the mean rainfall. Map: H. Möller, A.-K. Rieger based on Landsat 5TM 179–38.

Water from overland runoff from mainly winter precipitation can be stored in the soil. This “harvested” soil and water allows for the growth of crops and trees (Figure 14) [62,63]. All agricultural production is determined by the amount, direction, and velocity of the water. By these means, the cultivable land amounted to no more than 9% of the tableland in Graeco-Roman times (Figure 3). However, fallows or the crops on the fields in drought years could be used as grazing areas, as was the case with the steppe zone south of the tableland. The yields and returns from agricultural production (barley, grapes, figs, and only little wheat) and livestock breeding amounted to a surplus, whereas marginal areas are normally considered to only allow the inhabitants a subsistence economy (Figure 15) [62–65,96]. This surplus production was reconstructed mainly from the existence of numerous pottery production sites along the coast and on the tableland dated to between the second century BCE to the fifth century CE, and from the peak in the number of settlements (Figure 16) [64,65] (p. 144). The production of the potters’ workshops was mainly transport amphorae [97]. These locally-produced amphorae were at least transported to the south, to Siwa, as demonstrated by the findings at water supply points and the route network on the Marmarica Plateau [63,66].



Figure 13. Embankment on the tableland for creating cultivable areas (Hâggag Midâr) (**top**); cross sectional dams in the bed of Wadi Kharouba, section (**middle**); surface view on a dam/terrace in the bed of Wadi Kharouba (**below**). Photographs: A.-K. Rieger.



Figure 14. Wadi bed with fig trees and ponding water behind the terraces after rainfall. Photograph: A. Nicolay.

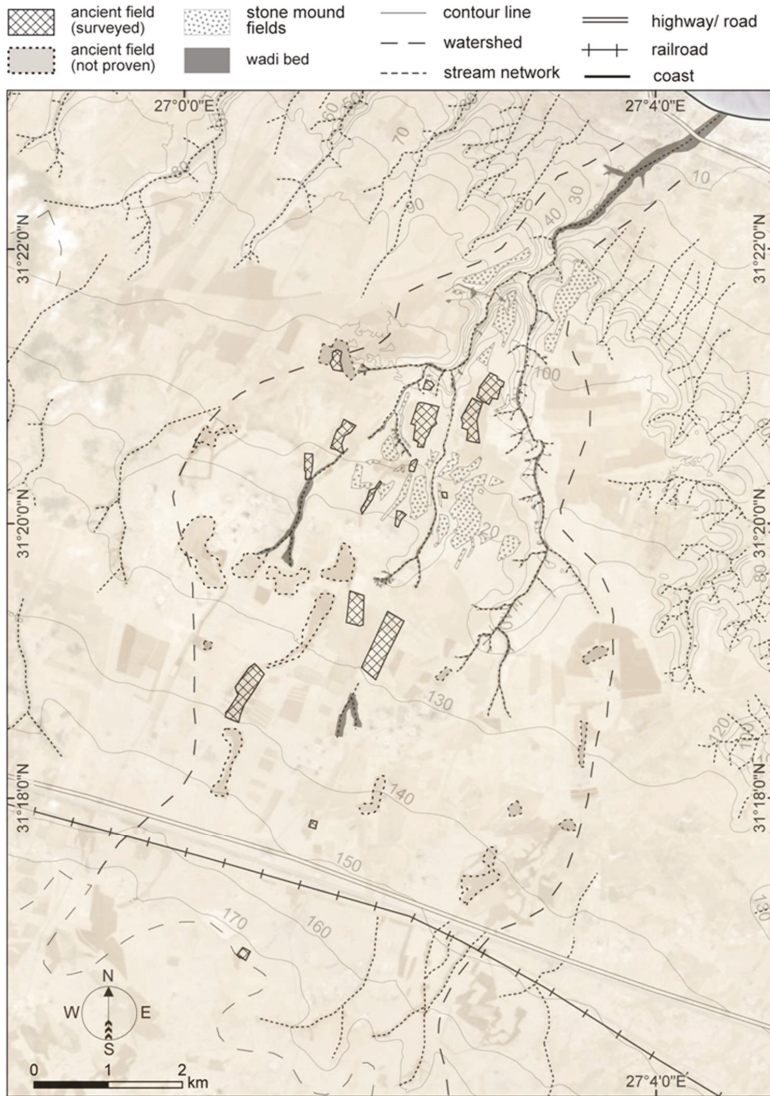


Figure 15. Watershed/drainage system of one wadi (Umm el-Ashdan, cf. Figure 12 for its location west of Marsa Matruh) with the various cultivable areas. Map: A. Nicolay, A.-K. Rieger, T. Vetter.

Resource availability preconditions the economic life strategies and the habitational pattern, which was also true for Graeco-Roman Marmarica. The habitational pattern is structured according to water availability: In the south (Marmarica Plateau), only water supply points (cisterns) and campsites close by or in depressions with some vegetation for grazing occur (e.g., Abar el-Kanayis, Abar Abu Mukhayat) (Figures 10 and 12) [63,65,66,98]. Campsites, fire places, and other human traces between cisterns and depressions have only been rarely traced. The steppe zone (Premarmarican Plain) allowed agricultural use in limited favorable locations, but was sustainable only when combined with livestock breeding. In this zone, campsites, such as those of herders, have also been traced. This trend continues to the north in the zone of the tableland and the wadis where the highest density of settlements

occurred, with different amounts between two to three farmsteads up to 25 to 30 farmsteads with pottery production sites of various sizes [64].

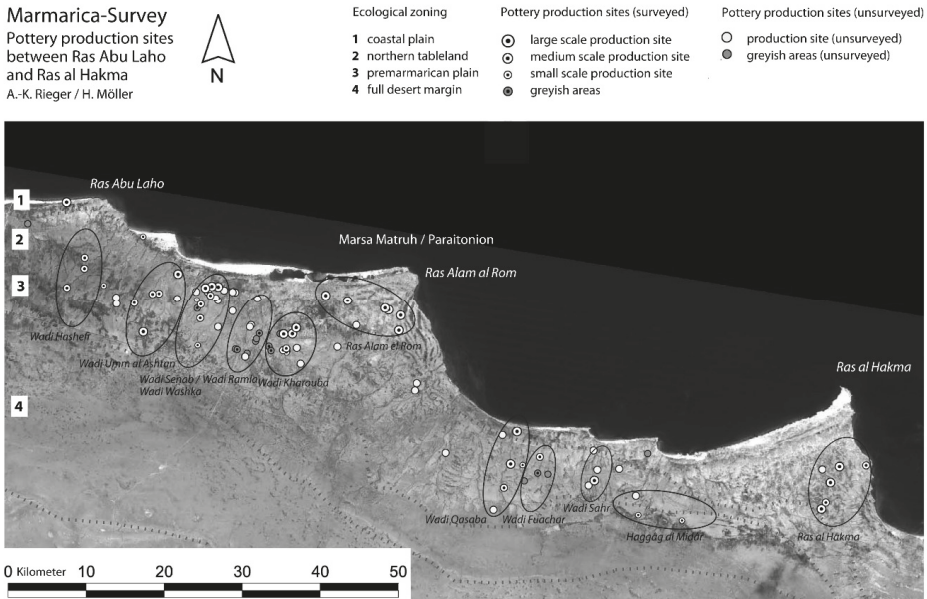


Figure 16. Pottery production sites in Eastern Marmarica. Map: H. Möller; A.-K. Rieger based on Landsat 5TM 179-38.

The course of the water structured the entire region, which had harbors and anchorage points along the coast, and with the city of Paraitonion (modern Marsa Matruh), created an administrative and economic center (Figure 12). However, the coastal strip was only the last link in the flow of the water. Due to the slight but sufficient inclination of the Marmarica Plateau in the south, the runoff reached the catchment areas of the wadis on the tableland. The hydrological regime depended on the water coming from the south [99]. The parallel drainage systems of the wadis themselves, and the settlements along the escarpment, which divides the coastal strip from the tableland, do not depend on each other, even if they are spatially much closer than the plateau in the south. All activities and the associated settlements, water supply points, grazing areas, and production sites depend on the runoff-conditions on the plateau. So, the orientation of those living on the tableland was oriented toward the south, as was the case for those living in the coastal zone. If people on the plateau, the tableland, and along the coast did not join forces and invest labor into a correct water management system in the southern parts, neither could water be harvested nor soil be accumulated to store the water between, along, and in the wadis or in the coastal plain.

Since water management was necessary not only to obtain water, but also to limit it, flood prevention was an issue. Investment in water management was as important for those upstream partners as the water itself was for the downstream partners in the system. Due to the relief of the region, this south–north structuring continued across to the plain along the coast. The people living in the coastal plain—as the final and lowest members in this chain of water—had a strong interest in suitable water management in order to prevent fertile soils from being washed away, but simultaneously maintained high and stable water availability.

Accordingly, the organization of the land and the people living on it was structured by wadis in line with the south–north running water. This means rather independent sub-systems in the

tableland and wadis zone ran south–north (Figure 10). The water management only functioned if all agents in one catchment area along the line of the runoff and along the wadis participated equally. This causal correlation of the upstream and downstream neighbors can be considered evidence for the non-centralized organization of socio-economic life in Eastern Marmarica.

Even if the control of resources promised power—the more one controls, the more one’s power increases—the management of scarce resources led the people in Eastern Marmarica to collaborative rather than centralizing measures. The people along the coast were dependent on the upland management of the water. Comparable collaborative investment was true for oases in the Libyan Desert (e.g., Kharga), which led to a heterarchical system of socio-economic organization, whereas the concentration of power often results in hierarchical systems.

In the case of Eastern Marmarica, one could think of the elite of landowners as known from the Roman landscapes of the Nile Valley or the western North African regions. By analogy, this conclusion does not consider the local conditions. As laid out above, it was rather the collaborative investments and heterarchical organization that allowed people to live in Marmarica in Graeco-Roman times.

The approach of reading the landscape of the Marmarica in an un-central way does not mean that the existence of central places should be denied. There were central places like the Oasis of Siwa and the harbor of Paraitonion, which were places where economic and political powers were (and are) concentrated. Yet, the factor of time should be considered. Temporary central places can be markets according to harvesting periods, pottery production sites according to the demand of storing or trading agricultural goods, the rhythms of caravans, and the need for certain goods (meat or grain) on a regular basis, all of which offer a more dynamic and organic picture of when and how the oases or the harbor cities had a central position and significance.

6. Conclusions

The choice of a marginal landscape characterized by aridity requires a more nuanced and differentiated application of central place theory based on different environmental and cultural settings. The combination of models, such as the small worlds phenomenon and weak and strong ties from network analysis with what socio-spatial practices, such as the land use and habitations that we find in these two ancient arid landscapes, broadens the perspective of arid landscapes and lifestyles of people. Researching the issue of rural water management as a non-static resource has proven to be useful for overcoming overly site-oriented approaches of past societies, which mirrors the often underlying influence of hierarchical thinking as propagated by (traditional) central place theory. Dynamic views, focusing on the interactions and qualities of relationships, which, in the case studies, included the methods of the resource management and involved people, places, and spaces, provide new perspectives beyond the model of central places regarding life strategies, land use patterns, and social organization. Arguing in favor of the non-centrality of landscapes (“un-central landscapes”), or of landscapes as places, we are able to blur the line between the center and the surroundings. Landscape archaeology—among its multi-layered merits—focuses on larger areas and not only on sites. The benefit is that archaeologists can enhance their ability to consider contexts, interrelations, and their complexity. Many conceptualizations of marginality have been derived from the study interest in cities—sites of condensed material evidence, and facilities—wherever and whenever they were located. The marginality approach combined with a more differentiated understanding of central place theory applies more clearly to areas and to networks, and does not define cities as the *non plus ultra* of socio-cultural and economical human activity.

Resulting from the case studies of arid, ecologically marginal landscapes of Graeco-Roman antiquity are the following observations:

1. Un-central \neq unimportant \neq no potential The case studies presented non-central areas when seen from the perspective of the Graeco-Roman Mediterranean. They were/are marginal in the sense that they were characterized by ecological marginality (arid environment) and economic marginality, which is associated with social and political marginality. However, the studies

demonstrate a strong position in a network of relationships, and also an economic potential that was considerable in relation to ecological conditions, and the yielded surpluses.

2. Un-central = not site-oriented, but area-oriented Methodologically, thinking in un-central terms helps viewing historical phases, cultural phenomena, or economic relationships using a non-site-oriented method. Landscape archaeological, area-oriented approaches should be much more relevant in research design to go beyond the fixation on sites. In the case of Hauran, the area- and relationships-oriented approach, as presented here, can better explain the settlement pattern of the region, where research 'sticks' to villages and their temple buildings. In Marmarica, only an area-oriented view provides results due to the large areas with which habitational areas were connected in order to receive water.
3. Un-central = marginal = sensitive and resilient = historically of interest Especially in ecologically (and economically) marginal areas, the sensitivity and can be more pronounced and recognizable than in ecologically well-suited regions. In regions at the margins, inhabitants were used to a fragile balance, to good and bad years, to necessarily adapting to scarce or overly abundant resources. Hence, in the case of Hauran and Marmarica, climatic changes or crises, political developments, and modifications in economic relationships could either have strong and fast effects due to the fragile situation, or could not affect areas and people according to their abilities to more easily and quickly adapt to changing situations. For this reason, the evidence from (arid) marginal regions can reflect larger (global in the sense of the MENA-region) historical developments, which are not easily visible in areas of complex, dense, and politically biased sources. The socio-economic (and socio-religious) history of marginal regions can archaeologically appear in a better resolution of contexts, findings, remains, and soil.
4. Un-central \neq no complex interdependencies (people, resources, spaces) An un-central approach to the study of past societies and economical systems is suitable for gaining insights into the complex interdependencies of people, resources, spaces, and political or natural changes. Investigating marginal areas of Marmarica and Hauran offers insights into the complexity and the connectivity, provided that we accept different ways of living, such as mobile life-strategies, the particularities of communities and individuals involved in trade interactions. These are methodologically difficult to grasp but are not marginal players in marginal regions.
5. Un-central areas = marginal, but from two sides = areas 'in-between' Un-central areas, as presented in the two case studies, are zones in-between politically and economically often more powerful areas. Their role as buffers, areas of contact (trade) but also of conflict (control, war), is of significance for political and economic balance. Both Hauran and Marmarica—though not the main issue in this contribution—played a mediating role in Graeco-Roman history and beyond. Yet, acknowledging the other side of the margin is as enlightening as the area-oriented approach outlined above.
6. Un-central = temporal shifts in degrees of centrality Places can change their centrality in the course of, for example, an agricultural period. Temporal shifts and oscillations should be considered when determining the centrality of places. This methodologically challenging point adds more fluidity to a rather stable concept. The cases of Hauran and Marmarica started from water, which is a fluid and not a regularly available resource. As such, the approach considers the changing status of places and the multiple roles. A place receiving water is also a redistributor (Soada). Political central places like Bostra were highly dependent on a huge area. Which places were more central has to be answered in a differentiated way by investigating their web of relationships. A temporarily changing use and varying degrees of places being frequented, according to economic flows of harvest, or periods of processing goods, and best times for trading goods, can be postulated in Marmarica. Cisterns along routes, potters' workshops, and harbor sites were not continuously central on the respective scale.
7. Un-central areas \neq not deprived of centers The definition of a what is perceived as the center should be clearly explained in every single study, depending on the material categories and

the scales being examined, and should be integrated into an interpretation. The centers in both Marmarica and Hauran are those with a high concentration of functionalities and features, of people and power—even if they were not perceived as such all year round. Yet, their position in the overall socio-economic or socio-religious organization varied.

From the different quality or intensity of relationships represented by material remains in the two ecologically marginal regions, we can reconstruct the socio-economic and spatial frames of interactions, the connectivities, as well as the catchment areas, and integrate these elements into a perception and construction of these arid landscapes through these interrelations [16] (pp. 44–46).

The case studies of Graeco-Roman marginal regions, Hauran and Eastern Marmarica, showed that their water management and socio-economic organization were not centralized issues. Exploring the interactions resulting from water management forces an analysis of the spatial scales, the qualities of interactions in the geo-physical, as well as social landscapes.

People living there had to deal with it in ways and modes involving close social interaction, which, at the same time, spanned large distances and spaces. Strong ties as well as weak ties were at work between the people, resources, gods, and places. In Hauran, we found deities, festivals, and religious offices together with physically built and maintained water channels as eloquent evidence of the relationships of assumedly independent settlements, without one being more central than the other.

In Eastern Marmarica, the direction and varying quantities of runoff water together with morphological characteristics led to a collaborative rather than hierarchical organization of water harvesting and distribution and shares of cultivable land. It is not a nucleus with a surrounding environment that can be used to visualize the socio-spatial organization reconstructed by landscape archaeological methods, but rather a rhizomatic (Hauran), and a dendritic (Marmarica) structure.

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Article

From Contrary to Complementary Models: Central Places and Gateways in the South-Eastern Provence (Arles and Marseille)

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Abstract: This paper applies the concepts of gateways and centrality, formerly opposing approaches to spatial planning, by now a powerful merged tool for archaeologists, to understand the dynamics of the evolution of cities and settlements in a long-term perspective. The samples are the two main port cities in South-Eastern Provence (France), Marseille and Arles. By means of several archaeological markers it will be shown how natural landscapes and political control influenced the fate of the economic development of both cities in Greco-Roman times. Therefore, this study focuses on the aspects of trade and administration encompassing the functionality of the ports as trans-shipment centers, the impact of political interference as well as the supply and exchange of long distance and local/regional products. Within this research framework, Marseille emerged as a static gateway for its service area with a distinct perspective on Mediterranean trade. Arles, however, was the main gateway for the whole Rhône corridor in Roman times due to its strategic location in an area characterized by a variety of landscapes and the promotion of politics as a port of the *annona*. The data presented here aim to reject the frequently used narrative of an ongoing competition between Arles and Marseille in favor of a more nuanced picture of economic interactions and overlapping trading networks.

Keywords: South-Eastern Provence; Marseille; Arles; centrality; gateways; ancient port cities; trading mechanisms; political economy

1. Introduction

At the beginning of every consideration of spatial planning Walter Christaller's famous model of central places takes up a special position. Although his dissertation "Die zentralen Orte in Süddeutschland" was published as early as 1933 [1], it was not until the English translation of his work in the 1960s [2] that Christaller's concept was adopted and refined within Anglo-Saxon processual archaeology. Due to the ideal and local focus of Christaller's hexagonal configuration of market areas that stimulate the best arrangement for urban settlements, several other models were set up from 1960–1980 which account for diverse landscapes as well as regional and inter-regional relations [3] (pp. 23–25).

One of these is the concept of so-called gateway cities, which was established in 1971 by geographer Andrew Burghardt within the framework of North American colonization, using the example of Winnipeg [4]. Beyond the application in the field of historical geography, the concept has been developed further from an anthropological and archaeological point of view in analyses spanning different geographical areas and time periods [5–7]. In particular, the study of Carol Smith on different modes of distribution in pre- and early market systems [8] created the theoretical framework for further discussion: for the examination of the organization and integration of several market centers on a regional scale, Smith uses the criteria of networks, i.e., the commodity flows

between markets of the same size; of hierarchy, i.e., the commodity flows between markets of different status of hierarchy; of inclusiveness, i.e., the spatial extent of market interactions; and of political congruence, i.e., the spatial organization of markets relative to political unities and boundaries [8] (pp. 314–316), [9] (pp. 83–87). The application of these aspects leads Smith to six ideal systems of market exchange, of which the four main types should be mentioned here: the network system, the solar central-place system, the dendritic central-place system, and the interlocking central-place system.

Contemporary tendencies in using both concepts—that of central places and of gateway cities—in historical and archaeological research are characterized by two main drifts: one revolves around network theory, the other reflects Christaller's centrality in a general way as a "relative concentration of interaction" [10] (p. 219). As a consequence, the gateway concept is no more an alternative draft to the central place theory, but integrates well into the dynamic understanding of centrality. Moreover, this abstraction of centrality permits both concepts to be merged into a powerful tool for archaeologists and archaeological markers that were compiled for the more familiar central place model to be identified.

This paper aims to focus on the aspects of trade and administration encompassing the functionality of the port as a trans-shipment center with its infrastructure and buildings, the impact of political interference, as well as the supply and exchange of long distance and local/regional products. By looking at two port cities in South-Eastern Provence, Marseille and Arles, and their contributory areas throughout time, the dynamic evolution of these cities as competing and complementary places can be tracked and defined more precisely with the help of centrality and the gateway model. The application of both concepts to explain the fates of two nearby cities in the Greco-Roman world is rarely pursued: historian Simon Loseby does frequently cite the term 'gateway city' in his paper on Marseille in Late Antiquity, but the inclusion of the presented thoughts in the theoretical concept was not carried out [11]. It is the promising analysis of the central functions of Pergamon and Ephesos by Daniel Knitter that points to the potential of such studies [12] (pp. 29–47), [13].

This paper tries to contribute to several questions concerning the interdependency of the economic development of Marseille and Arles: was it competition along the trading routes that led to a loss of locational advantage for one or the other city? What role did the political interventions for the development of economy and power play (confiscation, promotion, laws)? To what extent was this predetermined by natural resources and conditions (accessibility, fertility) or influenced by geological changes (sedimentation, floods)? The answers will lead to a significant contribution to the discussion of the functions of both ports rejecting the narrative of an ongoing competition in favor of a more nuanced picture of interactions between Marseille and Arles in Roman times.

2. The Concept of Gateway Cities

According to Burghardt [4], a typical gateway city is located on a narrow strip of land along natural corridors of communication or on critical passages between areas of high soil productivity, high demand for scarce resources and economic shear lines, where cost factors change. As you have to pass this city in order to enter the hinterland or to leave that area, the gateway city is in charge of the control and exchange of the flows of products, persons and ideas between the outside worlds and the target area. Thus, the gateway city is placed on the outer limits of its service area, which is elongated and forms a dendritic market network with settlements in the hinterland. If one translates this into a scheme and adapt it for port cities on or near the coast, we get the following picture (Figure 1): the gateway city is linked to interconnected Mediterranean markets by long-distance trade routes. Since it provides the only possibility for shipped goods to be transferred to the urban markets or the associated service area, the port district of the city constitutes a core area for breaking down the bulk supplies from ships to barges into carts or storage spaces. In a further step, the goods are transported to the settlements in the hinterland and get incorporated into the local and regional network of the service area. Thus, one important characteristic of gateway cities concerns their location in an area with a high significance in terms of transportation, in order to satisfy the demand for

resources by trading and to minimize transport costs. Because of the overseas trade, the city itself is the reference for all other cities or settlements in the service area and dictates market prices. The local trading networks accept this hierarchical dependency: Their actors take care of the supply chain and absorb, thereby, a large part of the cost for goods-processing. The gateway communities maintain the trading infrastructure (i.e., routes, harbor basin) and provide a secure exchange. The importance of a consideration of the interaction between material flows and the city as a “site, place or scalar configuration in which material processes . . . are embedded” [14] (p. 75) has been stressed by Markus Hesse from a present-day perspective, especially in regard to modern seaports [14] (pp. 83–87).

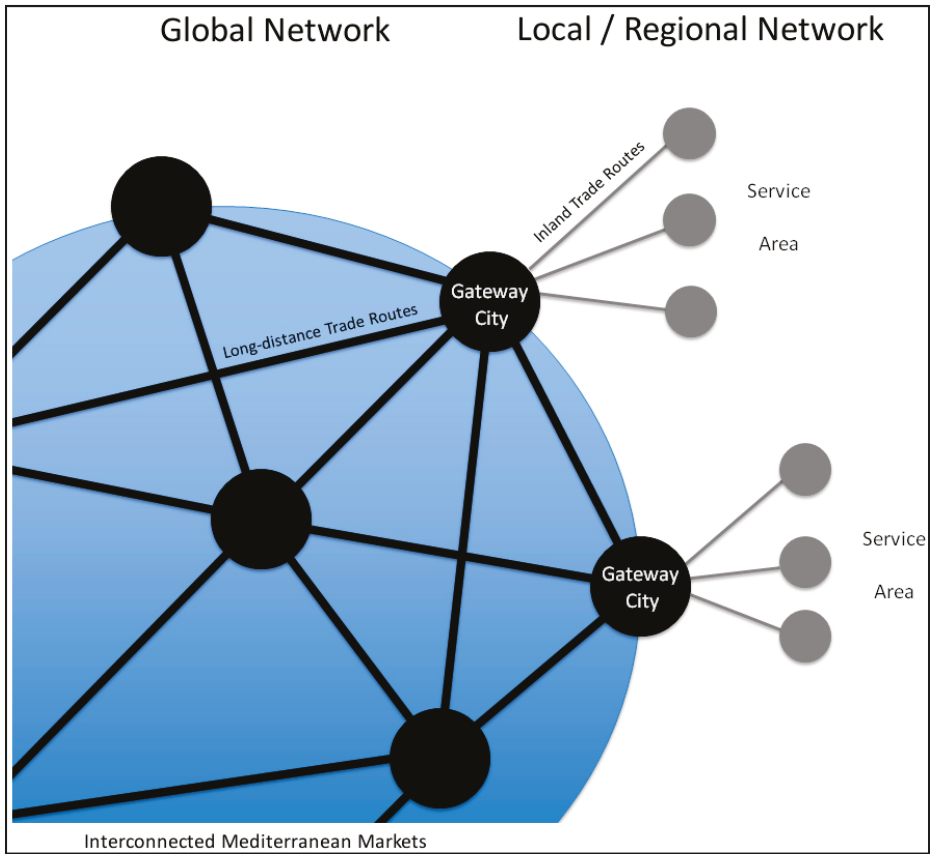


Figure 1. Scheme of port cities acting as gateways between two different market networks.

One of the advantages of the gateway model concerns its dynamic of retracing the evolution of the port cities [4] (pp. 272–273): The first step is always visible in a boom in building projects and infrastructure, during the growth of trade and population. If the service area of the gateway city is large and the cultivated land fertile enough, it is possible that new central places can emerge within this area. Subsequently, the former gateway assimilates to a central place, but with a higher hierarchical status than the other cities due to its favorable position for transport and trade. If, however, the service area is small, the gateway city keeps its function and a static situation exists.

In the case of decreasing power of a gateway city a few possible reactions on behalf of the city exist [5] (p. 42): on the one hand, it can restrict its influence to the remaining sector, which results in

an economic downturn. On the other hand, it can turn its focus onto new geographical areas that are unaffected by the emerging central place. Alternatively, the city itself increases its own competitiveness by the formation of new socio-political authorities: They can promote the gateway city; military actions can enlarge the service area or eliminate the competitor; new classes like specialized traders or markets can move the boundaries; and newly established trading routes can increase the locational advantage of the gateway. Thus, the influence of political decisions on the fate of these cities is immense.

3. Arles and Marseille

The two cities of Marseille and Arles in South-Eastern Provence offer a worthwhile case study. Located within a range of about 90 km of each other the development of both cities was closely connected and dynamic throughout the whole Greco-Roman era (Figure 2).

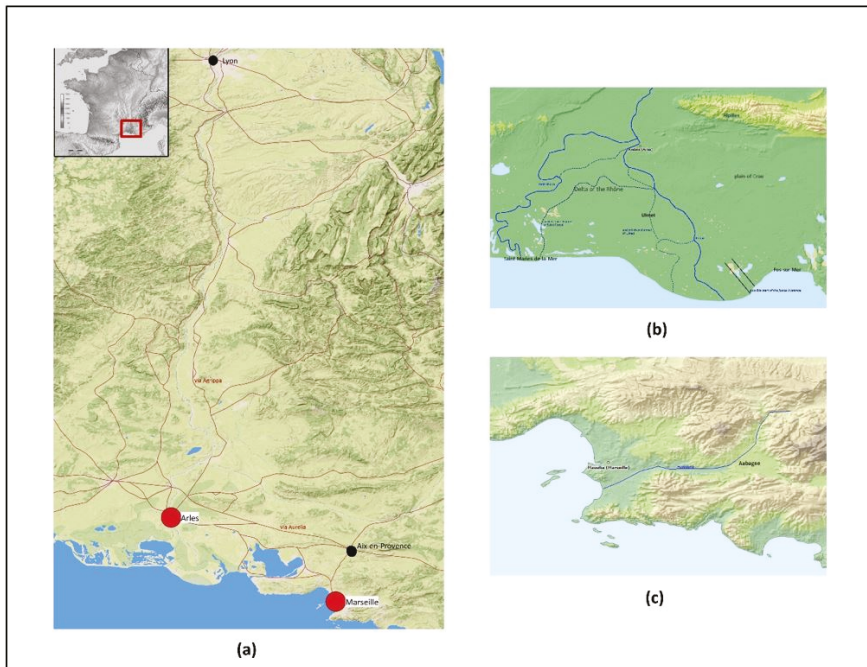


Figure 2. (a) Map of the Rhône corridor showing the main sites, streets and geological features mentioned in the text [15]. (b) Detail of the landscape around Arles showing the main sites, modern and ancient river courses and the assumed starting point of the *fossae Marianae*. (c) Detail of the landscape of Marseille showing the main site, the approximate course of the river Huveaune and the geological features. Base map © Ancient World Mapping Center, <http://awmc.unc.edu/wordpress/map-files/>.

3.1. The Natural Environment and Transport Geography

When the Phocaeans founded Massalia as an *apoikia* in the natural bay of modern Marseille around 600 BC, the main arguments for the location of the colony comprised the existence of a safe and secure harbor basin—protected from the sea currents and the Mistral—and the possibility to fortify the surrounding city hills (Figure 2c). Until the second century BC, it was the maritime perspective that was the most important in order to extend the Phocaeen trade network on a micro- (Southern Provence), meso- (Iberia, Italy) and macro-level (Asia Minor), with Massalia as a point of departure [16] (pp. 143–169). Thus, the immediate environment was limited to few kilometers and was completely

cut off from the inland by the massifs of Estaque and Étoile in the north, Garlaban in the east, and the foothills of the Calanques in the south. Solely the navigable river Huveaune provided access to the small and likewise enclosed plain of Aubagne in the east of Marseille. Therefore, the agricultural use of the hinterland with vine and olive trees was possible, aimed, however, only at the self-sufficiency of the settlements and Marseille itself, and not at a mass export. Pliny the Elder praised the characteristic taste of the wines of Marseille and reported on awareness of it in the Roman world (Plinius, *naturalis historia* 14.8.38); therefore the export of special quality commodities in low numbers has to be assumed. Clay and rocks for building activities were easily accessible [17,18]. To enter the Rhône plain, one had to cross the hilly passage north of the city, which did not become comfortable until the link to the via Aurelia had been established to reach Aix-en-Provence (Aqua Sextiae) and Arles (Arelate).

Arles on the other side acted since the beginning as a trading post between Celtic-Ligurian tribes in the Gallic inland and Phocaean colonies at the seaside (Figure 2b). The city itself consisted of an autochthonous district and the newly founded *emporium* called Theline (c. 540/30 BC), which has to be on the later urban area of Arles, but remains archaeologically unlocated. At 35 km distance to the mouth of the Rhône, this urban conglomeration built on limestone rock was the first safe location to cross the river, so that its position resembled one of a coastal strip. It formed a junction between the wide and high-yielding plains with adjacent valleys on the east and west of the city and the stream of the Rhône, which connected the inland with the Mediterranean. The variety of natural environments encompassed in the north agricultural land, especially for grain cultivation, in the north-east the limestone massif of the Alpilles as a source for water and building materials, in the east the unfertile plain of Crau, that was ideal for sheep herding, and finally in the south the alluvial soil of the delta [19]. In terms of the overland communication axes, in and near Arles several of the main Roman long-distance roads crossed the area and made the city a hub for east–west (via Aurelia) and south–north (via Agrippa) traffic.

3.2. Natural and Political Factors

After having experienced a significant boom in growth and wealth—for Arles instantly after its foundation, for Marseille after the Punic wars, when its area of influence expanded to a wider hinterland, parts of modern Liguria and others—both cities and their further development were influenced mainly by natural and political factors.

For Marseille, a major issue consisted in the siltation and maintenance of the harbor basin (Figure 3). Direct witnesses of that fact are three wrecks of the first and second century AD, being found in the layers of the port sediments at the place Jules-Verne, whose form point to dredging ships. Furthermore, the archaeological excavations revealed traces of at least three larger dredging activities in the basin between Augustan times and the fourth century AD [20] (p. 48). The alterations of the access to the waterfront could explain why there was such a heterogenic conception: sections of the quay were built with monumental stone blocks (quai de la Samaritaine), and others were shored up by wooden planks and stakes and had piers projecting into the basin (place Jules-Verne) [20]; elsewhere, an open gravel area was created (place Général-de-Gaulle) [21] and the so-called *corne du port*, the artificially cut inner basin of la Bourse, was narrowed several times [22]. If we look at warehouses and magazines, a shift from many archaeological structures for storing bulk wine in *dolia* in the first and early second century AD to few warehouses for storing wine in amphoras in the late second to fourth century AD can be observed around the port basin. This fact is a common feature in many Roman ports of southern France [20].

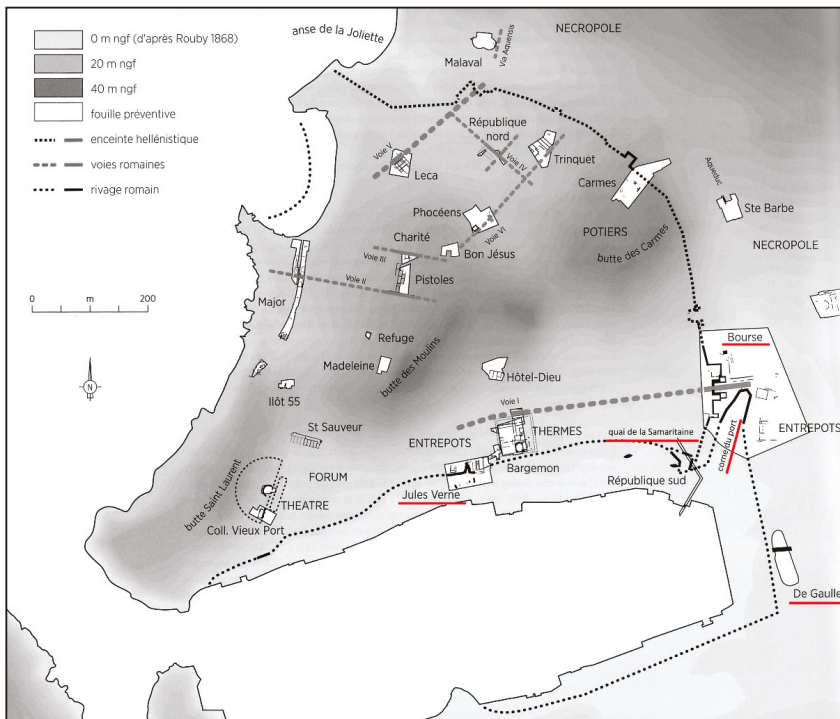


Figure 3. Plan of Marseille with the most important sites mentioned in the text (after B. Sillano [23] (Figure 1)).

The urban development of Arles was determined by frequent and strong inundations of the Rhône like the one in 175 BC, which destroyed large parts of the city (Figure 4). Furthermore, these forces altered the course and the number of arms of the river in its delta—differing mentions in the literal records from two to seven arms reflect this unstable dynamic [24]. In the city of Arles, modern urbanism and the force of the Rhône have destroyed most evidence of the ancient fluvial port. On the right bank of the river (modern Trinquetaille) several fragmented structures let us think of a homogeneously planned port district. A promising archaeological record is made in the area of the gare maritime, where parallel walls on a large scale might represent a great warehouse [25]. Some substantial rows of arches that came to light recently on the left bank at the place J.-B. Massillon can be interpreted as some sort of protection against the flood, a weakening mechanic against the stream [26]. Large rows of amphoras that are stacked vertically in the ground at several places on the right bank of the river can be interpreted as an attempt to secure the danger zone. In addition, two large assemblages (gisements) of building material, ceramics, statue fragments, pebbles, etc. that accumulate in the river itself near the right bank might be the remains of the backfill of the original quayside, being washed into the river during one of its destructive incidences in the fifth or sixth century AD.

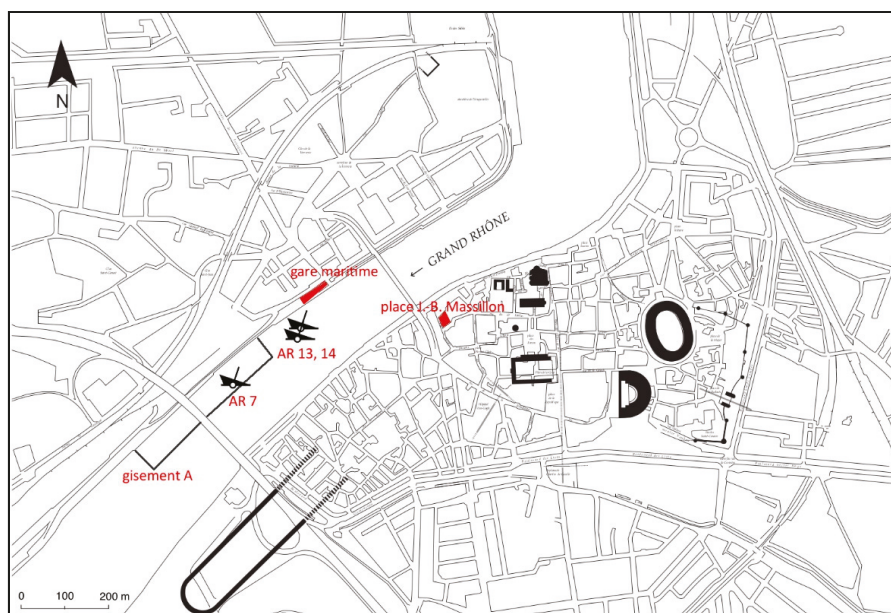


Figure 4. Plan of Arles with the most important sites mentioned in the text (after M. Heijmans [27] (pl. I)).

Besides the hydrological difficulties, two political decisions shaped the future development of both cities. Firstly, the consul Marius ordered to construct a navigable canal in 103/02 BC, the *fossae Mariana*, which connected the fluvial port of Arles with the bay of Fos [28]; its course is only partly attested archaeologically (Figure 2b: see the parallel lines). Thus the troublesome ingress of large ships into the mouth of the Rhône became obsolete. The *fossae* formed a quick and easy way to provide military and food supply and strengthened the link between Rome and Arles, leaving Marseille aside. It seems, however, that this new canal was out of use as early as in the first century AD. Therefore, another system was established, also advantageously for Arles: several small trans-shipment-centers like Saintes-Maries-de-la-Mer, Fos-sur-Mer and Ulmet were installed on the coast south of Arles to transfer the trading goods from deep-sea vessels to specialized fluvio-maritime ships [29]. Although these activities and the necessary workforce caused additional costs, one gained an optimized cycle of ship traffic in the Rhône delta and control over the number of ships, duration and length of the trip.

As a second political factor, the consequences of the civil war between Caesar and Pompey (49–45 BC) must be cited. After having chosen the wrong side, Marseille lost—besides the treasury, weapons and ships—wide parts of its former territory along the Ligurian coast, but also in its immediate environment to Arles and Lyon. The colonial territory of Arles consisted now of mosaics of land strips, but as well gained additional resources [30].

Its geographical position, a large hinterland and the importance for supplying the whole province as well as adjacent provinces made Arles the nodal point of economic and political interests: on the one hand the city was partly destroyed and besieged in the third and especially in the fifth century AD by Germanic tribes and Roman usurpers; on the other hand it was a destination for the *annona*-ships carrying grain and olive oil for supplying cities and military in a contractual framework of the Roman state. Evidence of the presence of this promotion in Arles by the Roman state is presented through several inscriptions mentioning *corpora* like the *lenuncularii*, the *utricularii* and the *navicularii* that were incorporated in state services [31]. More precisely, a bronze plate found near Beirut in modern Lebanon

describes a dispute between the *navicularii* of Arles and some officials of the grain transport, settled by the *praefectus annonae* [29] (p. 36).

Marseille developed into an intellectual center and was characterized by an impressive Christian topography in late antiquity. Nonetheless, the city maintained its economic importance which is shown by some wooden toll plates from the port district, two of which are marked with (*Quadragesima*) *Gall(iarum) st(atio) Mass(iliensis)*, that is the office which was responsible for raising the 2.5% tax on imported and exported products [32].

3.3. The Role of Supply

To get a quantitative insight into the imported products of both cities, quantified assemblages belonging to more or less reliable circumstances found in the immediate port area permit some interesting observations. For Arles, the analyzed data covers the time span from the second to the fifth century AD, including material from the excavations at the place J.-B. Massillon [33] (pp. 76–96, Tables 1–3) and the *gare maritime* [34] (pp. 191–192), and from the sondages around the wrecks Arles-Rhône 7 [35] (pp. 41–42, Figures 8,9), 13 [36] (pp. 128–129, Tables 1,2; p. 132, Tables 3,4) and 14 [37] (p. 134, Figure 18). The findings from Marseille derive from several sondages in the area of la Bourse, i.e., the area around the north-eastern corner of the port basin: sondages DY09 [38] (p. 381, Table 5); 6/7 [38] (pp. 385–390, Tables 11–25), [39] (p. 171, Figure 6); 10 [38] (pp. 391–395, Tables 26–46); 11/12 [38] (pp. 396–400, Tables 47–55); aires 1 and 2 [40] (pp. 302–346), [41] (pp. 302–304, Tables 1–6); wreck [38] (pp. 383–385, Tables 8–10). Here, however, the data covers only the first half of the third century and the fifth century AD. The comparability of the assemblages is ensured by the proximity to the port area, the similar nature of the archaeological record—mainly washed up and accumulated sediment layers—and by the homogeneously quantified ceramics. All assemblages have been quantified by the counting of all shards except one from Arles, of which only the so-called NTI (*nombre typologique d’individus*) was published. Due to the nature of research, only fine and coarse wares as well as amphoras can be considered.

For Arles in the second to fifth century AD, the supply of plain and coarse ware was dominated by regional Gallic production from the central Rhône valley transported via the river as a fast trade route (Figure 5; Appendix A, Table A1): the *terra sigillata luisante* was manufactured in the valleys of the Savoy, the workshops of the *terra sigillata clara B* were located in the area between Lyon and Vienne, and those of the *céramique métallescente* in an area between Trier and Lezoux. Wares from Southern Provence were significantly less present, including the DSP (*dérivées des sigillées paléochrétiennes*) and the *céramique à pâte claire* produced around Marseille and the so-called south-gallic *terra sigillata*. Across the Mediterranean, ARS (African Red Slip Wares), especially, were transported to Arles, but some cooking wares from modern Tunisia, too. Imports on a smaller scale from Spain, Italy and the Eastern Mediterranean complement this picture. The bulk of the amphoras were imported from North Africa with a growing percentage up to 70% from the third century AD on, above all the classic types *Africana 1* and *2*, but also the type *Leptiminus II*. The workshops of southern Iberia made up 10–20% of all amphoras, and together with those of southern Italy (10% in the fourth century AD) and Gallia itself they represent reliable and constant trading connections during Late Antiquity. The data for the amphora types from the eastern Mediterranean is the most puzzling: Their values fluctuate in the contemporaneous urban and port assemblages from 3–44%. One possible explanation of the existence of such a bandwidth might be that the smallish eastern containers were loaded onto carts in Marseille or onto barges in one of the trans-shipment points at the coast; then the amphoras would have been transported to the main hub, Arles, where some of them were distributed on the urban market, and some were stored in the magazines for further distribution into the hinterland.

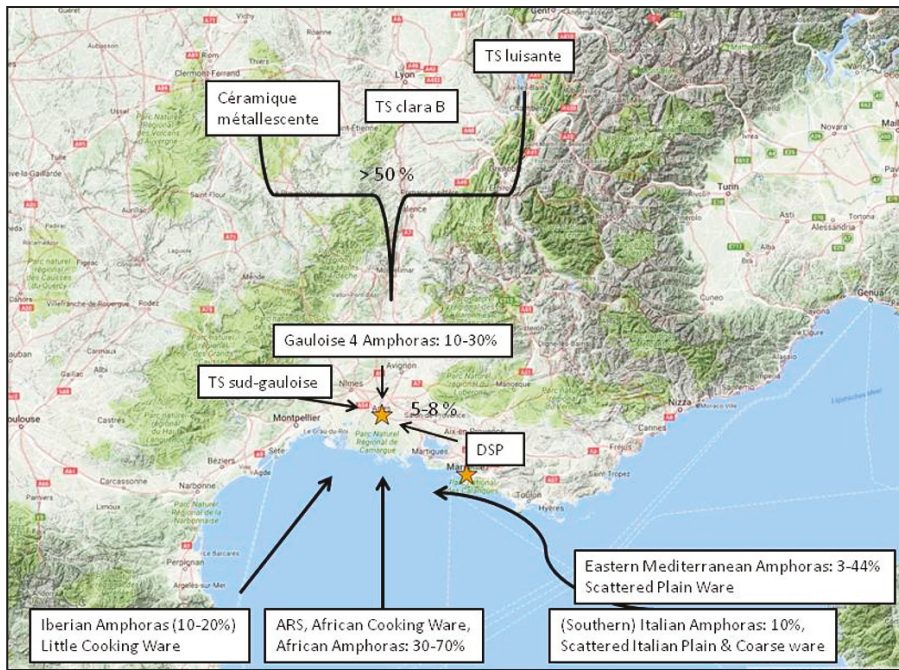


Figure 5. Map showing the intervals of percentages of fine wares, coarse wares and amphoras from the port assemblages of Arles, second to fifth century AD (after Appendix A, Table A1). Base map © Google Maps.

The data from the port area of Marseille show clear differences (Figure 6; Appendix A, Table A2): already for the first half of the third century AD the shards of the plain and coarse wares show a higher frequency of production from southern Gaul than from the central Rhône valley. This culminates in the fifth century AD, when the assemblages from Marseille consist of 72–84% of DSP-wares. Even though no atelier of these fine ceramics has been identified yet, the clay analyses point straight to the clay sources in the Aubagne plain in the immediate hinterland of Marseille [42] (pp. 261–262). The same observations are valid for the *céramique à pâte claire* or *grise*. It is obvious that those pots from the central Rhône valley that make up the majority in Arles are only scarcely represented in Marseille. Besides the steady supply of ARS and African cooking wares there are some minor quantities of Italian fine and coarse wares as well as table wares from the eastern Mediterranean. In regard to the amphoras, one recognizes a shift from 50% Gallic containers around 200 AD to the absolute lack of local production in the fifth century AD. This development was in favor of amphoras from the eastern Mediterranean that made up to more than one third of all amphoras. Together with the disappearance of Hispanic containers, the transition of the supply of middle Italian amphoras to southern Italy and the strong partnership with North African traders, it seems that the supply of Marseille with foodstuff transported in amphoras was much more linked to the external economical trends in trade during late antiquity than Arles [11] (pp. 170–174).

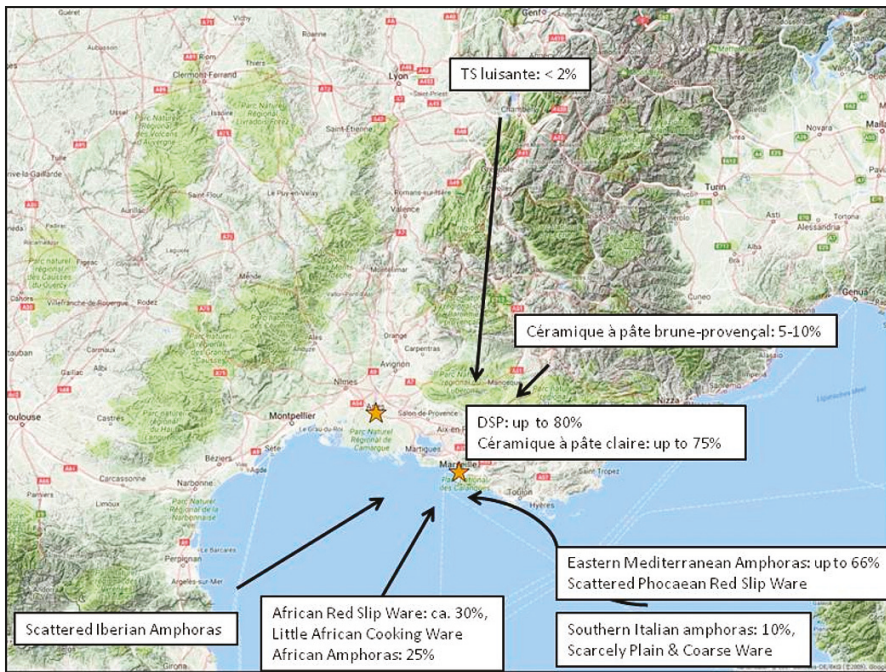


Figure 6. Map showing the intervals of percentages of fine wares, coarse wares and amphoras from the port assemblages of Marseille in the fifth century AD (after Appendix A, Table A2). Base map © Google Maps.

4. Gateways and Centrality

If we return to the concept of gateway cities and the issue of centrality, how can these theoretical frameworks help us interpret and explain the presented data? Marseille and Arles had been gateways or places with a high centrality: on the one hand, with a geographically very restricted service area; on the other, with an enormous potential regarding the hinterland. The river Rhône and in extension the Saône made the whole corridor from Arles in the south up to Lyon and further north one economic unit, in which other cities and settlements could emerge over time at a certain distance, for example Lugdunum (Lyon). Both cities were located in places with a high geographical significance related to the circulation of goods and persons. This is why they had major power over the control and distribution of trading goods, apparent through the existence of toll stations (*stationes*) [43] (pp. 24–31, 44–46). The port installations and trans-shipped products help understand that the role of long-distance trade was immense and contributed to the hierarchical status of the cities as an essential supply node for the tributary hinterland. The city officials and associations took care of reliable trade routes, the sufficient depth of the port basin, adequate mooring places and a fast and comfortable transport of the products into magazines or straight to the local market. Even if Marseille and Arles suffered different fates in late antiquity—loss of political territory for Arles, Marseille being a place of retreat for the Roman and Christian aristocracy—the long-distance trade seems to have been unaffected.

Massalia evolved from a Phocaeen colony by means of increasing territorial control to a place with high centrality, especially for trade. For its small service area, it remained one static gateway for a long time. This explains why the supply of the late antique Massilia with pots produced in the city itself or the immediate hinterland could compete with the ARS wares that flooded the markets of the western Mediterranean port cities almost everywhere else. Furthermore, these productions saturated

the city market, so that in consequence there was no place left for other Gallic wares. For foodstuff, however, one was mainly dependent on imports and long-distance contacts with other provinces at all times. With the politically motivated rise of Arles, Marseille became increasingly unimportant as a gateway, but obtained its hierarchical status due to the strategic position of its port.

In contrast, Arles was planned from the outset as a gateway city, and after the initial boom it benefited from its unique geographical position and, in consequence, from the economic potential of the city and its wide service area. This caused politics to promote the status by a new system of economic infrastructure, the *fossae Marianae* and, consecutively, the trans-shipment centers on the coast—despite the imminent danger of flooding that put an end to urban development in the sixth century AD. Arles had control over various resources and was an *annona* port with special rights and a specialized workforce for the port activities. It seems that what we have here is a politically motivated strategy of maximization which placed the importance of the city on an economic foundation. In this sense, Arles is a good example showing how closely the status of a dynamic gateway is linked to the model of political economy [44]. This supra-regional level of centrality explains the supply of Arles with products manufactured in the distant central Rhône valley ignoring those from Marseille and the nearby environment. Due to the river, no other gateway or proper river ports could become established inside the service area of Arles along the Rhône as a competitor: The river constituted a fast trade route, and kept transport costs low, and the distance between cities high. Despite the focus of Arles on the Gallic inland, the city constantly received foodstuff as imports from production centers across the whole Mediterranean.

If we take a look into academic literature, one narrative defines the relationship of Marseille and Arles in Roman times: the events of the civil war as a drastic turning point for the future urban development and relation of both port cities. Whereas Raoul Busquet and Régine Pernoud describe the economical role of Marseille in imperial times as commerce in slow-motion (*commerce au ralenti*) in comparison to the status in the pre-Roman era [45] (pp. 87–95), S. Loseby stresses the ongoing competition between the two cities after the punishment of Marseille resulting in the loss of its status as the main gateway in the area. Moreover the author uses this narrative of Marseille as a backwater in order to focus on its reappearance as focal port for trading and passengers to the disadvantage of Arles at the end of the sixth century AD [11] (pp. 179–183). If one considers all the evidence presented above, it seems that the economic interactions between Arles and Marseille need to be described in a more nuanced manner. Arles certainly was the main gateway for the Rhône corridor during Roman times—the role of Marseille, however, was not a minor and competitive one: the city of Marseille was a complementary part of the supra-regional trade network of Arles; but together with its service area it was also an independent consumer city that imported products from the Mediterranean markets and produced wares to meet the demand of the city itself. This idea of interlocked economic practices with an internal and external range gets support from the research of Jane Jacobs and more recently Peter Taylor about urban development, who stress the importance of cooperating commercial agents in cities with complementary functions [46,47]. Some additional archaeological observations might make this clearer: in the Roman villa of Goiffieux at Saint-Laurent-d’Agnay, which is located some 25 km to the south-east of Lyon, a fragment of an amphora with a *titulus pictus* was found [48]. The shard belonged to a type produced in the workshops of les Carmes in Marseille during the first century AD and on it there were remains of raisins cultivated in the Aubagne plain in the territory of Marseille. The painted inscription gives us an interesting insight into the trade route of this amphora: the known trader, Marcus Licinius Rufinus, who had bottled and sent off the wine container from Marseille, conducted business with a certain Staius Regillus as the recipient, but the amphora was registered in and transported via the port of Arles. Therefore, the incorporation of Marseille in the supply network of Arles is epigraphically attested. Another clue stems from the represented African amphora types in the assemblages of Marseille and Arles: in the first half of the third century AD, we find in Arles a variety of North African containers with the *Africana* 1, 2 and the *Leptiminus* II as the main types. The latter is absent in Marseille, but the city imported a significant amount of Dressel 30-amphoras,

presumably from Mauretania Caesariensis. Even if the question of the content of an amphora type is not an easy one [49] (pp. 463–475), we can assume that they contained different products (*garum*, wine, oil); thus, Marseille's imports added to the supply of the whole region. Together with the high percentages of amphora imports from the eastern Mediterranean in Marseille and the constant supply of Arles with Iberian and Gallic containers, it seems that there was a complex interaction of the trading mechanisms of both port cities. One explanation for these partly overlapping, partly differing, trading connections might be the fact that both cities had a distinct focus: Arles was orientated on inland trade, as an *annona*-port it was also supplied with products of the Mediterranean; Marseille, instead, had its main focus on sea trade and acted more as a hub for traders performing cabotage and tramping. The ships departed from one of the ports of the Tyrrhenian coast or from other primary or secondary port systems on the Ligurian coast or the Gulf of Lion like Forum Iulii (Fréjus), Antipolis (Antibes), Lattara (Lattes) and Narbo Martius (Narbonne); then, they sailed along the coast and anchored in sea ports like Marseille where products were sold and acquired at the market price [50] (pp. 107–126), [51]. Future research in the named port cities will provide deeper and more precise insights into the distribution systems and interplay of the commodity flows of the whole region. In conclusion, it was the geographical proximity of the two economic systems that led to the interwoven interaction of Marseille and Arles.

5. Concluding Remarks

This article tried to demonstrate that the concept of 'gateways' can contribute to the discussion of the development of cities in Greco-Roman times by using archaeological markers that were acquired for use within issues concerning centrality and central place theory. The locational advantage of Arles in the midst of an area adjoined by several cultural landscapes was its decisive difference to Marseille. Thus, it was the political decision of the Roman government to support Arles as a port city that outweighed the environmental danger of the frequent inundations. As a consequence, Marseille lost its predominance and was now one important trans-shipment port of the prevailing Arles gateway. In this regard, Marseille complemented the supply of Arles and the whole Rhône corridor, but was also a static gateway for its own tiny service area, in which tableware was produced on a large scale for the demand of the city and export along the coast. The functioning of Arles as the main gateway was facilitated by the river Rhône which served as a fast, safe and cheap trade connection to the Gallic inland. The complicated and dynamic interaction between both cities cannot be explained altogether by the use of the gateway concept. However, the concept provides a helpful framework to understand that there was no competition between Marseille and Arles on an economic level, but they were part of an integrated system of networks. The dynamic of the Arles gateway integrated the static centrality of Marseille.

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Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Table A1. Percentages and intervals of percentages of fine wares, coarse wares and amphoras (including the main types) from the port assemblages of Arles. Data from [33] (pp. 76–96, Tables 1–3), [34] (pp. 191–192), [35] (pp. 41–42, Figures 8,9), [36] (pp. 128–132, Tables 1–4), [37] (p. 134, Figure 18). Quantified by the counting of all shards: time spans 175–250 AD; 450–500 AD. Quantified by the estimation of the NTI (nombre typologique d’individus): time span of 300–425 AD.

Fine Wares	175–250 AD	300–425 AD	450–500 AD
terra sigillata clara B	73%	8%	
c�ramique m�tallescente	10%		
terra sigillata luisante		36%	57%
terra sigillata sud-gauloise	5%		
DSP-Wares		8%	7%
Other Gallic Wares		4%	
African Red Slip Ware	6%	44%	33%
Glazed Italian Ware	3%		
Eastern Plain Ware	1%		
Coarse and Cooking Wares	175–250 AD	300–425 AD	450–500 AD
c�ramique � p�te claire	19–34%	15%	
grise de Vaison	7–9%	8%	14%
Other Gallic Wares	7–12%	27%	18%
African Cooking Wares	34–61%	47%	18%
Italian Cooking Wares	2%	2%	11%
Eastern Coarse and Cooking Wares	4–5%	2%	
Amphoras	175–250 AD	300–425 AD	450–500 AD
Gallic (Gauloise 4)	6–34%	20%	10%
North African (Africana 1,2,3; Leptiminus II; spatheion 1; Dressel 30)	29–39%	42%	70%
Iberian (Almagro 51c, Dressel 23)	9–20%	11%	12%
Italian (Middle Roman 1a, Keay 52, Empoli)	0,5%	7%	1%
Eastern (Agora F65-66, C�lestins 1a min., Late Roman 1)	10–22%	16%	4%

Table A2. Percentages and intervals of percentages of fine wares, coarse wares and amphoras (including the main types) from the port assemblages of Marseille. Data from [38] (pp. 381–400, Tables 5–55), [39] (p. 171, Figure 6), [40] (pp. 302–346), [41] (pp. 302–304, Tables 1–6). Quantified by the counting of all shards.

Fine Wares	200–250 AD	425–525 AD
terra sigillata clara B	24%	
terra sigillata luisante	5%	1–2%
terra sigillata sud-gauloise	33%	
DSP-Wares		72–84%
African Red Slip Ware	24%	10–26%
terra sigillata hisp�nica	1%	
Italien Thin Walled Wares	11%	
Phocaeen Red Slip Ware		0.5–1%
Coarse and Cooking Wares	200–250 AD	425–525 AD
c�ramique � p�te claire/grise	20%	77–81%
brune proven�cale	5%	6–8%
Other Gallic Wares	5%	10–15%
African Cooking Wares	46%	0.5–2%
Italian Coarse and Cooking Wares	9%	
Eastern Coarse and Cooking Wares	5%	

Table A2. Cont.

Amphoras	200–250 AD	425–525 AD
Gallic (Gauloise 4)	50%	
North African (Africana 1,2,3; spatheion 1; Dressel 30; Keay 35)	21%	19–54%
Iberian (Almagro 51a-b, Dressel 20)	11%	0.5–2%
Italian (Dressel 2-4 ital, Keay 52)	10%	2–10%
Eastern (Late Roman 1,3,4)	4%	12–44%

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Article

Timacum Minus in Moesia Superior—Centrality and Urbanism at a Roman Mining Settlement

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Abstract: When applying traditional criteria of Roman urbanism, several settlements in the province of Moesia are not recognised as parts of the urban network. To avoid this, previous criteria of urbanism should be revised. This paper suggests revisions, which provide a more inclusive definition of urbanism: Thus, instead of focusing on administrative status and monumentality as primary markers of urbanity and urbanization, development factors for agglomeration and centrality are emphasized as decisive conditions for, and characteristics of, urban settlement. To provide a case study for this theoretical outline, the upper-Moesian mining settlement of Timacum Minus is evaluated by ideas derived from a critical appreciation of Walter Christaller’s central place theory. Timacum Minus did not have official settlement status and monumental character, yet, it developed as a central place in the unique landscape of the Timok valley. This was due to its location as a central road station, military post, and settlement along the important interregional Timok valley road as well as the site hierarchy as the base of the centralized administration of the Timok valley mining district. Hence, Timacum Minus displays different levels of centrality. Interestingly, the site only held these properties during the Roman Principate, although its central location and mining activities also existed in pre-Roman and post-Roman times. This demonstrates the significance of centrality mechanisms as determined by local and regional circumstances and historical conditions. Accordingly, it is argued that these circumstances and the diverse character as a central place also turned Timacum Minus into an urban site, irrespective of status and monumentality. This definition of the site provides not only an example of how to use central place theory in current archaeological thought but also possibilities for re-thinking urbanism in Roman Moesia.

Keywords: Timacum Minus; Moesia Superior; central place theory; centrality; Roman urbanism; settlement status; Roman mining

1. Introduction—Central Place Theory and Roman Urbanism

When Walter Christaller first introduced his ‘central place theory’, he stated that centrality patterns were logical and organic and, thus, immanent to principles of settlement development [1] (pp. 21, 25). Accordingly, a central place for Christaller was a town. He even went as far as stating that the main ‘profession’ of a town was merely to be central to its environment, both in terms of the geometry of location and regional hierarchy [1] (p. 23). With this conclusion, Christaller made a clear statement, which was followed by many scholars concerned with settlement patterns in archaeology [2–6]. Yet, since the 1930s common consensus shifted to believe that central place theory is not as static as suggested and also does not solely relate to urban settlements. Instead, a wide variety of site types that held central properties of any kind and contributed to political, economic, and social networks have been referred to as central places [3,5,6]. Clearly, this is a desirable development within archaeological thought. Yet, to build critically on the ideas derived from central place theory, interpretations need to be able to differentiate urban from non-urban sites.

In Roman Archaeology, however, the outline of urban criteria is no easy task. During the past 150 years, the discipline has struggled to come to a coherent conclusion about urbanity. Problematically, the approach to Roman urbanism has primarily been guided by ideological perceptions. Accordingly, the Roman town has not only been viewed as a manifestation of Roman imperialism and implementation of power and political strategies in the provinces, it has also been perceived as both the primordial and constant of Roman culture. Based on the works of Republican and Principate-times Roman authors, urban settlements in the provinces have, since the 19th century, been addressed as “small likenesses” of Rome [7] (p. 41), as an ideal translation of urban form and, thus, implementation of Roman imperial ideology [7–9]. This idealistic conception has resulted in a paradox situation: Throughout the Roman Empire a Roman town has been identified as such if it was officially installed as a manifestation of Roman, ideological and imperial power in the provinces and resembled Rome in terms of architectural markers, which conveyed the meaning of this manifestation. This concept nicely fitted 19th century conceptions of imperialism and cultural primacy, however, 19th century *Zeitgeist* also initiated discussions in contemporary urbanism, where Rome was perceived as the formal and moral pitfall of urban development, as a metropolitan dystopia, which needed to be avoided in favor of well-planned and functional towns. Here, the Roman towns in the provinces were used as ideal examples for such urban implementations [10,11]. The paradox of these 19th century opposite arguments quickly settled in archaeological thought and have persisted ever since. Although the debate of the past two decades has long acknowledged that Empire-wide patterns of idealistic implementations of urbanism are a myth [12], the theoretical vacuum of Roman urbanism has not yet been successfully filled and traditional approaches to urban character in the provinces’ settlements remain predominant today. These approaches primarily focus on the official status of settlements as *coloniae* or *municipia*, which relates to their independent administration, and their monumentality both in size and architectural equipment with certain building types, which relates to urbanization and urbanization rates. What criteria a Roman town needed to fulfil in order to be perceived as a Roman town has been more contingent upon ideological perceptions of urbanism, politics, and culture than upon local and regional circumstances for its development [7,8]. This becomes clear when looking at a most recent example: In his empire-wide and generally brilliant study of Roman urbanism, John Hanson has recently shown that there is not necessarily a direct relationship between status granting, settlement size, and the presence and number of monuments. This alone should make a point for the need to reassess the characterization criteria for urban sites. Yet, Hanson still states that urbanism was rather “made up by a small number of important sites than by larger numbers of unimportant sites” [13] (p. 94), and in his catalogue of urban sites of the Roman Empire, he correspondingly, for example, does not include *Timacum Minus*. I, however, argue that before implying categorical patterns and characterizations of Roman urbanism based on idealistic perceptions of urban form and imperial agendas, one needs to define what ‘important’ and ‘unimportant’ mean and that this relates to local and regional levels.

2. Urbanism in Moesia—Settlement Classification between Paradigm and Paradox

The need for a reassessment of definitions of urbanism per se and its characteristics is exemplified very clearly by the Roman province of Moesia. Moesia was installed as a province sometime between AD 15 and 45 and divided into Moesia Superior and Inferior during the reign of Domitian. To date, these two province parts/provinces have always been investigated separately, although they display very similar settlement patterns and settlement development factors. When compared to other regions of the Roman Empire, Moesia has frequently been referred to as being little urbanized in terms of both the number of settlements and their monumentality [14–16] (p. 255). This perception, however, mostly derives from the criteria of traditional approaches to urbanism. When, for example, applying the traditional urban marker of administrative status to Moesia, the province had 15 newly installed Roman settlements with official status (Figure 1; Table 1). This, indeed, does not appear to be a pattern of dense urbanism. Yet, when taking a closer look at Moesian settlements, seven sites with considerable

local and regional significance fall out of the urban pattern, as they did not have official status as a colonia, a municipium or the like (Figure 1: nos. 5, 6, 8, 12, 16, 18, 19; Table 1). These sites are commonly referred to as ‘quasi-urban’ settlements [14,16], [17] (pp. 68–70), [18] (pp. 211–217). I argue that this is no adequate terminology, and that before implementing a hierarchy of urban, quasi-urban, and non-urban sites, one should consider re-defining urban criteria. Mapping urban settlement in Moesia without the seven settlements outside the status-pattern impairs the determination of settlement networks and urban evolution. Accordingly, it can be useful to find a way of settlement classification for Moesia, which includes these sites instead of marginalizing them. Hence, I use a different approach to urbanism and urban criteria: Instead of classic markers of administrative status and monumental building, I focus on locally and regionally defined development factors for agglomeration [19]. In the case of Moesia, these factors are long-term military presence, imperial foundation acts, and mining activities (Figure 1; Table 1).

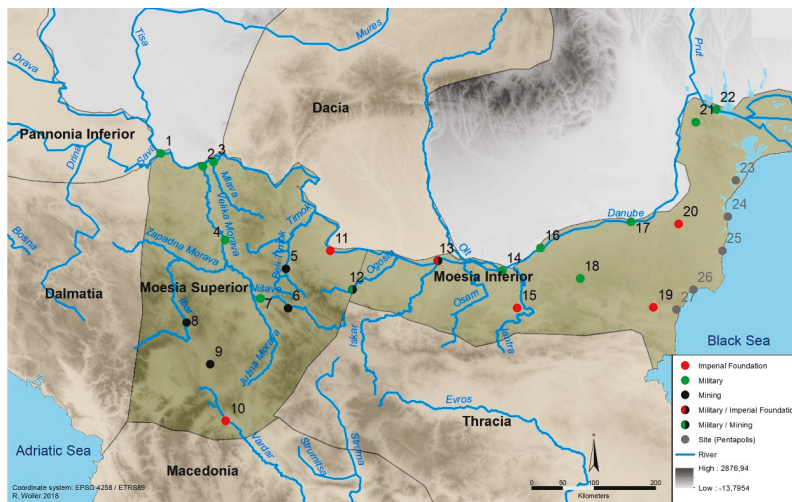


Figure 1. Overview of urban settlements in Moesia (Superior and Inferior), including the Pentapolis at the western Black Sea littoral. © Raffaella Woller, Lina Diers.

Table 1. Classification of Moesian urban settlements by significant local and/or regional development factors (military presence, imperial agency, mining) instead of administrative status. Administrative status of respective settlements for comparison is indicated in parentheses.

Military Garrisons with Civilian Settlement (Legionary, Auxiliary)	Imperial Foundations (Coloniae, Municipia, Others)	Mining Settlements (with or without Military Presence)
Viminacium (3) (municipium)		
Sigidunum (1) (municipium)		
Margum (2) (municipium)		
Horreum Margi (4) (municipium)		
Naissus (7) (municipium)		
Novae (14) (municipium)	Scupi (10) (colonia)	TIMACUM MINUS (5)
Durostorum (17) (municipium)	Oescus (13) (colonia)	Ulpiana (9) (municipium)
Troesmis (21) (municipium)	Ratiaria (11) (colonia)	Municipium DD (8)
Noviodunum (22) (municipium)	Nicopolis ad Istrum (15)	Montana (12)
Sexaginta Prista (16)	Marcianopolis (19)	Remesiana (6)
Abritus (18)	Tropaeum Traiani (20) municipium)	

In focusing on these development factors, I, of course, have no intention to devalue administrative status as a significant aspect of urban development. In fact, there is no question that a Roman *colonia* or *municipium* also was an urban settlement. There should, however, also be no question that a settlement without administrative status might just as likely have been urban due to the significance it gained through its development factors or its role in inter-settlement communication networks. Granting administrative status to settlements had only been a single event in a settlement's history, which, in the case of Moesia, often only happened after the respective settlement had already existed for several generations and had developed an economic and social environment suitable for urban growth and urbanization. Moreover, there were diverse reasons for an official granting of administrative status to a settlement, which were clearly guided by both global and local circumstances and agendas. The development factors for settlement and agglomeration as defined above, however, were clearly factors that promoted the significance of settlements irrespective of their status and that made them, in some way, central, not only as a point of attraction to their direct environment but also in terms of regional networks. Hence, I define urbanity as a dynamic mixture of social practice [20] and centrality, and argue that urbanity does not necessarily equal urbanization [21]. In contrast, there had clearly been different levels and scales of urbanization in Moesia that not necessarily decided which sites were urban. This was, in fact, done by the decisive development factors of military presence, special imperial beneficence, and mining, which made settlements socially and economically attractive and, thus, central. Hence, in Moesia urbanism is very much linked to centrality as an integral part of urbanity and a major factor for urbanization. Accordingly, I argue that brainstorming Christaller's central place theory may help to define urban settlement in Moesia, and I shall demonstrate this by discussing the site of *Timacum Minus*, which was one of the settlements of Moesia without administrative status.

3. *Timacum Minus*

3.1. *The Geography and History of Timacum Minus*

Timacum Minus lay in the hinterland of the Danube Limes amidst the valley of the Timok River in today's north-eastern part of Serbia (Figure 1: no. 5). The Timok valley was one of the earliest, 1st century AD lines of Roman approach from Macedonia, which at that point was already institutionalized as provincial territory, into Moesia and towards the Danube [22]. In fact, the river valley provided the only direct route from the south west of the *Stara Planina* to the Danube east of the Iron Gates. As the Iron Gates were only made passable for river transport during the reign of Trajan, this route was clearly significant for military and general transport purposes during the 1st century AD. Accordingly, an interregional road passing the Timok valley had already been installed during the 1st century AD to serve military and transport purposes [23], [24] (pp. 7–23), [25] (pp. 97–118). Eastern Serbia is generally characterized by mountainous and inaccessible terrain. The area towards the modern Serbian-Bulgarian border, which is marked by the Timok valley, is enclosed by the western foothills of the *Stara Planina* to the east and the *Homoljska Planina* to the west. Bordered by these mountain ranges, the Timok River had various tributaries, which defined the landscape of the Timok valley. Accordingly, the Timok comprises the *Trgoviški Timok*, the *Svrlijski Timok*, the *Beli Timok*, the *Crni Timok*, and the *Veliki Timok*. The *Trgoviški Timok*, which originates in the western foothills of the *Stara Planina*, and the *Svrlijski Timok*, which starts north of the village of *Prekonoga* near *Svrlijig*, meet in *Knjaževac* some 10 km south of the site of *Timacum Minus* to form the *Beli Timok*. At *Timacum Minus*, the terrain opens up towards the east, which in Roman times provided the possibility to lead the Timok valley road eastwards towards the Danube settlement of *Ratiaria* near today's *Vidin* in Bulgaria. From *Timacum Minus*, however, the *Beli Timok* continues north towards the modern town of *Zaječar*, where it meets the *Crni Timok*, which originates near *Krivi Vir* about 30 km east of the *Morava*. From this confluence of *Beli* and *Crni Timok*, the river continues as the *Veliki Timok* to eventually flow into the Danube between the Iron Gates and *Ratiaria*. This extraordinary fluvial landscape offered great connective potential. The Timok tributaries opened the enclosed Timok valley in different directions.

First, the connection of the Crni Timok to the west provided a link to the Morava, which was the major north-south fluvial traffic axis of Moesia Superior during the Principate. The levelled terrain at the confluence of the Trgoviški and Svrljiški Timok and at Timacum Minus provided connections to Ratiaria and further along the Danube Limes road east of the Iron Gates and to Thracian Serdica via Montana at today's Mihajlovgrad/Montana. Apart from the fluvial network, the road through the Timok valley clearly was of great significance, as it connected Naissus at the southern end of the Timok valley with Ratiaria and, thus, the Adriatic with the Danube. This allowed for the creation of a dynamic, interconnected traffic network, whose various lines of communication coalesced in Timacum Minus (Figure 2).



Figure 2. The Beli Timok at Timacum Minus (photo by L. Diers).

Due to these extraordinary locational properties, the site of Timacum Minus was already occupied during the 1st century AD. Here, legio V Macedonica and IV Scythica presumably erected temporary camps at Timacum Minus on their way to the Danube [22], [26] (p. 51), [27] (pp. 142–144). During the reign of Vespasian, however, military presence in Timacum Minus became more permanent: A road station was installed along the Naissus–Ratiaria military road through the Timok valley, and it was accompanied by a small auxiliary fort of cohorts I Thracum Syriaca [28] (pp. 44, 88–90). To facilitate traffic along the Timok valley road, two further road stations developed at this time and they were situated at Timacum Maius near today's village of Niševac and Conbustica at modern Kladorup [25] (pp. 97–118). Given the location of these road stations and their distance from one another, the route from Naissus to Ratiaria could have been travelled in several, convenient day-trips. After this initial occupational phase, Timacum Minus developed further in the 2nd century AD. The vast mountain ranges that enclose the Timok valley from all sides held rich mineral deposits, which made the region even more appealing to the Roman state. From Trajanic times onwards, a large fiscal mining district developed around Timacum Minus and throughout the 2nd century AD [29–31], [32] (p. 197), [33] (p. 31), [34,35], the exploitation of mineral resources gradually increased its economic potential. This also had effects on Timacum Minus. During the reign of Marcus Aurelius, the newly founded cohorts II Aurelia Dardanorum was transferred to Timacum Minus and replaced cohorts I Thracum Syriaca [16]

(pp. 123, 170), [28] (pp. 44–45, 66–67, 73–77, 82–85), [36] (p. 514). This coincided with the initial erection of a first, permanent stone-built auxiliary camp. Both the shift of military units and the erection of a stone camp in Timacum Minus were aimed at the protection and maintenance of the Timok valley road, the newly opened mines in the surroundings, and the road and river transport of mining commodities. In both contextual and spatial relation to the auxiliary camp, a civilian settlement developed at Timacum Minus. To date, it has not become clear whether this settlement already existed in the 1st century AD or only developed after the onset of mining in the vicinity and the deployment of cohorts II Aurelia Dardanorum. What is clear, however, is that due to the traffic significance of the site and the mining industry in its hinterland, both the military camp and the civilian settlement of Timacum Minus remained occupied throughout the Principate, the late Roman period, and up until the early 6th century AD [36] (p. 518).

3.2. Roman Mining in the Timok Valley

The mountains towering to both west and east of the Timok valley from its beginning at Trgovište to Timacum Minus and further north formed an enclosed mining landscape from the beginning or middle of the 2nd century AD onwards [29–31], [32] (p. 197), [33] (p. 31), [34,35]. Especially in the Svrlijska and southern Homoljska Planina to the west of the Timok valley and on the western fringes of the Stara Planina to its east, Roman mining activity has been detected at several sites. Judging from these sites and their distribution, the areas east and southeast of Timacum Minus appear to have been the center of the mining district. Here, various archaeological surveys revealed scattered finds of slags, tools, and structures for ore processing. Such finds have, for example, been made near the modern villages of Aldinac, Repušnica, Gradište, Žukovac, Kalna, Donja Kamenica, Balta Berilovac, Pričevac, Staro Korito, and Dejanovac. To the west of Timacum Minus, towards the Rtanj and Ozren mountains north of the Timok valley, the same types of finds have been encountered at the sites of Bukova Glava, Crni Vrh, Bučje, Dobro Polje, Ilino, Boljevac, Valakonje, and Orešac [28] (p. 20), [32] (pp. 195–196), [37] (pp. 127, 130), [38] (p. 192), [39] (pp. 55–56, 77, 82–83, 85, 165, 177, 185, 203, 217). Some of these sites did not only reveal evidence of ore processing but also protective installations like small fortifications or watchtowers (e.g., in Gradište, Dejanovac, Orešac), which safeguarded both the mines and the transport of their commodities [32] (p. 200), [39] (pp. 85, 165). Yet, all sites related to mining in the Timok valley were only identified by basic terrain surveys. The mines, the associated facilities and buildings, and the finds scattered on-site have not been published in detail to date. Large-scale archaeometric analyses of the slag finds have also not yet been conducted. Accordingly, the archaeological evidence for mining is of fragmentary nature and an exact dating of single mining sites in the Timok valley is not possible at the current state of research. Accordingly, it has also not yet become explicitly clear how exactly the mining activities in the Timok valley may be put in a chronological order.

Despite this problem, there is no doubt that the mining activities in and around the Timok valley had a close relationship with Timacum Minus. In fact, several inscriptions found around the site, which name administrative offices related to a centralized organization of the mining, demonstrate that the mining in the Timok valley was controlled from Timacum Minus. The most crucial of these inscriptions surely is IMS III/2, 31, as it names both an active soldier who also served as a librarius for mining matters in Timacum Minus and the office of a praefectus territorii, which clearly also refers to mining [28] (pp. 83–84). Thus, the inscription not only confirms entangled military and civilian involvement in mining business but also hints at the existence of a delineated, probably fiscal mining territory, which stood under the supervision of a praefectus who operated from Timacum Minus. Although the epigraphic and archaeological evidence from the Timok valley and its surroundings has by far not been able to identify the exact extent and administrative character of this mining territory, it is clear that Timacum Minus played a central role in all organizational matters of the regional, imperial economic ventures.

3.3. The Settlement of Timacum Minus—Archaeological and Epigraphic Evidence

The site of Timacum Minus comprises the military camp of cohorts I Thracum Syriaca and cohorts II Aurelia Dardanorum, a civilian settlement around this military camp, the necropolises of both settlement spaces, and several features in the direct hinterland of the site (Figure 3). The area of the camp, the civilian settlement, and the necropolises lie in flat terrain, which slopes gradually towards the surrounding mountains, for example, the hills of Slog and Podina, in the west, northwest, and southwest. To the east and north, the site is bordered by the course of the Beli Timok, which makes a turn at the northern end of the site to enclose the settlement space of Timacum Minus. To the northwest of the camp, the settlement and necropolis area is cut by a small river, the Ropinski brook. The overall settlement area, which is enclosed by these landscape markers, today lies on privately owned farmland, which stretches to the west towards the surrounding hills and mountains and to the south towards the fringes of the modern village of Ravna. Both the private ownership of the settlement area and its extensive agricultural use have complicated archaeological research onsite in the past decades. Accordingly, the only preserved feature of the site of Timacum Minus is the military camp, which is still visible in the terrain today and has partially been conserved.

The earliest military camp of Timacum Minus, which was related to the garrison of cohorts I Thracum Syriaca during the reign of Vespasian, was a timber construction. It has only been partially identified by small sections of palisades supported by square timber towers in the area of the camp's western gate. In addition, a defensive ditch dating from the mid-/late 1st century AD was located along the camp's eastern side [28,36,40], [39] (p. 184), [41] (p. 13). Due to the confirmation of parts of this early timber camp construction at both the east and west side, its size has been narrowed down to 1.7 hectares. The erection of a stone camp in Timacum Minus, then, correlated with the installation and deployment of cohorts II Aurelia Dardanorum during the reign of Marcus Aurelius, most probably in AD 169. For this developed stone form of the Timacum Minus camp, three major building phases have been confirmed by archaeological research since 1975. Phase I comprises the initial erection of the stone camp as related to the initial encampment of cohorts II Aurelia Dardanorum in the second half of the 2nd century AD. While the rounded towers on all four corners and the towers at the western and eastern gates already belong to this first construction period, further towers, which slightly protrude from the camp's northern, southern, and western walls to both in- and outside of the camp walls, have been assigned to a second building phase. The dating of this phase can only be narrowed down very generally, as the numerous grave stelae and dedicatory inscriptions from the surrounding civilian settlement, which were used as building material for the camp's rearrangement and tower construction, provide an overall terminus post quem of the mid-3rd century AD. Finally, the third phase displays reconstructions of the camp walls and enlargement of both angle and side towers sometime after phase II after the mid-3rd, probably during the 4th century AD [17,28,36,37,40]. In all three phases, however, the size of the stone camp of Timacum Minus resembled the early timber construction's 1.7 hectares. The camp's interior has only been investigated superficially so far (Figure 4). Apart from the major streets connecting the east and west gate and leading into the camp from the south towards its north wall [28] (p. 41), [42] (p. 275), a large building in the very middle of the camp has been excavated and addressed as a horreum [28] (pp. 50, 91–92), [36]. In addition, it is assumed that a Mars temple existed inside the camp. This assumption rests on several finds of dedicatory inscriptions to Mars, which were made both in the secondary contexts of the stone camp walls and throughout the village of Ravna and its surrounding farmland, but has not yet been confirmed archaeologically [28] (p. 42), [40] (pp. 53, 56), [41] (p. 17). Nevertheless, a remarkable feature was identified inside the camp's south-western wall. Here, a round structure unsuitable for dwelling or simple storage purposes was excavated. Various finds of slag inside and around the structure suggest that this was a type of ore processing facility [28] (p. 42), [32] (pp. 197–198), which directly links the site of Timacum Minus to the mining activity in its surroundings and may provide insights into systems of raw material transport, processing, and storage, as well as the involvement of the military in Timacum Minus in the regional mining industry.

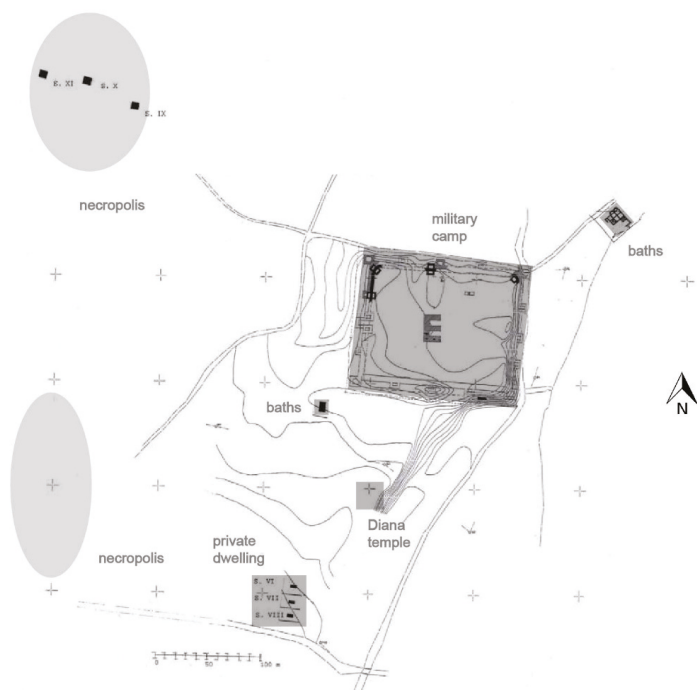


Figure 3. Overview of Timacum Minus (adapted from Petković and Ilijić, 2012, [43]).



Figure 4. View from inside the military camp (horreum) towards the hill of Slog to the west of Timacum Minus (photo by L. Diers).

Due to the site conditions of Timacum Minus and Ravna as outlined above, the civilian settlement accompanying the military camp has only been investigated superficially so far. Nevertheless,

the investigations onsite have generally confirmed the existence of this civilian settlement both to the north and south of the camp due to the identification of several buildings in these areas. First, sondages approximately 100 m south of the southern camp wall unearthed building remains, which date from the 2nd–3rd century AD. According to dedicatory inscriptions to Diana, which have been discovered in the direct vicinity, this building has been referred to as a Diana sanctuary [28] (pp. 42, 63–65, 71). Secondly, investigations 200–250 m southwest of the southern camp wall confirmed a structure from the late 3rd–4th century AD, which has been addressed as a private estate by the excavators [43] (pp. 153–178). Yet, layers underneath this building also attest to an inhabitation of the area in the 2nd–3rd and even in the 1st century AD already [43] (pp. 158–160, 168, 171). A third structure, which proved the civilian settlement’s extent to the military camp’s south, is the so-called south-western bath complex: Directly southwest of the south-western camp angle, a small structure has been partially investigated and, due to its hypocaust heating system and water pipes, addressed as a small bath complex [28] (pp. 40, 42), [41] (pp. 16–17). To the other, northern side of the camp, two structures indicate the spread and size of the Timacum Minus settlement. Around 100 m northeast of the camp’s north-eastern corner, directly at the Beli Timok’s left bank, a second bath complex was excavated (Figure 5). These northern baths consist of a large apodyterium, a central tepidarium, and various small niched rooms serving as caldaria and frigidaria and have been roughly dated to the 2nd–4th century AD [28] (pp. 40, 42), [37] (p. 123), [41] (pp. 16–17), [44] (p. 19), [45] (pp. 30–31). Furthermore, a mithraeum presumably existed north of the camp based on early finds of Mithraistic dedicatory inscriptions [28] (pp. 40, 42, 68–70). Archaeological investigations on the assumed spot of this Mithraeum have, however, not been conducted to date. Still, the north-eastern as well as the supposed south-western baths and the earliest occupation layers some 200 m southwest of the latter well attest to the settlement’s spatial extent around the camp throughout the Principate.



Figure 5. View from the western side of the north-eastern angle tower of the military camp of Timacum Minus—the area of the northern baths at the Beli Timok in the background (photo by L. Diers).

The civilian settlement of Timacum Minus is further delineated by its necropolises. Remains of burial grounds were found at several sites around Timacum Minus but especially to the west,

southwest, and northwest of the military camp and settlement (Figures 3 and 6). Accordingly, agglomerations of graves have so far been investigated on the eastern slope of the Slog hill around 300 m southwest of the south-western camp corner, on the left bank of the Ropinski brook to the northwest of the camp, and between the Slog hill and the camp on the fields of Širina [28] (p. 42), [46]. Most of these graves, however, date from the 4th–5th century AD only. Single burials at all the mentioned sites also belong to the 1st–3rd century AD phases of the site [41] (p. 142); yet, this can only generally confirm that burial grounds were already in existence during the Principate. In fact, the reuse of grave stelae from the 1st–3rd century AD in the reconstruction works of the military camp in its phases II and III dislocated significant markers for the location and spread of the Principate-times burial grounds.



Figure 6. View from the military camp to the west and southwest: Civilian settlement and necropolises (photo by L. Diers).

Apart from the military camp and the actual settlement of Timacum Minus with its necropolises, three structures in the direct hinterland of the site further characterize the settlement and the outline of its relationship to mining activities in the wider vicinity. Firstly, a temple structure, which has been preliminarily dated to the 3rd century AD, was discovered underneath a church on the Sveta Trojica hill west of Timacum Minus and between today's Ravna and the neighboring village of Debelica [47] (p. 161). An inscription found onsite names the erection of a temple and, thus, confirms the identification of the building (IMS III/2, 99) [16] (p. 110), [28] (pp. 39, 43). Moreover, the inscription is of further significance, as it also names the donor of the temple, Cassius Achilleus. This name indicates that the temple had been commissioned by a freedman. Due to various finds of marble dedicatory slabs related to the Thracian rider and Jupiter, the temple is generally assigned to these deities. Clearly, there is no doubt that the temple at Sveta Trojica spatially and contextually belonged to Timacum Minus and was used by inhabitants of both camp and settlement. Secondly, the 19th century Balkan traveler Felix Kanitz reported of remains of a bridge over the Beli Timok north of the Timacum Minus military camp [44] (p. 19). Although it is not clear whether this bridge really was a Roman construction, it is likely that a river crossing facility was installed already during the Principate, as it

would have greatly facilitated transport from the eastern mining areas around Timacum Minus and interregional traffic through the Timok valley. Eventually, a third interesting structure was identified on the hill of Podina to the northwest of Timacum Minus and north of the Slog hill. Here, traces of a small late antique fortification were found [48]. Although there are no hints at an earlier occupation of the site yet, it is likely that a watchtower or small fortification had already existed during the Principate, as such a structure would have overlooked the site of Timacum Minus as well as the Beli Timok and the fluvial plain around the site in general and, thus, would have safeguarded the transport of mining commodities and general traffic.

Although the date of Timacum Minus' initial emergence is not clearly indicated by the few archaeological features identified onsite, preliminary hints at the development of the site exist. The earliest layers underneath the private estate structure show that any kind of settlement activity around the earliest military camp already existed in the 1st century AD. Yet, there is a clear chronological emphasis of construction works on the 2nd and 3rd century AD, which indicates that large-scale settlement and urbanization processes in Timacum Minus were only set in motion after the onset of large-scale imperial mining ventures and the deployment of cohorts II Aurelia Dardanorum. In terms of the size and extent of the settlement, the lack of archaeological data from the Principate-times burial grounds of Timacum Minus complicates an exact estimate. The location of the 4th–5th century AD necropolises, as well as the single Principate-times graves underneath them, however, generally limit the settlement territory to the west, northwest, and southwest, while in the east and north, the Beli Timok delineates the settlement space (Figure 3). In this way, the settlement of Timacum Minus can be narrowed down to an approximate size of 30 hectares, which is, for example, comparable to the mining site of so-called Municipium DD in southern Moesia Superior, today's northern Kosovo, which also did not have administrative status and mostly developed throughout the 2nd century AD [49].

3.4. Administration and Centrality—Timacum Minus and Its Regional Context

Assessing the character and status of the settlement has been one of the main foci and problems of research on Timacum Minus. While Sofija Petković calls Timacum Minus a “fortified administrative centre of the Upper Moesia mining region of the *territoria metallorum*” and an “urban settlement with public baths, villas, workshops, and temples” [46] (p. 87), Miroslava Mirković has addressed it as one of the “non-urban” settlements of Moesia [17] (p. 68–71). The central issue of the debate, which becomes apparent in these quotes, lies in the fact that there is no evidence—whether epigraphic or archaeological—for Timacum Minus' status. Given the high number of inscriptions found onsite, it is indeed highly likely that the lack of municipal or general official administrative references to the status of the settlement provides a representative picture. Andras Mócsy has therefore argued that Timacum Minus surely was no *municipium* and, thus, no regional centre [16] (p. 110), [26] (p. 225). However, these two statements really do not have to follow from each other. Petar Petrović remarked that the lack of a *municipium* in such a large and important region as the Timok valley indeed seemed astonishing [28] (p. 35). Hence, he opened a debate centered on a fragmentary inscription (IMS III/2, 26), which was found in a secondary use as building material for the phase II and III military camp walls of Timacum Minus and which names a *decurio* of a *municipium* [28] (pp. 79–80). Due to this inscription, Petrović did not want to completely eliminate the possibility that a so far unknown *municipium* existed at Timacum Minus. Still, he opted for an identification of the IMS III/2, 26-*municipium* with nearby Naissus or Viminacium [28] (p. 79). As the inscription is fragmentary only, it is very likely that it indeed named a *decurio* of one of these municipal settlements, who after his service came to live and/or be buried at Timacum Minus.

As the existence of a *municipium* in Timacum Minus can, thus, be eliminated, the settlement around the camp of cohorts II Aurelia Dardanorum is commonly addressed as a *vicus metalli* [28] (p. 37), [31] (pp. 257–259). This characterization of Timacum Minus is further supported by comparing it to other mining settlements in Moesia. The mining territories of central Dardania around the

settlements of Ulpiana and so-called Municipium DD in today's Kosovo had indeed been put under municipal administration and supervision. Yet, this did not result from the mining *per se*. Instead, it concerned the overall territorial administration of Roman settlement in the wider region of Dardania. So-called Municipium DD displays a similar situation as Timacum Minus. Large-scale imperial mining activities in the surroundings of the settlement started in the 2nd century AD, and inscriptions attest to administrative offices organizing this mining from Municipium DD [49]. Although it is perceived as a municipium, the settlement did not receive municipal rights but remained a *vicus metalli* with a centralized mining administration [19]. Nearby Ulpiana, which also developed due to the installation of an enclosed mining territory in its surroundings in the 2nd century AD, however, was granted municipal status shortly after its emergence. Yet, this needs to not be viewed in the context of the mining district and its administration; instead, it resulted from the lack of settlements and administrative bodies concerned with the overall administrative organization of the wider region of central Dardania [19]. In Timacum Minus, however, it seems that larger administrative bodies in the wider vicinity (the municipium of Naissus, the *colonia* of Ratiaria, and *legio VII Claudia* in Viminacium, which, together with its vexillations, governed a large area extending along the Danube Limes towards the Iron Gates and into the hinterland of the Danube Limes in terms of military territory) were enough to cater for local needs in efficient ways. In central Dardania such structures were not present in the vicinity, resulting in the creation of a regional center with municipal rights in Ulpiana. Here, an additional aspect to consider in terms of municipal rights granting in Moesia and its reasons is military recruitment. As the present evidence does not hint at a considerably dense pre-Roman and Principate-times indigenous inhabitation of the Timok valley [50], recruitment in the area might not have been a major aspect to facilitate. Moreover, it should also be taken into consideration that, given the lacking need for encompassing administration in the Timok valley, the fiscal character of the mining district around Timacum Minus might have been a reason for disabling a certain organizational autonomy in the settlement. Regarding the fiscal character of the mining district in the Timok valley, it is also interesting that the epigraphic record of Timacum Minus displays a relatively high number of Greek names [16] (p. 124), [28] (p. 46). On one hand, this might have resulted from the recruitment of cohorts II Aurelia Dardanorum in Macedonia and Dardania. On the other hand, it might also be traced back to the imperial character of the mining territories around the settlement, which most probably resulted in the presence of imperial freedmen taking positions in the mining administration [28] (p. 47). This also fits the building inscription of the temple on the Sveta Trojica hill, which names a freedman as the temple donor. The mining industry and its administration obviously held certain economic and social potential for freedmen, which in general turned mining settlements into attractive agglomerative nodes and socially and economically appealing centers [19].

An interesting aspect to consider when thinking about the emergence and development of such a mining center in Timacum Minus clearly is its relationship with the other Roman settlements in the Timok valley. The *Tabula Peutingeriana* names Timacum Maius, Timacum Minus, and Conbustica as stations along the way from Naissus to Ratiaria [28] (pp. 23–30). Conbustica lies at the Bulgarian village of Kladorup, and Timacum Maius has only recently been identified at the site of Kalnica between the villages of Svrljig and Niševac in the southern Timok valley. At both Timacum Maius and Conbustica, military garrisons and civilian settlements with public facilities like baths and temples/shrines have been uncovered beside the road station [25,51–55]. Accordingly, both sites do not appear to be strikingly different from Timacum Minus. Yet, they were, and the aspect that differentiates Timacum Maius and Conbustica from Timacum Minus clearly is centrality, both in locational and in hierarchical terms. The distances from Naissus to Timacum Maius, Timacum Maius to Timacum Minus, Timacum Minus to Conbustica, and Conbustica to Ratiaria all range around 30–40 km. This allowed for convenient stages of a day's journey when travelling the Timok valley road. Rapid military marches or travels in carriages or on horseback may have made it possible to pass Timacum Maius and Conbustica. Timacum Minus, however, always needed to be stopped at, as it was clearly not possible to travel the Naissus–Ratiaria road in one trip only. In addition, the mining administration and its economic, financial, and social

prospects for office holders and investors of any kind clearly condensed in Timacum Minus, which would have made the settlement more attractive for settlers and turned it into a regional center.

4. Timacum Minus as a Central Place and Urban Mining Site

In Roman urbanism, one of the basic conditions for towns has always been centrality [6] (p. 83). According to the economic function of towns as either consumers and/or market vessels [56,57], the principles of territorial administration, and the specific relationship between settlement and hinterland in the Roman Empire in general, Roman towns somehow always were central places. A certain amount of centrality is, thus, immanent to Roman settlement and urbanism. This is a very specific trait of ancient settlement patterns, and it may have contributed to the problems of grasping Roman urbanism beyond the consumer city, beyond center-periphery models, and beyond idealistic perceptions of urban evolution. Timacum Minus is a vibrant example of how to go beyond these aspects and basic central place theory, as it displays different levels of centrality. First, the settlement was geographically central, not only to its direct environment but also in simple, locational terms. Timacum Minus lay just amidst the Timok valley and the Timok valley road and at the spot where the fluvial landscape of the Timok tributaries coalesced. Although it is clear that centers do not necessarily relate to geographical or geometrical aspects, Timacum Minus may be viewed as the prime example for the ‘law of location’, as one might paraphrase Christaller’s intention to search for logic patterns in site and settlement location [1] (p. 13). The settlement of Timacum Minus developed at its specific site because this site had a central location, where—given the local and regional circumstances during the Roman Principate, which especially becomes apparent in the Timok valley road and its landscape characteristics—a settlement actually had to emerge. The 1st century AD Timok valley road, which connected Naissus and Ratiaria and, thus, theoretically also the Adriatic, southern Moesia Superior, and western Moesia Inferior with the Danube, created a regional micro-landscape of centrality of its own. This landscape coalesced in Timacum Minus as a military post and settlement, which guarded private, political, economic, and military traffic along the Naissus–Ratiaria road together with Timacum Maius and Conbustica. According to these characteristics, one may call Timacum Minus a ‘bridge’ in the sense of Mark Granovetter [58] (p. 1364), [59]. In another way, this principle of site location has also been formulated by August Lösch. He stated that location and locational factors are mostly geographical facts. Yet, he also stated that what was made of these conditions in a specific regional and/or chronological context was open to be guided by different development factors [60] (p. 5). This is also very true for Timacum Minus. Despite the locational centrality, which resulted from the geographical and historical conditions of the Timok valley, the settlement also displays a second, much more crucial form of centrality—a hierarchical centrality. The natural resources the Timok valley and its surroundings offered and the large-scale mining industry, which was installed on the base of a fiscal mining district in the 2nd century AD, turned Timacum Minus into a regional center. Again, the site’s central location amidst the Timok valley most probably was the primary factor for installing the Roman administrative bodies of the mining district just in Timacum Minus; yet, the organizational primacy of the site clearly made it hierarchically central in the time to follow. This trait is also the primary factor, which differentiates Timacum Minus from the other sites along the Naissus–Ratiaria road. Timacum Minus had characteristics Timacum Maius and Conbustica had not, and these characteristics were decisive for its urban development. Most importantly, however, both the locational and the hierarchical centrality of Timacum Minus were very much guided by local and regional conditions.

The significance of this also becomes apparent when looking at the *longue durée*. Evidence for mining in the Timok valley has also been found for the pre-Roman Iron Age and Late Antiquity; yet, the Timok valley in general was not densely settled during these periods. Timacum Minus itself only revealed singular scattered finds of pre-Roman material [50] (pp. 88–91, 134, 156–157), and the site was eventually abandoned in the 6th century AD. Today, the regional centers of eastern Serbia have moved to Knjaževac and Zaječar, and the village of Ravna merely has 300 inhabitants. In fact, mining is still

conducted today but the mining centers now lie in Bor and Majdanpek north of the Timok valley [38]. Hence, the very specific historical, economic, and transport-related circumstances Timacum Minus was embedded in during the Roman Principate also created very specific conditions for site development, which have not reoccurred until today. Such temporarily singular developments surely speak for Timacum Minus as a regional center during the Roman Principate.

Timacum Minus' character as a regional center only during the Roman and late Roman period also speaks for its character as an urban settlement. Although the settlement was not distinctly large, did not have administrative status, and also did not have distinct potential for urban growth and monumentality as is indicated by its necropolises, which limit the settlement space, it clearly had urban character acted out on the levels of social practice and centrality. Timacum Minus had public buildings, which were partly privately funded by people who gained their economic and social status through the mining industry, and also was the only larger settlement in the wider region. Thus, it is the urban significance, which makes Timacum Minus stand out of the compound of Timok valley road stations, and this urban significance—again—resulted from the settlement's centralized administration and the economic and social potential the mining offered. This is, for example, made very clear by the development outline of the settlement: Although Timacum Minus already existed from Vespasian's reign onwards, all the archaeologically determined public buildings of Timacum Minus date from the mid-2nd–3rd century AD and, thus, only were erected after the mining industry and administration had been solidified in the Timok valley and Timacum Minus [19]. Problematically, the site conditions of Timacum Minus and the fragmentary state of archaeological research on the settlement and its surrounding mining sites so far hinder large-scale investigations of economic systems, the range of production and transport networks, the flow of people related to these networks, and—eventually—the relationship of all these aspects to the settlement of Timacum Minus. Still, it is very clear that, due to the mining, Timacum Minus had a specific relevance for regional and global markets and I argue that this had impact on local and regional urbanism. Timacum Minus shows that scale is not necessarily important, and that centrality does not necessarily relate to mathematic values. In fact, urbanism and centrality are both means of intensity and relation. In order to assess urbanity and urbanization, settlements should not only be quantified; instead, they should indeed be qualified. The qualifiers of urbanism in a local context, however, are not primarily administrative status and monumentality but centrality, which stems from geographical location and economic locational factors that, in turn, generate social agglomeration. Hence, one may say that Timacum Minus was a central place due to its embedment into a central landscape and a nucleated community in a sparsely settled area with a centralized regional administration, which is what eventually turned the site into an urban settlement of Roman Moesia.

5. Conclusions

The main objective of this paper was to question traditional approaches to urbanism. Accordingly, the paper aimed to show that predominant perceptions about urbanism are not suitable for the Roman province of Moesia and that brainstorming central place theory and centrality mechanisms can help not only to understand this but also to provide a different framework for the identification and characterization of urbanism and settlement patterns. When working on urban settlement in the Roman Empire, the most significant aspects to consider are systems of attractions and the energy and dynamics of settlement [61]. The ideology of urban form, which has long been questioned but is still used as a condition of Roman urbanism does not fit the reality of settlement dynamics throughout the Empire in general and in Moesia specifically. Urbanism studies, however, should not focus on implementing idealistic and idealized categorizations, but instead understand agglomeration. I argue that focusing on development factors for a settlement instead of administrative status and monumentality as the main trait of an urban site indeed facilitates the characterization of Roman urbanism and its development on local and regional levels. Centrality patterns and mechanisms as a result of these development factors, which go beyond the notion that settlements were central to

their hinterland, further help to understand not only initial agglomeration but also the development of agglomeration. The principle of ‘centralities’, which I introduced in this paper using the mining settlement of Timacum Minus as a case study, clearly shows that in order to properly assess urbanity and urbanization in Moesia, the status of a site takes a back seat in favor of the decisive factors that made it become a site.

Although Christaller was in many ways too static with his central place theory and it has long become clear that central places need not be urban settlements, considering applications of central place theory on a theoretical level still is crucial for the settlement patterns of Moesia. Christaller explicitly stated that he did not intend to introduce a new definition of ‘the urban’ with his central place theory as this would lead to “considerable confusion” [1] (p. 25). I, however, want to do just that, and argue that using centrality as a criterion for urbanity and a condition for urbanization dissolves confusion about urbanism in Moesia rather than creates it.

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Article

Transforming Culture on an Insula Portunalis: Port Cities as Central Places in Early Roman Cyprus

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Abstract: During the Early Roman period in the Mediterranean (ca. 30 BC–330 AD), the key central places that distinguished socio-political landscapes were towns. These urban centers functioned as economic and administrative focal points that were controlled by local elites who oversaw wealth redistribution and maintained a dialectical relationship with Rome that mutually benefited both parties. Yet, beyond providing such rudimentary observations, central place theory has recently been revised to examine how local factors, such as a place’s long-term geography and history, intersect with globalizing ones to transform settlement hierarchies as well as economic, political, and cultural landscapes. This article’s goal is to explore such intersections through a study of how port towns functioned as central places that connected globalized imperial networks to localized provincial ones within island contexts. It examines a range of material culture including, ceramics, architecture, prestige goods, and coinage from ports in Early Roman Cyprus in order to investigate how the island’s integration into Roman networks created central places that altered existing settlement types, hierarchies, and thus, local identities. Overall, this study shows how the reanalysis of central places within their unique geohistorical contexts can shed new light on both regional and state-level processes of cultural change.

Keywords: Cyprus; Roman archaeology; Roman imperialism; island and coastal archaeology; identity; urbanism; central place theory; connectivity; maritime cultural landscapes

1. Introduction

Cyprum itidem insulam procul a continenti discretam et portuosam, inter municipia crebra urbes duae faciunt claram, Salamis et Paphus, altera Iovis delubris, altera Veneris templo insignis. Tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus, ut nullius externi indigens adminiculi, indigenis viribus, a fundamento ipso carinae ad supremos usque carbasos, aedificet onerariam navem, omnibusque armamentis instructam, mari committat.

Cyprus, too, an island far removed from the mainland, and abounding in harbours, besides having numerous towns, is made famous by two cities, Salamis and Paphos, the one celebrated for its shrines of Jupiter, the other for its temple of Venus. This Cyprus is so fertile and abounds in products of every kind, that without the need of any help from without, by its native resources alone it builds cargo ships from the very keel to the topmast sails, and equipping them completely entrusts them to the deep. [1] (p. 73)

This passage by the Roman era historian, Ammianus Marcellinus, represents one of the most commonly cited descriptions of ancient Cyprus found within historical and archaeological literature [2] (p. 139), [3] (p. 242). Its ubiquity is not surprising since the passage provides an epigrammatic encapsulation of the island’s political, economic, and religious landscapes that offers an effective *mise-en-scène* for the discussion of historical topics. Ammianus informs us that we are dealing

with a sea-girt island that is “portuosa,” or rich in harbors (Figure 1). He tells us that it “abounds in products” (*abundat rerum omnium*), which, besides those associated with its fertility (e.g., wine, olive oil, and grain), must include the timber and copper needed to build the cargo ships (*oneraria naves*) that ply the surrounding sea. We are further told that Cyprus is “crowded” (*crebra*) with towns (*municipia*), and that there are two cities (*urbes*), Salamis and Paphos, with celebrated shrines to the Greco-Roman gods, Zeus-Jupiter, and Aphrodite-Venus. In sum, the passage suggests that Roman Cyprus was economically prosperous because of its export products [2], that it was culturally unique based on its famous cults, and that it was thickly settled with two outstanding *urbes*—Salamis and Paphos—dominating a hierarchy of *municipia*. Moreover, Ammianus’ characterization of the island as an “*insula portuosa*” creates a coastal or maritime cognitive geography in which ports, via their links to the *oneraria naves* and the sea lanes they ply, form network nodes that straddle land and sea, and provide quasi-panoptic gateways to the wider Mediterranean world.



Figure 1. An “*insula portuosa*.” Inlets and bays along the coast of Cyprus looking towards Cape Akamas, the island’s farthest northwestern point. Photo by J.M. Gordon.

Although Ammianus’ text should be historically contextualized within the mid-fourth century AD, at a time when Salamis, now renamed Constantia, was the island’s capital city, and the Roman empire was ruled from Constantinople [4], the archaeological and literary evidence for Cyprus during the Early Roman period seems to paint a similar picture. From ca. 30 BC–300 AD, when Nea Paphos was its capital and Rome was the *caput mundi*, Cyprus seems to have been an economically self-sufficient and politically stable province [2,5]. The Early Roman archaeological and literary evidence appears largely congruent with Ammianus’ observations: ships plied the coastal waters, prestigious imported products (e.g., marble statues) could be acquired at ports, Nea Paphos and Salamis were the largest coastal centers and controlled the island’s main cults, and, according to writers like Strabo, Pliny the

Elder, and Galen, a wide range of natural resources were marshalled for export [2,6]. The archaeological remains from throughout the island also suggest that a new range of social identities were negotiated that were different than those of the preceding Hellenistic era [7]. As mentioned, prestige items like imported wine amphorae [8] and marble statues [9] have been found in the port cities, while in other parts of the island, those areas far away from busy sea lanes or distant from ports, traditional practices continued or settlement contracted [10] (p. 50), [11] (pp. 60–61). Cyprus' integration into the political and economic networks of the Roman empire thus had a significant impact on local reorientations of culture and societal development [12].

Another factor that shaped the transformation of Cypriot society during Early Roman times was the island's unique *longue durée* (or long-term) geographical and historical features. The analytical value of such features to historical inquiry is important to recognize, and their modern examination can be traced back to the pioneering approaches of the French *Annales* school, which are best represented in the works of Lucien Febvre [13] and especially, Fernand Braudel [14]. Braudel believed that the analysis of a specific region's long-term history could reveal certain "permanent values," which, although often difficult to discern within analyses of short-term events, could often play a significant role in shaping historical developments. His method involved making "full use of evidence, images, and landscapes dating from other periods, earlier and later and even from the present day," so that the "resulting picture is one in which all the evidence combines across time and space, to give us a history in slow motion from which permanent values can be detected" [14] (p. 23). Hence, if one extrapolates on Braudel's theory, a region's permanent values might include its geographical location, topography, and natural resources, as well as other more "historical" forms of cultural evidence, such as the long-term persistence of certain languages or religious practices—social relics that can be "fossilized" through material remains.

A study of cultural change in Cyprus, an island with evidence for at least 10,000 years of human habitation, should therefore involve not only the analysis of the short-term events that led to changes in economic or political power relations, but also an examination of how the island's long-term geographical, as well as cultural, features shaped society [15]. Yet, what is the broader analytical value of examining cultural change in Roman Cyprus from a Braudelian perspective? As could be argued with regard to its large and centrally-located sister provinces of Crete, Sicily, or Sardinia [5] (pp. 1295–1296), the long-term analysis of cultural change in Cyprus is particularly valuable (and especially from a Roman provincial studies perspective) because it sheds light on how people cultivate unique identities on islands (or notions of "insularity") that are different from those negotiated in continental settings [12]. Therefore, the fact that in antiquity, Cyprus was an island "far removed from the continent, and abounding in harbours" matters in terms of how we interpret its past and the cultural and social identities that its inhabitants negotiated with the wider world.

I have suggested elsewhere [12] that it was this permanent value, Cyprus' insularity, that made the island a culturally unique Roman province, one that could be at once connected, and isolated, from the rest of the Roman Mediterranean depending on the how its geographical and cultural features were negotiated by local, imperial, or even transient, social actors. In this article, I aim to further explore the influence of Cyprus' insularity on local culture by zeroing-in on those places where unique insular features arguably intersected with the social and economic currents of a wider imperial world, that is, Cyprus' port towns. Because complex and multi-directional interactions between islanders and non-islanders and local and imperial agents often occur within the liminal spaces of port cities [16] (pp. 51–52), such an approach also reveals how ports functioned as central places that fostered novel economic and cultural exchanges and catalyzed the transformation of Cyprus' broader social landscapes.

My goal then is to provide an archaeological case study of Early Roman Cyprus' port cities that sheds light on their function as central places within local, regional, and imperial networks, and how their positions within such multi-scalar webs of interaction led to both the disruption of traditional modes of insular life and the creation of uniquely Cypriot social identities. First, I consider the utility

of central place theory within the wider context of contemporary archaeological discourse and for understanding cultural change in Roman Cyprus. Second, I discuss how I conceive of maritime ports as unique types of central places, especially in island contexts, that facilitated political administration, stimulated economic growth, and permitted a wide range of cross and inter-cultural interactions, including the negotiation of new modes of self-representation. I also suggest that archaeologies of maritime cultural landscapes must be united with terrestrial archaeologies so as to offer a more rounded perspective on island life. Finally, I offer an archaeological case study of how social and economic practices were transformed within Cypriot ports during the Early Roman period. Through the examination of the geographical settings, as well as maritime and terrestrial remains from two first-rank ports, Salamis and Nea Paphos, I show how Rome's conquest of Cyprus integrated these central places into new multi-scalar economic and cultural networks that transformed settlement hierarchies and the ways Cypriot agents identified themselves.

2. Central Places in the Roman World

"A place where people interact, a focal point and terminal for commerce and trade involving problems also of geography, geology, history, and economics."

(Anna Marguerite McCann on ports) [17] (p. 11).

In his pioneering work, *Central Places in Southern Germany*, Walter Christaller developed the study of settlement geography, or *Siedlungsgeographie*, in order to address the socio-economic processes that affect settlement size, number, and distribution within a given spatial landscape [18] (p. 3). Key to this pursuit was a focus on central places, which have been succinctly defined by Martínez and Tejerizo as "primarily a settlement at the center of a region in which certain types of products and services are available to consumers" [19] (p. 82). The importance, or centrality, of these central places was further defined by Christaller as "the relative importance of place with regard to the region surrounding it, or the degree to which the town exercises central functions," [18] (p. 18) which include the presence of central goods and services (those that are offered or manufactured at a central place) as well as the professions that produce them. These goods and services are distributed to or accessed by the people who exist in a central place's complementary region [18] (pp. 21–22), which is the surrounding landscape of settlements that supports the central place or accesses its services in relation to economic distances based on diminishing returns (e.g., in relation to the time and cost associated with moving products from the regional site to the central place) [20] (p. 113). At this point, since we are dealing with an imperial state in this article, we might also add that a central place often attracts administrative functions and attendant places for ideological or religious practices [19] (pp. 84–85). Such elements might also serve as social magnets for people within a complementary region.

Because Christaller's central place theory is specifically concerned with how settlements come to be and how they influence each other within specific landscapes, it has also proven to have archaeological utility in terms of understanding the function of ancient settlements based on their material remains [19] (pp. 85–86), [21] (p. 212). Such applications of central place theory have been utilized by processualist survey archaeologists in particular [22] (p. 7), who have statistically examined remains from survey regions in order to organize and rank the sites or places of special interest indicated by surface finds and features. These studies have provided an important contribution to scholars' understanding of archaeological landscapes, especially in historical eras with high rates of economic activity and evident urbanism, such as the High Roman empire [23] (pp. 6–8). Yet, over the last twenty years, central place studies have been influenced by new epistemological stresses that reflect our own increasingly globalized world, such as: political and economic complexity and uncertainty, heightened connectivity, regional variability, and the role of human agency in negotiating these factors [24] (pp. 1–2). Perhaps the most notable exploration of these themes has been in Horden and Purcell's *The Corrupting Sea*, which has stressed the importance of micro-regional connectivity and economic dynamism within the context of the kaleidoscopic, geo-historical Mediterranean

longue-durée [25]. As a result, archaeologists have moved beyond the positivist discussion of sherd counts or static and cellular notions of economic interaction and have begun to examine the diverse ways that humans could establish central places and experience them [24,26] (pp. 5–9).

During the Roman period, the key central places were arguably towns. In their recent study of Late Antique Spain, Martínez and Tejerizo state that “towns can be seen as the main type of central places within their territory, dotted with villas, mansiones, and other minor rural entities that served as secondary nuclei, and formed the economic and political network from which imperial power was established and maintained” [19] (p. 83). The reason that Roman towns can be viewed from this sociological perspective is because of the types of archaeological evidence they leave behind, such as: a dense surface spread of material remains indicative of large populations, evidence of urban planning and transport infrastructure, evidence for trading connections over a range of distances, the presence of significant public and private buildings and monuments, and often, the presence of industrial or commercial establishments [19] (pp. 85–86). However, if the prototypical Roman *urbs* can be seen as key to the development of society in continental landscapes, can we utilize it in the same way to understand social change within a maritime or insular environment like Cyprus? I would argue that we can with certain qualifications that reflect the unique features of coastal settlements within a strongly interconnected pre-modern Mediterranean.

3. Ports as Central Places within Maritime Cultural Landscapes

The largest towns on the island of Cyprus during the Roman period were Nea Paphos [27] on the island’s west coast, and Salamis on the east [28,29] (Figure 2). These *urbs* (as well as most of Cyprus’ smaller *municipia*) mentioned in Ammianus Marcellinus’ famous passage cited above both share one key characteristic: they were located on the island’s coasts and served as ports [3] (pp. 227–229). When this observation is combined with the massive expansion of the ancient economy through seaborne trade and market exchange that occurred during the High Roman empire [30] (p. 39), it seems clear that an island city’s situation on a coast, especially if it invested in harbor facilities, could play a strategic role in transforming it into a central place where people could congregate for economic, political, and social purposes. Such forces were originally recognized by Christaller [18] (p. 16), who described harbors as “point-bound” central places whose location at the meeting of land and sea routes enhanced their centralizing power, an interpretation that continues to resonate today within island urbanization studies tempered by 21st century globalization theory. For example, Grydehøj et al. [31] (p. 5) suggest that:

One might imagine that globalisation would decrease the significance of the island cities on which these remote communities depend, but it has in fact reinforced the centrality of the old island cities: The more complex and resource-heavy the transport technology, the more important the island city’s hub and gateway functions relative to its periphery.

Such a view might also be applied to large Roman coastal cities with significant harbor installations, such as the Cypriot ports of Nea Paphos and Salamis. In fact, this comparison seems even more apt if one views the concept of globalization from a non-presentist perspective and posits, as several scholars currently do [32], that the early Roman imperial period represents a historically unique era of heightened connectivity. Although most of Cyprus’ principle ports had existed in pre-Roman times [33] (pp. 30, 37), the archaeological evidence for the expansion of maritime trade at port sites suggests that the island’s integration into the “globalized” Roman Mediterranean enhanced ports’ regional centrality and made them into the crucibles for multi-scalar, cross-network interactions [3,34].



Figure 2. Map of Cyprus showing significant Early Roman period sites. Note Nea Paphos on the west coast and Salmis on the east coast (marked by red stars). Map courtesy of Brandon Olson.

Yet such ports' centrality also marks them out as places that could be fundamentally different to inland island towns, which were located at a distance from the coast and were thus more disconnected from the greater maritime or "global" world. Such coastal/inland social and cultural differences might have been especially marked during pre-modern eras that lacked the telecommunications and transportation technologies we now take for granted, such as in Cyprus during the 19th century when mules were the primary vehicles for inter-city travelers [35]. However, even today, despite our technology, it is likely that most people who engage in an *anabasis* from a Mediterranean island harbor to a hinterland town will notice how the landscape and altitude, and with it, the perspective of its inhabitants, changes as one heads towards what seems, somewhat paradoxically, an internal frontier—a central region from which there is nowhere to go but back to the coast. In modern Cyprus, one might still experience this phenomenon traveling from the port of Larnaca to the farming villages of the Malloura Valley (an agriculturally fertile region situated in the island's Mesaoria plain; Figure 3), or traveling from the port of Limassol to the alpine villages of the central Troodos mountains. Fernand Braudel also noticed what he called "the historical poverty at the heart of all islands" in the mountains of Cyprus where "there stretched one of the most characteristic no-man's-lands of the Mediterranean, the refuge of the poor, bandits, and outlaws" [14] (p. 154). Hence, one phenomenon of the island port city might be that the more integrated into external networks it becomes, the more its connections to the hinterland and its way of life are altered. Given the lack of archaeological evidence for large-scale urban centers in the Cypriot hinterland during Roman times, it seems that port cities did take on a central role vis-à-vis their complementary regions and that such changes in settlement hierarchy led to different socio-cultural experiences.



Figure 3. View of the Cypriot hinterland. The valley of Malloura and its ancient sanctuary (center) in the Mesaoria region of Cyprus looking north to the Kyrenia mountain range. Photo by J.M. Gordon.

What kinds of features made ports unique central places in comparison to, say, hinterland market towns [14] (p. 145)? Gary Reger [36] has highlighted four structural features that are characteristic of large maritime ports, whether in antiquity or today: (1) they provide a locus for *mixing* diverse human agents, (2) they provide a *liminal space* that connects land and sea, (3) they provide *economic*—and I would add administrative—*institutions*, and (4) they are often networked hubs of *connectivity* in that they link people to places that are often far removed from the port itself. In his study, Reger focuses on Havana, Cuba in the 16th century as a bustling port with all of these features; however, it is easy to imagine many Mediterranean ports of call fitting such a *typologie des escales*, such as Valencia, Palermo, Herakleion, Piraeus, Port Said, or Limassol.

One can gain a sense of the bustling and cosmopolitan activity experienced in such ports through Jules Verne’s fictional description of 19th century Suez, Egypt—a gateway to the Mediterranean world—in *Around the World in Eighty Days*:

Little by little the scene on the quay became more animated; sailors of various nations, merchants, ship-brokers, porters, fellahs, bustled to and fro as if the steamer were immediately expected. The weather was clear, and slightly chilly. The minarets of the town loomed above the houses in the pale rays of the sun. A jetty pier, some two thousand yards along, extended into the roadstead. A number of fishing-smacks and coasting boats, some retaining the fantastic fashion of ancient galleys, were discernible on the Red Sea. [37] (p. 37)

Ports, as “sailor towns” [36] (p. 14), thus exude a bustling and cosmopolitan aura that betrays their mixed populations, their locus as liminal spaces, their economic potentialities, and their connections, especially to external locales. In this imagined Suez, we encounter a liminal zone between the Red

Sea and the Mediterranean, and another between the sea and the land as the “jetty pier, some two thousand yards along, extended into the roadstead.” “Sailors of various nations” bustle about, no doubt mixing their languages, religions, and other traditions, while past and present jostle as some coasting boats retain “the fantastic fashion of ancient galleys.” Economic institutions are presided over by merchants and brokers, and we can imagine French or British administrative officials exacting their canal zone taxes. All in all, this is a dynamic image of a liminal crossroads between land and sea. It is one of movement and activity that attracts people and connects them. It is also an image of social interaction that likely has more in common with other ports, such as Paphos or Piraeus, than the closest inland Egyptian town. Moreover, we are confronted with the image of a place that centralizes cultural, economic, and administrative needs into a kaleidoscopic hub whose itinerant inhabitants come together, interact, share their goods and traditions, and then return whence they came or head onwards to the next port of call. It is a place of transition, but also of economic and social possibility.

The point of this digression has been to conjure up the image of the port city as an *entrepôt* that clearly has many of the structural features emphasized in central place theory. Maritime ports have wide ranging connections to complementary economic networks of production and consumption, and so they provide a liminal context for the economic and political interactions that attract people to them and allow them to mix. However, they are not traditional central places in the Christallerian sense since the nautical nature of their connections can distort distance cost equations, and their liminal geographical settings provide them with an extra-centralizing feature: the gateway [38] (pp. 269–270), [39] (pp. 110–112).

The Latin word for port, *portus*, is clearly linked to the word for gate or entrance, *porta*, which sheds light on how the ancients perceived these liminal places that mediated between the wide open, and often dangerous, world of the sea, and the somewhat safer and more restricted terrestrial connections that prevailed on land. In addition, as has often been the case with port cities, such as Havana or Boston in the American colonial period, the gateway port frequently connects a provincial region to a national core and serves in that role until the frontier moves on, leaving the once important gateway to become a more typical central place that mainly supports the complementary region [38] (p. 270). Other modern examples of such cities in the non-insular sense might be Winnipeg, Manitoba, or St. Louis, Missouri, both of which served as a “gateways to the west” as settlers sought to populate North America during the 19th century, but which today are merely mid-sized regional cities.

In the Roman Mediterranean, ports’ connections to local, regional, and even imperial networks allowed them to serve as multi-directional gateways for large complementary areas that expanded, especially through maritime commerce, until they collided with long-term geographical boundaries (such as currents, dangerous coasts, mountain ranges, or non-economically viable lengthy trade routes), or short-term historical events (such as imperial conquest or increased economic competition). These boundaries and developments had a direct effect on the nature of mixing, liminality, economic and political institutions, and connectivity found in centralized ports that served as stimuli for regional settlement patterns and as crucibles for the negotiation of new social identities. For example, a recent study of the economic fortunes of the “gateway” port city of Naron in Dalmatia illustrates how a Roman port town could rise and decline based on its ability to retain its role as an intermediary between its complementary maritime and terrestrial regions [40].

Luckily, many of these gateway cities, such as Naron, have left abundant archaeological remains that permit us to glimpse the nature of life in a Roman port town. Yet, because ports were often Janus-like and acted as gateways to both land and sea, their archaeological stories must not only be terrestrial. Instead, they must also include archaeologies of the sea, with a particular focus on that liminal zone where ports are uniquely situated: the coast. Maritime evidence is thus critical to the study of port cities as central places since previous archaeological studies (and especially surface surveys) that have used central place theory as an interpretive approach to understanding human geographies have often focused on terrestrial sites situated at the nexus of road systems, such as regional towns. The analysis of ports as central places, however, requires one to consider not only such traditional

forms of terrestrial archaeology (e.g., monumental architecture, urban planning and infrastructure, or imported ceramics), and landscape features (e.g., elevation, hydrology, or strategic location), but also those material remains and geographical markers that make up the maritime cultural landscape.

The maritime cultural landscape is an analytical concept pioneered in the 1970s by Christer Westdahl who described it as a “cross-disciplinary mode of research” that sought “the obliteration of the archaeological border between sea and land, while recognizing the overriding importance of the position of this border in the past so as to analyze and interpret remains and their meanings” [41] (p. 733). For Westdahl, who was diachronically examining Scandinavian coastal remains, this landscape was made up of “—apart from shipwrecks—harbors and ports, including emergency harbors, anchorages, sea inns or taverns (with stage function), ballast sites, shipyards (or boatbuilding sites), maritime settlements and piers or other such constructions, as well as landing places” [41] (p. 736). The archaeological remains typically found within Westdahl’s maritime cultural places thus included those elements of material culture that signify human lifeways situated at the porous border of sea and land. Paul Rainbird has attempted to describe the material remains of such maritime landscapes and the communities that created them in the following terms:

Archaeologists of the sea need to identify maritime-related material culture, which can include such things as harbors/quays (sea and military), fishing gear and communal works (as it generally takes more than one person to operate a boat, etc.)...The boat for example, is a very rare find, but we have to start with the assumption that it existed and most likely in a form not found in landlocked communities. Once the boat is acknowledged, then a whole suite of related items of culture must be assumed for the maintenance and operation of such craft. This material culture and its practical and symbolic uses will constitute a distinctive community. [16] (pp. 59–60)

The archaeology of ports, then, requires a focus on the material remains from the intersection of terrestrial *and* maritime human activity, while also including a maritime cultural landscape interpretive perspective that concentrates on the liminal geographic spaces that ports specifically inhabit, that is, coasts. Thomas Tartaron has defined such areas as *coastsapes* in the following terms that are pertinent to the geographical and archaeological spaces inhabited by central place ports:

(1) the linear or convoluted shoreline and the adjacent coastal lowland that may be inhabited and exploited by maritime communities; (2) the connective routes and openings into the interior, which are often dendritic and follow natural paths connecting coast and hinterland (e.g., streams, mountain passes). The landward limit of the coastscape is often defined by ridges or mountains that block views to the interior and impede easy passage; (3) the inshore waters that are used on a daily basis for economic and social purposes; and (4) the visual seascape, the everyday field of view that defines the cognitive horizon in the seaward direction in recognition of a continuous cognitive landscape for which the land-sea interface is no boundary. [42] (188)

Considering the foregoing discussion of the interpretive value accrued from approaching port cities’ archaeology as one involving both terrestrial and maritime remains within a uniquely coastal landscape, the following analysis of port cities as central places in Early Roman Cyprus attempts to integrate such a panoptic perspective. In doing so, it considers the archaeological remains of Cyprus’ maritime cultural landscape (e.g., shipwrecks, harbor structures, and the ceramic evidence for maritime trade; see also Reference [12] (pp. 20–25)) within the context of each port’s unique coastscape to offer a critical insight into how ports could function as pivotal central places during Roman times.

4. The Ports of Roman Cyprus as Central Places

“In this Roman sea world—to parody George Orwell—all sites were equal—simply “nodes of density,” if you like (cabotage and the conditions of navigation saw to that)—but some sites were more equal than others.”

(Geoffrey Rickman on the relative importance of Roman ports) [43] (p. 16).

The following archaeological analysis of the ports of Roman Cyprus as central places is, necessarily, an archaeology of land and sea that examines terrestrial material culture and the maritime networks that supported its acquisition and creation. It draws on a critical mass of evidence that has emerged only in the last three decades from surface surveys and infrastructure studies, underwater port and shipwreck archaeology, terrestrial excavations, and specialist studies of ceramics, numismatics, sculptures, and architecture in order to explore how ports served as centralizing loci for socio-economic change in an island province [15] (pp. 13–27). Although this analysis could be extended to a range of known port sites of various sizes [3,34], I have decided to concentrate here on those two port cities singled out by Ammianus, Salamis and Nea Paphos, which Demetrios Michaelides has called “the leaders in the development in culture and the arts in Roman Cyprus” [44] (p. 128).

These cities also seem appropriate for analysis because their geography and history made them prime candidates to become Roman administrative centers and the largest coastal sites in Cyprus’ settlement hierarchy [45] (p. 244). Indeed, if we apply Rickman’s [43] (p. 16) Orwellian parody on the connectivity of Roman ports to Cyprus, Nea Paphos and Salamis were “more equal than others.” Moreover, if we compare these ports to Verne’s [37] (p. 37) vibrant vision of Suez, that is, as what Reger [36] (p. 14) refers to as a “sailor town,” we find that the archaeological evidence begins to present a similar image of liminal space, mixing, economic and political development, and intense connectivity. Therefore, as port cities that were “more equal than others,” both Salamis and Nea Paphos embody structural features similar to those outlined by Martínez and Tejerizo as characteristic of central places [19].

Cyprus became a Roman senatorial province during the 20s BC [5] (p. 1295). Following the defeat of the Ptolemies, and the removal of their *strategoi* (i.e., governors) from the capital city of Nea Paphos, the island seems to have been effectively governed by low-ranking annual Roman proconsuls who were assisted by a skeleton crew of officials [5] (pp. 1298–1308). Yet, aside from these Romans in the capital city, there is no evidence for colonies or a major military presence beyond the proconsul’s cohort [5] (p. 1296). With a Hellenized culture that had been intermittently influenced by Near Eastern traditions, such as the aniconic worship of Aphrodite [27] (p. 136), the Cypriots spoke Greek and generally attuned with the cultural and economic rhythms of the eastern Mediterranean. Indeed, Cyprus’ perennially lucrative geographical location on the sea routes between the Near East and the Mediterranean world assured that these long-term connections persisted into Roman times (Figure 4). As Ammianus and other ancient writers suggest, the island remained prosperous throughout the Early Roman period, and was known for its exports of wine, olive oil, and grain, as well as copper and timber [2]. The Romans supported such export industries by developing an extensive internal road system [46] on Cyprus that connected its coastal towns, but also provided a route across the island’s hinterland, likely to access the metalliferous regions near the Troodos mountains [47] (pp. 328–334) and the agricultural bounty of the east-central Mesaoria plain. However, once the resources were extracted, it would be Cyprus’ ports and the Cypriot ships that sailed from them that would facilitate their export [6] (p. 846). It was these ports that would serve as central place gateways between the traditional local lifeways of the hinterland, while permitting a mediated contact with the greater imperial world.



Figure 4. Map showing the location of Cyprus in the maritime world of the eastern Mediterranean during the Early Roman period. Map courtesy of Brandon Olson.

4.1. Salmis as a Central Place Port

Salmis' location on Cyprus' eastern coast had been lucrative since the Bronze Age due to the presence of inlets and the Pedaios and Yialias River mouths that connected the coast and sea to the low-lying agricultural heartland of the Mesaoria [33] (p. 30). Hence, the region of Salmis occupied a coastscape that allowed for dendritic terrestrial pathways to extend into the resource-rich interior, while maritime routes could be envisioned, and eventually plied, beyond the seascape's immediate horizon (Figure 5). Although Roman era ships could sail into the wind, sea routes from Salmis towards the mainland, especially to the east and northeast, would have been aided by the prevailing daytime southwesterly winds (especially in the summer and fall) [48] (pp. 38–43), as well as the coastal currents, which flow to the north and east [34] (p. 349). By the Archaic (eighth to sixth centuries BC) and Classical (fifth to fourth centuries BC) periods, Salmis had transformed into one of Cyprus' most prosperous cities and harbors, likely due to its role in exporting copper from the interior [49] (pp. 23–24). Its elaborate built tombs indicate that its Iron Age kings were regionally powerful, and according to historical sources, this power climaxed during the reigns of Evagoras and Nikokreon during the Classical period [50] (pp. 312–317, 332–335).



Figure 5. A “sailor’s-eye” view of the sea and coastline at the modern Salamis archaeological site looking to the northeast towards the Karpass Peninsula. Photograph by J.M. Gordon.

The city’s stature as the most developed port city in eastern Cyprus continued into Hellenistic (late fourth to late first centuries BC) times, when Demetrius Poliorcetes briefly made it into his capital city [49] (p. 167). However, by at least the early second century BC, the new Greco-Egyptian Ptolemaic rulers would transfer the capital to Nea Paphos on Cyprus’ west coast, likely because the main harbor facilities at Salamis had silted up [51] (p. 12). This silting seems to have caused either Demetrius or the Ptolemies to transfer the harbor facilities ca. 3 kms north to a site closer to where the major Roman era remains are located today [49] (p. 167). Yet, according to Strabo and the *Stadiasmus* (an ancient navigational guide likely of the third or fourth centuries AD) [34] (pp. 107–114), another port used by Salamis may have been located about 6 km to the south at a site known as Arsinoe-Amochostos, near modern Famagusta [3] (p. 232), [34] (p. 148).

Although little maritime archaeology has taken place at these sites, the ancient sources do mention harbors (λιμῆνες) being present. A λιμῆν is difficult to define, but it likely utilized natural bays, or in the case of Salamis, offshore reefs, enhanced by breakwaters [52] (p. 813). Based on the evidence from Mediterranean shipwrecks, large harbors would have been unnecessary, even at larger cities, as many ships involved in coastal trade seem to have been well under 100 tons [53] (p. 560), and so a great deal of product unloading could have been done with small skiffs or by simply wading to shore [53] (p. 561), [54] (pp. 33–34). John Leonard [34] (p. 148) has even proposed that ships coming to Roman Salamis might have anchored in the sheltered side of reefs directly opposite from the seafront (Figure 6).



Figure 6. Aerial view of the modern ruins of Roman Salamis showing the location of the theater, gymnasium, and baths. Note the reefs visible in the sea to the east. Source: Google Earth; Map Data: Google, Digital Globe.

According to *The Oxford Roman Economy Project's* online database of shipwrecks [55], out of the 18 shipwrecks known from Cypriot waters, only 6 may date to some point during the Early Roman period. Based on its find-spot, the only wreck from this group that may shed light on the types of ships that plied the waters near Roman Salamis is one analyzed by Justin Leidwanger from Fig Tree Bay [56], located roughly 20 km south of the port city. Although the wreck has only been surveyed, and it was not found in Salamis' immediate coastal waters, its proposed second century AD date and 5–6 ton cargo of over 130 amphorae capable of carrying wine, olive oil, or other products does provide some, albeit minimal, evidence for the types of ships that may have visited eastern Cypriot ports during Roman times. Was this one of the *onerariae naves* constructed in Cypriot shipyards mentioned by Ammianus? It is difficult to say, but the relatively small ship did have an impressive international cargo, which included amphorae not only from Cilicia, but also from as far away as Gaul. Despite the complex trading mechanisms that may have been involved in acquiring such a diverse cargo, Leidwanger [56] (pp. 203–204) suggests that these products may have been picked up via local tramping in small and large ports along the Syrian and Cilician coasts. Thus, although there is little archaeological evidence for Salamis' built harbors [34] (p. 147), and if the Fig Tree Bay wreck can be cited as plausible evidence for Roman era seafaring practices, the port city seems to have offered an adequate location for coastal transactions of products, such as olive oil and wine, from as far away as the western Mediterranean.

In addition to its ability to connect to external maritime trade, Salamis also served as a coastscape gateway to Cyprus' richest agricultural region, the Mesaoria [57] (p. 13). It is clear that the hinterland in the immediate vicinity of Salamis was well populated with a range of settlement types since 63 Roman era sites were discovered by Sophocles Hadjisavvas during a surface survey [58] (p. 249). This region would have been connected to Salamis by a radial series of roads that led to the city, and

Bekker-Nielsen [46] (p. 110) has identified four in particular: one north to the Karpass Peninsula, one heading south toward Kition, one heading northwest toward Chytroi (to which an aqueduct was also eventually built), and a final one leading towards the Kitian *chora* near the farming establishment of Panayia Ematousa [11].

Unfortunately, not much is known about how land was held in Roman Cyprus, but David Potter [6] (p. 849) assumed that it was controlled by local urban elites whose estates produced agricultural products, such as wine, olive oil, and grain for maritime export. Such a thesis seems likely since, by the early second century AD, Salamis appears to have grown into a large-scale central place supported by an economic base rooted in agricultural production, perhaps some manufacturing, and trade [34] (pp. 806–810). Salamis' site size was approximately 275 hectares [45] (p. 244), making it double the known size of the capital of Nea Paphos, and it had all of the key structural elements of a thriving port city.

Its economic and administrative functions are in evidence based on epigraphy and archaeology. Salamis' epigraphic record [59] (p. 240) sheds light on the massive wealth and political power that could be accrued by native Cypriots as the region's agricultural goods were prepared for export from the city's massive agora by workers, such as members of the flax-weavers guild [44] (p. 122). For example, extant dedicatory inscriptions illustrate that during the Flavian era (60s–90s AD), the Salaminian and Roman citizen, Sergius Sulpicius Pancles Veranianus, was able to be the high priest of Cyprus three times, the ambassador to the emperor three times, the builder of the theater and bath house, and the donor of imported marble statues to the amphitheater [60] (p. 119). He also no doubt spent time in the city's lavish gymnasium's palaestra, which today sports a striking colonnade made of costly imported marble (Figure 7). John Leonard [34] (p. 810) assumes that Pancles made his fortune, at least partly, via the maritime trade derived from Salamis' central location.



Figure 7. The Salamis gymnasium palaestra showing the imported marble colonnade. Photograph by J.M. Gordon.

As Salamis' civic benefactions attest, the city was well decorated with the architecture of *Romanitas*, illustrating a clear connection to other cities in the region, such as Seleucia-in-Pieria, the port of Antioch, and likely the marble-rich cities of western Asia Minor or the Aegean. Salamis' prominence in Cyprus is illustrated on Roman coins of the period [61] (pp. 40–41, 87) (Figure 8), which highlight the importance of the city's primary deity, Zeus Salaminios, while its international fame is attested to in the ancient literary sources, through its rebuilding by Hadrian after a local revolt [57] (p. 143), and through its position as an administrative *conventus* [44] (p. 116). Such cross-cultural interaction is also evident among the site's imported marble statues, such as the statue of Zeus Capitolinus [62] (pp. 31–32) from the gymnasium's palaestra or the interspersing of imperial cuirassed statues with images of Greek deities (including Apollo, Dionysos, and possibly Aphrodite) in the city's theater [63] (pp. 175–185). Such religious mixing is also evident from biblical and literary sources, which describe St. Barnabas, a native of Salamis, and St. Paul arriving at Salamis by sea from Seleucia-in-Pieria and worshipping in the synagogues of the Jews [64].



Figure 8. Reverse image of the statue of Zeus Salaminios on a silver tetradrachm minted under the authority of the emperor Vespasian for Cyprus (77–78 AD). Image courtesy of the American Numismatic Society.

Salamis thus seems to have had all of the key structural features of a centralized, port city [45] (p. 243). It was a center of economic and political development that dominated the seemingly small sites of its local hinterland, it was a gateway or liminal zone not only to the Cypriot interior, but also to the greater sea-lanes of the eastern Mediterranean, and its multifaceted connectivity encouraged the mixing of people and ideas from the Salamis region, the eastern Mediterranean, and even from Rome itself when people like Pancles served as “ambassadors to the emperor.” In essence, Salamis became a liminal, yet centralizing, focal point whose economic, political, and cultural influence can be detected throughout the Mesaoria [5] (p. 1323). It was the type of place where local culture could become global, and where new social identities that combined the insular and the cosmopolitan could be shaped. Salamis, as a Roman port city, was a crucible for cultural change.

4.2. Nea Paphos as a Central Place Port

Having discussed the most important central place on Cyprus' east coast, it is instructive to compare how the predominant site on the island's west coast, the Roman capital of Nea Paphos, also functioned as not only a regional central place, but perhaps also an economic and administrative gateway for the entire Roman province.

Nea Paphos was founded in the Late Classical period by Nikokles [65] (pp. 67–75), [66] (pp. 287–288), the last king of the Paphian kingdom, which had been previously centered at the site of Palaipaphos (or “Old Paphos”), located about 20 km east of Nea Paphos and famous for its ancient sanctuary of the Cypriot god *par excellence*, Aphrodite [27] (pp. 238–251). As was the case with Salamis, the site of Nea Paphos was likely selected due to its strategic location. It presents another economically advantageous coastscape with a relatively low-lying site (which included two hills that served as seafaring landmarks) that also had access to the region's upland forests and copper-bearing areas [65] (p. 18), [66] (p. 287). However, it was likely its promontory position at the nexus of Cyprus' western and southern coasts that transformed it into a “sailor town” since ships coasting the island would have had to round the cape as they sailed to the east or northwest. Moreover, based on the prevailing westerly winds and Cyprus' counter-clockwise currents [34] (p. 349), Nea Paphos could further serve as a starting point for sailors wanting to tramp along Cyprus' southern coasts or even head into open waters destined for or returning from Alexandria in Egypt [34] (pp. 340–341). Indeed, such southern voyages may have increased during the Hellenistic period when the Ptolemaic kingdom transferred Cyprus' administrative capital from Salamis to Nea Paphos [51] (p. 12) and developed the city's protected southern harbor as a site for the construction and outfitting of naval ships [65] (p. 109). When the Romans conquered the island, they also recognized Nea Paphos' strategic location as a gateway city [45] (p. 246), and so the city remained the provincial capital and home of the proconsul [44] (p. 116), [65] (pp. 133–134). Strabo describes its harbor as a λιμὴν [3] (p. 232), while the *Stadiasmus* refers to it as triple harbor for all winds, a designation that has been difficult to understand [34] (p. 586).

Archaeological research on Nea Paphos' main southern harbor indicates that it would have had large-scale western and eastern breakwaters. These barriers extended from the Hellenistic city walls and came together to form a small entrance between two fortification towers [67] (pp. 199–201) that could be closed by a chain creating what ancient writers refer to as a λιμὴν κλειστός (a term which Scylax uses to describe Salamis' harbor, and Strabo utilizes to discuss Kition (modern Larnaca)) [48] (p. 813) (Figure 9). Some of this construction was likely Ptolemaic, but the presence of concreted sections also suggests Roman interventions, likely following the known earthquakes of 15 BC or 77 AD [34] (p. 586). There is no evidence for a triple harbor; however, recent research by the Polish Paphos Agora Project has explored the possibility that some boats may have accessed the city at a point near the northwest city wall [68] (pp. 12–15). Whether this area was the location of a now silted-over harbor feature or not remains unclear, but John Leonard has also noted D.G. Hogarth's suggestion that the sea once extended inland to the city wall gate and that “a descending ramp with steps at the bottom once served as a convenience for boats” [34] (p. 588).

The presence of one large built harbor as well as possible ancillary boat launches at Nea Paphos emphasizes its role as a major maritime administrative and economic hub that served as a gateway for imports to and exports from the Cypriot hinterland. Although no Early Roman shipwrecks have been discovered along Paphos' coasts (the closest ancient shipwrecks of any date are found closer to Kourion to the east or the Akamas Peninsula to the north [55]), judging by the size of the city's main harbor [68] (p. 9), it seems that many different ship sizes could have unloaded at quays on the inner sections of the eastern or western moles [69] (pp. 650–653) with products coming from a range of foreign ports. For example, Anthi Kaldeli's analysis of the imported amphorae discovered at Nea Paphos [70] (p. 130) shows that Cyprus' exchange network with the western Mediterranean mainly involved passing through the capital city of Nea Paphos, since amphorae from Italy, Gaul, Spain, Portugal, and North Africa, have all been found in larger numbers than at other Cypriot sites.

Clearly, Roman Cyprus' capital was a place where traders from throughout the Mediterranean could economically and socially intermix with both local Cypriots and Roman administrators [5] (p. 1321).



Figure 9. Aerial view of the modern Nea Paphos archaeological site. The remains of the southern port's breakwater are visible at the bottom right. Source: Google Earth; Map Data: Google, Digital Globe.

Nea Paphos' exports, like those from Salamis, likely came from its immediate hinterland. Since it was closer to the Troodos mountains, alpine timber for ships and perhaps copper from the foothills might have been exported via the port city along with local grain [65] (p. 109). The more famous products of wine and olive oil mentioned by Pliny the Elder [2] (p. 139) would likely have been available as well. If Cypriot sigillata fineware or pinched-handle amphorae [71] (pp. 166–168, 172–174) were made in western Cyprus as some scholars believe, then these ceramics may have also been exported from Nea Paphos. The timber, copper, and grain could have been brought to the coast via one of the three roads that Bekker-Nielsen [46] (p. 110) has identified as radiating out of Nea Paphos, one to the north, one to the west, and one to the east, with the eastern road likely serving as Strabo's *hieros odos* that connected the shrines of Aphrodite in Nea Paphos to her ancient ones in Palaipaphos [5] (pp. 1309–1310). The need to bring export products to market, the presence of wealthy Cypriot middlemen and Roman administrators, and the availability of imported products from ceramics to wine, likely caused many people living in the hinterland to migrate towards this central place to find their fortunes [6] (p. 842).

Such a scenario can be supported by David Rupp's analysis of the Canadian Palaipaphos Survey Project (CPSP) data, which examined the settlement patterns of the Paphian hinterland [45]. Rupp's team revealed an expansion of settlement throughout the Paphos region during the Late Hellenistic and Early Roman period [45] (pp. 252–253). Moreover, based on the idea that Nea Paphos' population likely increased leading to a need for settlements to expand beyond the city's Hellenistic

era walls, the CPSP revealed the likely presence of a hierarchy of settlements from tiny farmsteads of approximately 1 hectare in size to suburban small towns all situated within about 20 km from the city center [45] (pp. 247–249). These settlements, judging by the lack of sophisticated architectural finds, were likely inhabited by lower class agricultural workers and small-scale craftsmen whose agricultural surpluses supported the urban elites in the capital. Rupp labeled this type of development a “dendritic” central place system since the second and third rank settlements, typically situated along roads, rivers, or the nearby coastline, acted like roots that nourished the central place [45] (p. 249). A similar relationship between a central place and its region might also be observed at the small southeastern port of Pyla-Koutsopetria, which recent survey evidence suggests was a thriving maritime village in Early Roman times with likely administrative links to the larger port of Kition about 10 km to the west [72] (p. 289). The dendritic phenomenon that lay behind Cypriot settlement patterns is further espoused by Bekker-Nielsen, who recognized that the roads of Roman Cyprus “formed part of long-distance trading networks, but in a secondary and ancillary role in relation to sea transport” [73] (p. 13). Thus, due to a central place’s parasitic economic power, people were likely drawn to live closer to it and its maritime connections. This observation is valuable because it begins to explain why some non-coastal Cypriot archaeological sites, such as Idalion or Tamassos, have not yielded similar globalized trappings (such as imported marble-clad buildings or sculptures) to those found in coastal urban centers [5] (pp. 1331–1332) and why several rural sanctuaries went into decline during Roman times [10] (p. 50).

The archaeological remains from the urban center of Nea Paphos further indicate that the city profited both from its liminality as a portal to its hinterland, and as a maritime gateway to the wider Roman world. Although many urban spaces excavated in the city likely date to the Hellenistic period, including the city’s agora and theater [68] (pp. 4–5), Nea Paphos’ increased centrality in the Roman era caused these areas to become monumentalized. For example, the agora gained an imported marble colonnade [27] (p. 225) while the theater acquired a baroque *scenae frons* [74] (pp. 179–183), likely through imperial euergetism. In addition, judging by its appearance on Roman coins (Figure 10), the Sanctuary of Aphrodite at Palaipaphos, complete with its ancient tripartite temple and aniconic baetyl, which was visited by such voyagers as the future emperor Titus [60] (p. 99), was likely enhanced architecturally during the Roman era. This sacred monumentalization was not only enacted so as to reinforce the fame of Cyprus’ foremost religious shrine, but it was also aimed at transforming it into a center of imperial cult worship [27] (p. 272), a fact supported by the discovery of the so-called “Oath of Allegiance to Tiberius” at the site [60] (pp. 77–91), an imperial oath sworn by the aristocratic leaders of Cyprus’ league of cities: the *Koinon Kyprion*. The funding for monumentalizing the city and its nearby sanctuary likely came from a combination of local and imperial funds, since literary sources and coins may indicate that Nea Paphos received imperial aid following earthquakes in 15 BC and 77 AD [65] (p. 33), [61] (p. 95). Nea Paphos’ administrative primacy in Roman imperial Cyprus is echoed in the city’s full epigraphic titulature as well, which by the early third century AD read as: “Σαβαστηὶ Κλαυδία Φλαυία Πάφος, ἡ ἱερὰ μετρόπολις τῶν κατὰ Κύπρον πόλεων” (Augusta, Claudia, Flavia Paphos, the holy metropolis of the cities in Cyprus) [5] (p. 1310). Although, one extant inscription competitively shows that Salamis also referred to itself as Cyprus’ mother-city [59] (pp. 142–143), the larger volume of inscriptions describing Nea Paphos as “metropolis” seems to solidify its elevated political position [5] (p. 1314).

The cultural effects of Nea Paphos’ centrality were perhaps best witnessed in the elaborately decorated villas of Early Roman date that were discovered to the south of the city’s agora [27] (pp. 226–235). Excavations have revealed a series of large Roman atrium houses of second and third century AD date, which are decorated with elaborate mosaic floors that indicate cultural dialogues with wider Greco-Roman culture [75] (p. 5). In the so-called “House of Dionysos,” depictions of the Greek myths of the Triumph of Dionysos (Figure 11), Piramus and Thisbe, and Ganymede rival mosaics found throughout the Roman east [76], while images of the seasons or hunting seem similar to topics found in North Africa.



Figure 10. Reverse image of the Temple of Aphrodite at Palaipaphos on a silver tetradrachm minted under the authority of the emperor Vespasian for Cyprus (77–78 AD). Image courtesy of the American Numismatic Society.



Figure 11. Floor mosaic from the House of Dionysos, Nea Paphos, showing the Triumph of Dionysos. Photo by J.M. Gordon.

Imported marble statuary found in the houses also reflects the choices made by the denizens of Roman Nea Paphos [9] (pp. 111–117). Sections of the Late Roman “House of Theseus” also proved to have been decorated with a range of second century AD imported marble statues and statuettes. Unique statues, such as the Aphrodite Armata (or *Hoplismene*) [77] (Figure 12), were

combined with more traditional Roman copies of Greek originals representing Asclepius, Artemis, and Hercules indicating a penchant for works that were meaningful to both local and elite Roman viewers. Taken together, these types of evidence suggest that Nea Paphos' economic and administrative functions, along with its liminality and connectivity, made it an ideal center for the types of cross-cultural mixing that could lead to the negotiation of culture and the creation of new identities. Like Salamis, it served as a centralizing hub, not only for its hinterland and western Cyprus, but also perhaps for ships sailing between Nea Paphos and Alexandria, the embarkation point for the Egyptian ships in Rome's famous *annona* grain fleet [70] (pp. 131–132), [78] (p. 266).

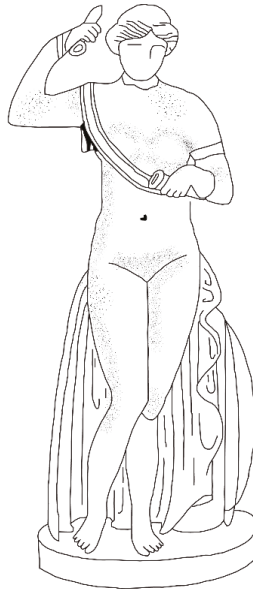


Figure 12. A reconstruction of the Aphrodite Armata statue from the House of Theseus at Nea Paphos. Digital drawing by J.M. Gordon, after Daszewski 1982, p. 199, Figure 1 [77].

5. Conclusions: Cyprus—*Insula Portuosa* or *Insula Portunalis*?

In sum, I would like to offer a few observations about how the two major port cities of Cyprus, Salamis and Nea Paphos, functioned as central places that fostered the expanded economic development of their regions and served as contexts for the social interactions that transformed local culture during the first three centuries AD. Returning to Reger's [36] structural features that make ports unique central places, both Salamis and Nea Paphos were marked by their liminality and connectivity. According to surface surveys and road network analyses, they both served as coastscape gateways that connected a terrestrial hinterland of smaller settlements to an open-ended range of maritime networks buoyed up by Rome's protection of shipping [72] (p. 289) and the imperial center's need to exploit its provinces [8] (p. 368). That the Romans appreciated Cyprus' ports, and especially Salamis and Nea Paphos, is evidenced through their appointment of an epigraphically attested, *Lymnarcha Cypri* [44] (p. 116), and because imperial funds were likely used to repair both cities following earthquakes and social disturbances. The evidence gleaned from each city's maritime cultural landscape, which includes shipwreck, amphora, and harbor remains, as well as the presence of favorable winds and currents, further indicates that both direct long-distance and indirect short-haul trade could be experienced. In addition, the evidence suggests that both sites had harbor facilities

capable of accommodating various sizes of ship, from relatively small crafts, like the Fig Tree Bay ship, to perhaps larger “oneraria naves,” such as the vessels of the *annona* grain fleet.

This connectivity, along with the *longue durée*, “permanent value” factors of coastscape location and religious importance, allowed for Salamis and Nea Paphos to continue their Hellenistic era prominence and emerge as large-scale economic and administrative centers during the Early Roman era. Both ports offer evidence for the economic success of their elite landholding classes and also reveal local elites’ collaboration with the imperial Roman authorities in efforts to centralize administrative power [8] (p. 376). Indeed, as Martínez and Tejerizo [19] (p. 85) have pointed out, most central places require such elites as mediators between the socio-economic needs of their complementary regions and those of wider states: “Central places can be analyzed as a reflection of elite power in a particular region, and, at the same time, as the consequence of a dialectic and dynamic balance between state and regional elites.” Hence, in some ways, the central place cities of Roman Cyprus, with their elite leaders like Sergius Sulpicius Pancles Veranianus, were evidently not so different in function to those of Late Antique Spain [19] or even Aztec Mexico [20] (p. 116).

Yet, even if Nea Paphos became the provincial capital, why was Salamis able to rise to a rivaling level of regional centrality? How could a relatively small, insular landscape like Cyprus support *two* first-rank, central place ports with different long-term permanent values during Roman times? We can infer that this situation likely resulted from several factors, which allowed each port to cultivate and manipulate its own sphere of terrestrial and/or maritime influence.

First, these two ports were separated by a large terrestrial boundary in Cyprus’ mountainous interior, the Troodos Massif and its surrounding foothills, which may have set a physical limit on the dendritic power of each port’s economic control of the hinterland. However, despite such geographical barriers, it still seems that each port had access to a significant complementary resource zone, with Salamis controlling the larger and more fertile terrestrial areas of the Mesaoria. Nea Paphos, on the other hand, in order to compensate for its lesser terrestrial sphere, may have prospered by virtue of its strategic coastal location on the island’s southwest promontory, which granted it access to profitable maritime networks.

Because Cyprus’ two largest port cities were in different geographical locations vis-à-vis west to east trade routes, winds, and currents, the ships that arrived at their harbors seem to have had different cargoes, at least judging by the available archaeological evidence [56,70]. This fact reveals that each port was involved in differing networks of connections, and hence, was open to diverse economic and political possibilities. Thus, even if Salamis’ hinterland might have provided more access to Cyprus’ agricultural and metallic resource potential, perhaps Nea Paphos’ connections to more lucrative sea networks, including those possibly plied by the imperial *annona* fleet, presented the western port’s citizens with greater access to the expanded economic possibilities accrued from trans-Mediterranean trade. Such connections to sea routes favored by traders, soldiers, or functionaries who represented Roman imperial interests may have also solidified Nea Paphos’ role as provincial administrative capital. This political status likely increased the port’s nature as a regional central place from which the Roman proconsul adjudicated the laws and kept the peace, as St. Paul’s famous meeting with Sergius Paullus indicates [64].

The differing maritime connections of Nea Paphos and Salamis have also been emphasized by John Lund in his long-term analyses of ceramic circulation trends in Cyprus: “Western Cyprus was connected with Rough Cilicia, whereas Eastern Cyprus and the Easternmost part of Southern Cyprus were similarly tied to Smooth Cilicia and North-eastern Syria” [71] (p. 242). Moreover, Anthi Kaldeli, in her study of mechanisms of exchange in Roman Cyprus, showed that Nea Paphos was the main gateway for goods coming from the west to the island, while sites like Amathus—and likely Salamis as well—were “primarily involved in eastern exchange networks” [70] (p. 130), perhaps similar to those evidenced by the Fig Tree Bay shipwreck’s cargo [56]. Hence, in Christallerian terms, it would seem that each central place’s maritime and terrestrial complementary region provided unique cultural and economic benefits that, when combined with each city’s permanent geographic and cultural

values, resulted in both ports experiencing an enhanced level of regional centrality within the *histoire événementielle* of the Pax Romana.

These port cities' liminality, connections, and economic/political development made them into ideal central loci for the mixing of people from the Cypriot hinterland, other regional ports, or even from as far away as Egypt, Rome, or Spain. It was in the dynamic coastscapes of these cities—their harbors, agoras, theatres, and gymnasia—that new notions of what it meant to be Cypriot in the Roman world were negotiated. Therefore, it is here that we see Cypriots building baths and amphitheatres and decorating them with mosaics and marble statues similar to those found in other port cities throughout the Roman world. Yet, since Cyprus' ports likely also hosted practices found in prototypical "sailor towns," like socio-cultural mixing, we also see some local choices in terms of material evidence for the veneration of local deities, like Zeus, and especially Aphrodite, that were long connected to Cypriot myth-history. In fact, it was these two deities who were chosen to represent Cyprus' two central place ports on the Cypriot coinage, with the Temple of Aphrodite at Palaipaphos (Figure 10) featured on some reverses, and the Statue of Zeus Salaminios (Figure 8) featured on others [5] (p. 1322). These central places also seem to have utilized different calendars [60] (pp. 144–156), with Nea Paphos, as the administrative capital, adopting an imperial calendar, while Salamis retained an older, Egyptian calendar [5] (p. 1314). It is difficult to say whether the use of different calendars indicates competition between the cities, but it does show that civic identities in Roman Cyprus, especially in large central places, were meaningful on the regional level [59] (p. 254).

It is also interesting to note that these central places' wealth did not seem to "trickle down" to the hinterland sites that supported their rise. Although imported ceramics have been found at some interior sites, like the farming settlement at Panayia Ematousa [79] (pp. 205–217) or the necropolis at Athienou-Magara Tepeşi [80] (Figure 13), most places assumed to be small farming villages or resource extraction centers lack the evidence for monumentality or conspicuous consumption. This state of affairs was also witnessed in the mining regions of the Troodos mountains where the Troodos Archaeological and Environmental Survey Project (or TAESP) team found that "no evidence for consumer wealth or elite settlements could be associated with this period, suggesting that the wealth from the rich natural resources was not redistributed locally" [47] (p. 333). The central place ports were economically parasitic.

Even the smaller harbors that made Cyprus into an "insula portuosa" do not seem to rival those of Salamis and Nea Paphos. Instead, these second-rank ports, such as Dreamer's Bay, which Stella Demesticha and John Leonard have identified as a "busy maritime emporium" (with approximately 0.5 km of archaeological surface features currently being explored by the University of Leicester [81] (p. 10)) where "imports intended either for local consumption or further exchange via *cabotage*" [82] (pp. 201–202) were unloaded, nonetheless never attained the centripetal economic and cultural force required to sustain a first-order central place. Further evidence for such "cabotage" ports has also been found at Pyla-Koutsopetria near Kition. Here, surface survey has revealed that table ware pottery, like Eastern Sigillata A, likely from Syria, was more common than Cypriot Sigillata (from either western Cyprus or Cilicia), even as the main Early Roman forms of imported wine and olive oil amphorae arrived from western sources in the Aegean [72] (p. 290). Although it is not impossible that these wares arrived at Pyla directly from their sources, the nature of the assemblage hints at more complex, and less centralized, trading mechanisms (such as those gleaned from the Fig Tree Bay ship's cargo [56]), with imported products being unloaded at larger ports like Kition and Salamis and then being distributed via different, likely short-haul, regional modes (either by land or sea) to smaller sites [72] (p. 291), [54] (pp. 33–34). Thus, Cyprus' central place ports seem to have created several nodal orders in terms of social identities during Roman times. The first order ports fostered wealthy cosmopolitan identities that was forged by the economic and political possibilities of highly connected central places. Conversely, in the second and third order sites located in the deep hinterland or along infrastructurally intermittent coastal bays and beaches, people's identities were conditioned by each

site's relative connectedness to the economic opportunities offered by maritime networks during the Early Roman period.

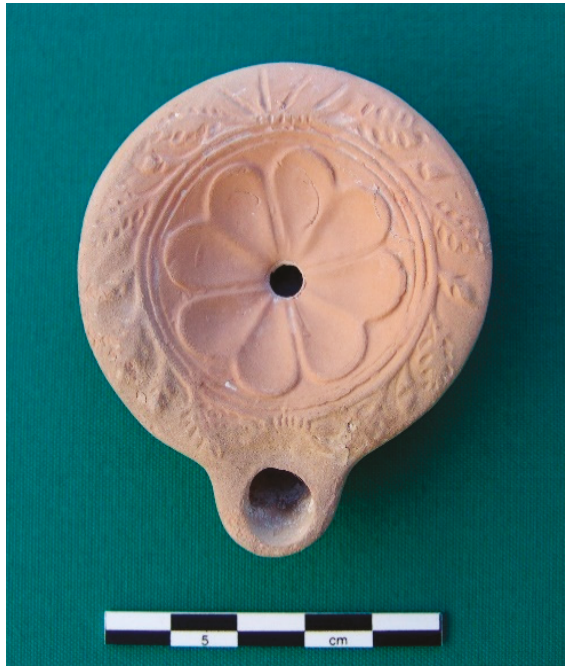


Figure 13. A Roman mold made lamp recovered from a rock-cut chamber tomb at Athienou-*Magara Tepeşi*. The lamp was likely made by the “Romanesis” workshop on Knidos in the Aegean Sea and imported to Cyprus during the early second century AD. Photo courtesy of the Athienou Archaeological Project.

Given Cyprus’ long and accessible coastline, Ammianus Marcellinus was wise to refer to it as an “*insula portuosa*.” However, taking into account the foregoing analysis of Cyprus’ central place ports, Salamis and Nea Paphos, a more appropriate term may have been an “*insula Portunalis*” or a “Portunus-like” island where “some sites were more equal than others.” The Roman god Portunus, whose name is related to “*porta*” or “*gate*,” was not only the god of ports as gateways to the sea [83] (p. 516), but he was also closely related to Janus, the Roman god of boundaries, crossing places, or passages who is typically depicted with two conjoined heads looking in opposite directions [84] (p. 587). Hence, Cyprus, like Janus, seems to have been endowed with two heads in the form of Salamis in the east and Nea Paphos in the west, two central places that each dominated their surrounding territories until such connections were interrupted or manipulated by either a *longue durée* geographic feature (e.g., the Troodos mountains) or a short-term structural force (e.g., a competing port, such as Seleucia-in-Pieria or Rhodes, or perhaps the intervention of Roman imperial policy, such as the possible route of the *ammona* ships). Overall, the Roman period in Cyprus may mark a turning point when Cyprus’ largest port cities transformed the *insula “portuosa”* into an *insula “Portunalis,”* a change that would have significant repercussions for the island’s settlement hierarchy, landscapes, and ultimately, the identities of Cypriots as active participants in the connected and increasingly globalized world of the Roman Mediterranean.

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Article

From Town to Countryside: Middle-Byzantine Bath-Houses in Eastern Crete and Their Changing Functions

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Abstract: The article examines the context of a recently discovered double bath-house complex in Loutres, a site near Mochlos on the north shore of eastern Crete. The excavators explore the broader questions posed by the finding, in connection to both its immediate surroundings and its wider periphery. Its relation to the site's geography, a ravine on the shore, forms the starting point to address issues regarding its original use as well as its later transformations. The enquiry leads into considering similar structures with different fates in the area and the connotations regarding their relationship to both the landscape and the settlements to which they belonged. The article goes on to discuss the general issues of the historic context of medieval Crete concerning both the archaeology and the information from the sources. It seems that long-held concepts about the abandonment of seaside settlements due to the so-called "Arab threat" are no longer valid. On the contrary, archaeology proves the continuity of the settlements of eastern Crete, both in Loutres and elsewhere. Moreover, the later use of the bath-houses in the area provides evidence for social changes after the 13th century impacting on both the landscape and its settlements.

Keywords: Byzantine bath-houses; medieval Crete; Byzantine settlements of eastern Crete; urban culture of Byzantium; church architecture; Secular Byzantine architecture; Byzantine Mochlos

1. The Area of Research and the Excavation in Loutres

Mochlos is a seaside settlement on the northern shore of east Crete (Figures 1 and 2). The site is famous for the Minoan settlement that was unearthed on a small islet just off its shore [1] (pp. 419, 442). Yet, in the area there is plentiful evidence for occupation and activity from different historic periods: on the shore, just across the island, there are rock-cut tanks for fish farming—*vivaria* dated to the Roman period [2,3] (p. 17). On the island itself there are traces of a retaining wall extending along its higher northern part that has been dated to the Byzantine period. Another interesting structure found is a free-standing tower dated after the 7th century [4,5].

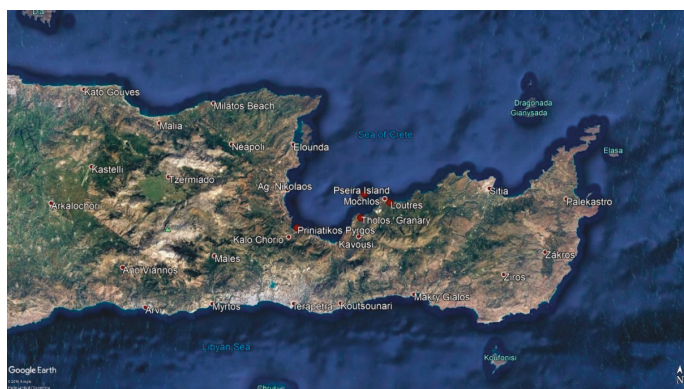


Figure 1. Map of Eastern Crete. (Source: Google Earth).

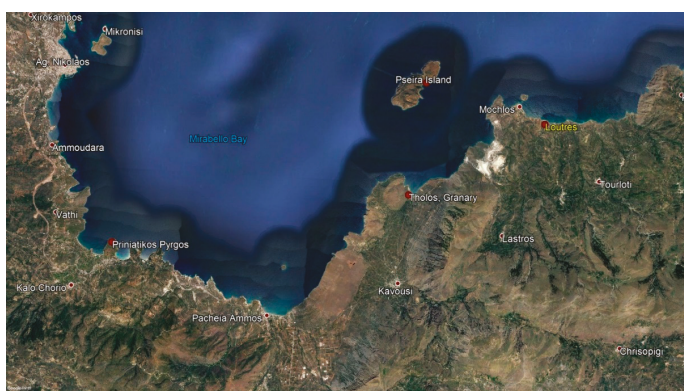


Figure 2. Map of Mochlos and its surrounds. (Source: Google Earth).

Less than a kilometer to the east of Mochlos, on top of a small hill and close to the shore, are remnants of a small basilica, probably of Late Antique date ([3] (pp. 17, 136); [6]). Some 200 m west of that, on a ravine between two hills, stands a cistern of medieval construction technology, ideally situated to collect and store water from the nearby stream (Figures 3 and 4). A cistern of similar technology and scale was found on the Byzantine settlement on Pseira Island (Figure 5).



Figure 3. Aerial view of the site Loutres from the North. (Photo: Ph. Stefanou).

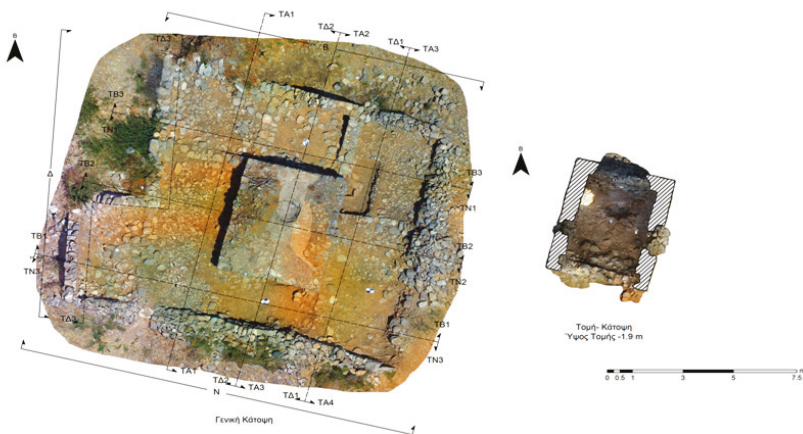


Figure 4. The cistern on the site Loutres, east of Mochlos, Siteia. (Orthophoto: Ph. Stefanou).



Figure 5. The cistern of the Byzantine settlement on Pseira island. (Photo: N. Poulou).

Nearly 20 m to the north of the cistern in Loutres we discovered and excavated a small cruciform vaulted structure of similar construction technology and scale that was clearly a bath-house [6,7]. Much to our surprise, a few meters to its northeast, we discovered yet another cruciform vaulted bath-house (Figure 6). Both structures are quite similar, although not identical, while it is clear from certain characteristics that both are bath-houses. The example to the southwest is in much better condition and has preserved evidence for its continuous use and for several later transformations: it seems that the structure underwent at least two building phases while functioning as a bath, although with several alterations in the second phase. Later, it was converted into a kiln for producing ceramics. Fairly recently, probably even in the 19th century, it was still in use, but by this time as a lime kiln, before it collapsed and was finally abandoned [6].



Figure 6. Aerial view/plan of the site in Loutres. From bottom: Building A (cistern), Building B (bath-house) and Building C (bath-house). (Orthophoto: Ph. Stefanou).

For both bath-houses, ceramic amphorae were used as air and water pipes, inserted into their walls (Figures 7 and 8). This vase type serves as a *terminus post quem* for the erection of the buildings: we identified the ceramic form as that of the so-called *spatheia*, small-sized amphorae imported from the area of Tunisia and dated from the mid-7th to the early 8th century [8] (pp. 127–129, fig. 69. 3B) (Figure 9). These offer evidence for dating the construction of the bath-houses sometime in the late 7th/8th century. Both structures probably were used for bathing as late as the 12th century, when the first was turned into a workshop for producing ceramics.



Figure 7. Amphorae deployed as air- and water-pipes in secondary use are found in both structures. (Photos: A. Tantsis).



Figure 8. Detail of the positioning and remains of clay pipes (re-used amphorae) in Building C. (Photos: A. Tantsis).

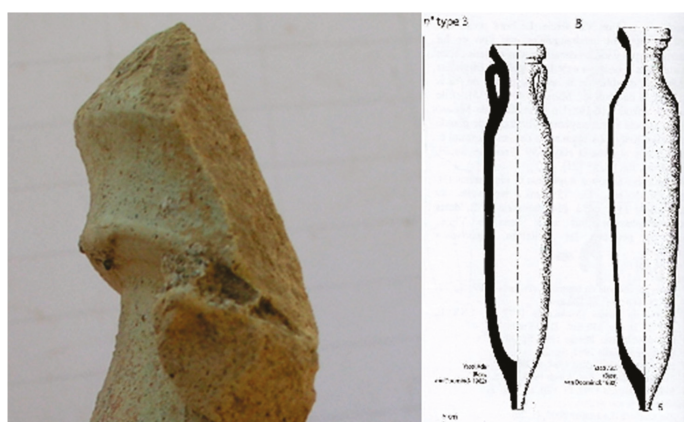


Figure 9. Fragments of amphorae (spatheia) re-used as air-pipe (Photo: N. Poulou). Same type as Bonifay 2004, 127–129, fig. 69, type 3B (shown on the right).

2. The Loutres Bath-Houses and Their Broader Context

The bathing complex we have uncovered in the locale known as Loutres, close to Mochlos, in east Crete, is very interesting for a variety of reasons (Figures 10–13). This paper will deal extensively with its setting both in the narrow sense and in a broader one. We will try to investigate the buildings' relationship to their environment and try to explore issues regarding functionality and the way they fit into the social and historic context of the transition of Crete from the early to the late middle ages. Our investigation will address issues of the transformation of urban culture in the transition from Late Antiquity to the Middle Ages and support the idea that towns and settlements continued functioning into the late Byzantine period. Our starting point is the bathing complex in Mochlos but the investigation will expand to include related issues concerning similar structures, mainly in eastern Crete (Figure 14).



Figure 10. Building B and C (bath-houses) seen from the East. (Photo: N. Theodoridis).

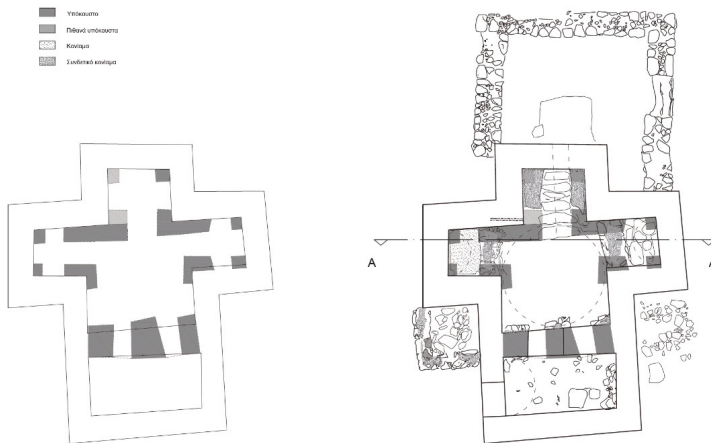


Figure 11. Two plans of Building B. The shaded area in the plan to the left represent the hypocaustal area, while the plan on the right includes adjacent structures. (Drawing: Th. Mangana).

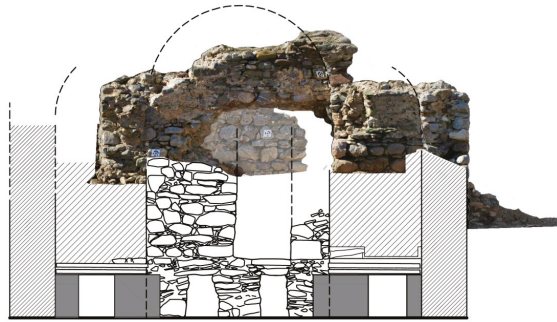


Figure 12. Elevation drawing of Building B, depicting the hypocaust and vault reconstruction. (Drawing: Th. Mangana).



Figure 13. Details of hydraulic mortar covering both the outside and the inside surfaces at both bath-houses. (Photos: A. Tantsis).



Figure 14. Aerial view of the cistern and the bath-houses on Loutres, from north-west. (Photo: Ph. Stefanou).

The archaeological investigation of the site is far from complete; in fact, we know very little regarding its context, both functionally and socially. On one hand, we lack, thus far, any evidence concerning the bath-houses' original surroundings. We can only suppose that both were part of a bigger building complex that was instrumental to their function. This complex could be extensive or small, yet it is quite plausible that these buildings were not isolated. It is feasible that these are the

better preserved since they were constructed with more durable and water and fire-resistant materials, measures that contributed to their survival.

On the other hand, we know next to nothing regarding the complex's social context. Was it close to a settlement and, if so, what was its character?

Bathing as a social ritual has been associated with the urban life of the great or smaller cities of the Roman empire [9]. Nevertheless, there is plenty of evidence that bathing was commonly catered for with special structures both in towns and in the countryside. Throughout the Roman world, bath-houses operating in different social contexts varied in terms of scale, grandeur and overall luxury. These are the characteristics that distinguished bath-houses of the city from those of the countryside. The size, lavishness and technology of any bath-house are indications of the size and the resources of the community it served. Great *Thermae* are the hallmark of imperial patronage in the capital and certain imperially favored cities in the periphery. Lesser structures were scattered all over the empire, in cities, towns, villages and isolated residences, both in cities and far from them [10]. While scale has often been regarded as a distinguishing feature between public and private bath-houses, it is not an absolute indicator, and we should allow for hybrid installations.

A tendency to view bathing culture as a mainly urban phenomenon persists in modern scholarship; recent archaeological findings, however, have challenged this deeply-rooted assumption, broadening the narrative to include a more nuanced interpretation of the evidence. This urban reading still appears frequently in the literature discussing the manner in which bathing as a social activity, and bath-houses as public spaces, were impacted by the Christianization of Roman society, as can be seen in Yegül's recent bath-house study [9] (pp. 199–212).

The whole issue is complicated and is closely related to the way urban life and urban space was transformed due to its Christianization. It was long held that the great public bath-houses were abandoned following the large-scale adoption of Christianity. This was seen in connection to new moral codes and habits, prohibiting the exposure of nudity and any indulgence in physical pleasures. Yet it seems that changes in bathing habits are more of an indication of a shift in the economy's character than in its morals. From the 5th to the 6th century, public space was dominated by the Church, and its clerics and bishops seemed to occupy the role and functions of previous urban institutions that were no longer functioning or transformed. The church was all the more responsible for the upkeep of public amenities and thus minimized expenses allotted to functions that were previously lavishly catered for [11,12].

It is well known that bath-houses were still constructed, maintained, repaired and functioning long after the triumph of the Christian church. Moreover, public bath-houses were connected and operated by the Church as an institution. Bathing became more intimate; the whole ritual was shortened, and its architectural setting became smaller and less lavish. This might be an indication of moral strictness, yet there is a sense of a new ethos fitting an economy not supported by the state as well. In Philippi, in Macedonia, a former *balneum* with its own *palestra* was partially occupied by the octagonal church's baptistery [13]. The *balneum* became smaller but continued to function as a bath-house, most probably operated by the Church, since its main entrance seems to be near the atrium of the ecclesiastic building. In Kos, an inscription mentioning the restoration of a bath-house, overseen by the *Hegoumenos* of an apparently urban monastery, is a clear indication of the role of ecclesiastic dignitaries as caretakers for the city's public amenities [14]. In Byllis, the relatively large city acquired several churches, three of them on, or very close to, its center. Among them, a small public bath-house is connected to Justinian's care, through a detailed inscription, but nothing in its size or grandeur compares it to imperial *thermae*, its simplicity lies in striking contrast to the scale and lavishness of the contemporary churches all around it [15,16].

Another interesting phenomenon is the conversion of bath-houses or their parts into churches [17]. This phenomenon, although extremely complicated both historically and archaeologically, seems to have strong roots in the perceptions about the Christianization of Roman society mentioned above. The hagiographical record endorses the view that in Thessaloniki, the basilica of Hagios Demetrios was

built over a Roman bath-house (apparently a great public one) because in the literature, a bath-house served as the setting for the saint's imprisonment and execution. The team of the site's first excavations labelled the substructures of the present basilica as a Roman bath-house in which they also identified a martyrium, and this interpretation persists in modern literature [17] (pp. 160–162). Recent investigations and more scientific analysis of the evidence called into question the veracity of this claim, revealing a far more complex history of the architectural remains of the church, including its substructure [18] (pp. 13–26). In Constantinople, the church known as Kalenderhane Camii has an interesting construction history involving numerous phases from Roman to the 13th century. One of the theories put forward by the investigation team involves a small (probably even private) Roman bath-house occupied by a 6th-century church which was eventually transformed into the 12th-century building that we see today [19] (pp. 31–36).

In Crete, a similar case is presented by the bath-house that was turned into the church of Hagios Demetrios in Viran Episkopi near Rethymno [20]. The overall conditions of this bath-house and its later fate is similar to the examples recorded in east Crete. Here, too, the complex is located close to a source of water—the river Arkadiotis—and the church is connected to a settlement called Episkopi. The similarity ends here, though, because the layout of the building is quite different. Another small bath-house of cross shaped plan was recorded by Gerola but more recent research could not identify its possible remains. This, too, has been connected to a much later church that was probably built on top of it. Yet both its exact location and its original dating are far from clear. The whole question of small bath-houses recorded by Gerola has been more recently explored by Kelly, in whose publication one can find the previous bibliography on the matter [21].

On the Cycladic island of Naxos, the conversion of a Roman bath into a small church was recently published [22]. In the church of Hagios Georgios, in Melanes, there is evidence of the materials, techniques and technology pertaining to its original use as a bath-house preserved in its fabric. It is situated in a ravine where it had ready-access to fresh water. It was transformed into a small chapel, although the dating of the conversion is far from clear. Apparently, the subject of baths converted to churches needs to be explored further and the publication by Kullberg ignores the instances we report here [17].

3. Bath-Houses and the Settlements They Belonged to

Returning to the subject of the bathing complex in Mochlos, one of the most important questions we are facing relates to its character: was it near a settlement and, if so, of what character? Since bathing in specially constructed buildings is considered a social phenomenon, it is only natural to question whether this bathing complex was in, or close to, a settlement. The question is far from simple since the placing of the bathing complex might depend, at least partly, on practical considerations. Therefore, even if it was connected to a settlement, it most probably was not placed at its center. Its placement in the lower part of a ravine can be explained by the need to collect water for its operation. If indeed it was connected to a settlement, it still may have been along its periphery. If the space occupied today by the small chapel of Hagios Andreas, a little further uphill to the east, was indeed a Christian Basilica, then this would certainly point to the existence of a settlement. In this scenario our bathing complex would serve this settlement's inhabitants. While its position would be in close proximity to its associated settlement, its site demonstrates a keener concern for access to fresh water, which could be stored in its cistern.

This observation can be applied to at least three other bath-houses recorded in east Crete where similar concerns for securing water supplies are evident [23,24] (Figure 15). All three are of similar scale and layout, as well as building technique. On the other hand, they differ from the two bathing structures we have excavated in Loutres, since the other examples were converted into churches, thus preserving a great part of the original fabric in the church walls.



Figure 15. Distribution map of Byzantine cross-shaped bath-houses in Eastern Crete. (Source: Google Earth).

All three are placed near ravines, a feature probably relating to the access of fresh water coming down from hills and mountains. Yet all are far from the sea, unlike the complex in Loutres and, therefore, if they served a settlement, this was also an inland one. Indeed, all three are related to settlements (today villages) that bear the highly suggestive name of Episkopi, a name that relates to bishoprics, an issue that we will discuss below. This could well be an indication for the existence of an important settlement, a town or city, which was the seat of a bishop. All three settlements are connected, both physically and through their name, to the big seaside cities of east Crete, Ierapetra and Siteia (Figures 16–18).



Figure 16. The cross-shaped bath-house converted into a church in Episkopi Ierapetras. (Photo: Ph. Stefanou).



Figure 17. The cross-shaped bath-house converted into a church in Kato Episkopi Siteias. (Photo: Ph. Stefanou).



Figure 18. The cross-shaped bath-house (two cross arms now demolished) converted into a church in Epano Episkopi Siteias. (Photo: Ph. Stefanou).

The name of these settlements—Episkopi—is a subject that has been discussed by several scholars, although there is no consensus on its meaning. For some scholars the name Episkopi found in inland areas is indicative of the transference of the population, along with its institutions, away from the coast, during the second half of the 10th century, due to the so-called Arab threat. This theory purports that these inland villages were named Episkopi because they became the seats of local bishops. Unfortunately, this hypothesis is not based on evidence from the written sources and projects a simplistic view of the ecclesiastic and political situation of Middle Byzantine Crete. The name Episkopi could better be explained if applied to areas where the church held numerous land-holdings which were worked by the villagers, a model previously proposed by Poulou-Papadimitriou [25] (pp. 321–323) [26] (pp. 40–46) [27] (pp. 270–275, 290–293). This could explain also the modesty in terms of scale and lavishness of these churches that are rather small and relatively poor to be considered as Cathedrals befitting a bishop.

What remains striking is the fact that the three establishments associated with this toponym in east Crete were transformed into churches, thus preserving their structural integrity, in contrast to the installations at Loutres. All are cruciform and vaulted, while their central space is covered with a dome [23,24]. These characteristics relate to their original function, making them highly suitable structures for conversion into churches. The same characteristics (the cruciform layout and the centrally positioned dome) acquired a symbolic value that made them suitable for church structures. In the process of their conversion, several alterations were made, most notably in their wall surfaces. Two acquired extra decorations in the form of blind arcading, brick-work and rosettes, most conspicuously on their domes and the cross arms. These additions enhanced the original layout, composed of cross-shape and dome, and transformed the intrinsic character of the buildings.

Judging from details in their fabric, especially the brickwork and the rosettes, we propose that they functioned as bath-houses in the Middle Byzantine period and transformed into churches after the 13th century, when these details were added [6] (Figure 19). It should be noted here that Mylopotamitaki and Katifori proposed earlier conversion dates but presented unconvincing arguments [23,24]. Mylopotamitaki dated the rosettes to the Middle Byzantine period, while Katifori also viewed them as part of the original structure; if considered alongside the inlaid brick crosses, however, the rosettes would be more appropriately placed in an ecclesiastical structure, rather than read as part of a bath-house setting. Both the transformation and its dating present interesting questions regarding the buildings' functionality.



Figure 19. Detail of brickwork and rosettes on the facades of the Kato Episkopi Siteias church (bath-house). (Photo: A. Tantsis).

If the original bath-house structures served a settlement, it was most probably a rural one, the inhabitants of which would have been highly engaged in agricultural production in the inland plains of both Ierapetra and Siteia. As already noted, it remains unclear whether these bathing installations were located within the settlement, as their precise location seems to be more acutely determined by a need for water over any desire to be the focal point of inhabited space. The name Episkopi, shared by all three villages now, could be an indication that these were estates of the bishopric and the villages were formed by the people who were working on them. If this were the case, then these bath-houses were connected to a rural settlement and formed part of its infrastructure.

The bathing complex in Loutres near Mochlos is unique despite obvious similarities. Firstly, it is close to the shore, indicating that the settlement it catered for was also coastal. Since the bath-house seems to have functioned roughly from the 8th to the 12th century, this would strongly suggest that any associated settlement was also active during this period. Such activity strengthens the idea that

even though the early middle ages are considered a period of hardship for Crete, due mainly to the Arab occupation of the island, its settlements, including coastal examples (as demonstrated here), continued to function. Narratives of Arab threat and piracy cutting off coastal communities and driving them from the shore persisted in the academic record for generations. The bathing complex at Loutres tells of a completely different story: one of continuity from the early middle to the late middle ages [6,28,29] (pp. 140–141). Our archaeological investigations in Crete allow us to propose that by the mid-7th through the 8th century, while the existing urban fortifications were reinforced in whole or part, at the same time coastal installations were set up at spots suited to keeping watch over the sea-lanes. As argued elsewhere by the current authors, the fortification of insular defenses must have been integrated in a well-organized system under state control [28–30].

The change in function of these bath-houses in east Crete is proof both of a repurposing of fate for all structures discussed thus far and, by inference, their associated settlements. In the case of the bath-houses that were turned into churches, this is most probably an indication of the relevant settlements expanding and surrounding these structures that at first were placed outside of the settlements and close to the place of collecting water. We might also suggest that an increase of demographics of these settlements produced an increase for the demand of fresh water and thus bathing was catered for in another place or in other, yet even less lavish, structures. Thus, the old bath-houses with their cruciform domed layout were deemed suitable for church conversion.

In Loutres, on the other hand, there was probably periodically an abundance of water (this possibly explains the enlargement of the cistern to store water also on its periphery). The cistern was the only structure still visible on the site before we began our excavations. Even in the secondary transformation and function of this structural space, demand for water remained high, as substantial quantities of water were also needed for the operation of the ceramic kiln. This transformation tells a different story regarding the position and the nature of the settlement until up to the 12th century. The discovery of a double bath-house would point to the relative importance of the associated settlement, especially if we consider that these amenities were rare in the Middle Byzantine period. In contrast, its transformation into an industrial space may indicate a shift in settlement focus, as such production is often located at a remove from domestic contexts, at least in rural settlements.

4. Conclusions

Bath-houses could be associated with both inland and coastal settlements where they maintained a particular position within both their social and geographical environment. While they were constructed close to natural water sources, they were also located within, or close to, inhabited areas and, consequently, can be informative regarding the topography of rural or semi-urban settlement (in this case within the context of east Crete in the Middle Byzantine period). The fact that the bathing complex at Loutres is located on the coast refutes popular claims that the shoreline was abandoned before or during the Arab occupation; on the contrary, its position reinforces narratives of continued coastal habitation throughout the Byzantine periods.

The study of these bath-houses, their construction and transformation, sheds much light on the significant cultural changes that Crete experienced in the 13th century. The examples transformed into churches are most likely to reflect demographic change and cultural shift within their immediate environment. In the area of Loutres, the presence and later transformations of the baths reveal significant fluctuations within the local settlement pattern where the buildings themselves serve as a lens through which we can study demographic trends and social practice through time.

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Article

The Economic Centrality of Urban Centers in the Medieval Peloponnese: Late 11th–Mid-14th Centuries

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Abstract: The Peloponnese, a province of the Byzantine Empire in the 11th and 12th centuries, was divided into three distinct political entities after 1204: the Frankish Principality of Achaia, the Venetian colonies of Modon and Coron, and the Byzantine lands in the southeast. The number and size of cities in the Peloponnese during the 11th and 12th centuries expanded, and the establishment of the new political entities of the 13th century did not hinder the development of its urban centers. New urban centers appeared, and the dynamics of the old urban centers witnessed a major shift. The focus of this paper is on port towns, since the majority of the available data derive from them, and aims to investigate the economic centrality of the port towns in the Peloponnese in the context of their environs, economic activities, and their position in the eastern Mediterranean exchange system. The theoretical framework is based on concepts of network theory, centrality, and economic complexity, as well as on a thorough evaluation of the material and textual evidence. In doing so, the economic profile of each central place is reconstructed, as well as a comparison between them.

Keywords: byzantine and medieval Peloponnese; byzantine and medieval port towns; central place theory; networks; economy; trade links

1. Introduction

The late 11th and mid-14th centuries in the medieval Eastern Mediterranean are marked by the cultural and economic transformation of the societies living on its shores. In particular, the 11th and 12th century witnessed the economic growth of the Byzantine Empire, the dissolution of the Byzantine Empire in 1204 by the fourth Crusade, and the establishment of the various Crusader States on its shores [1–3]. Moreover, the restoration of the Byzantine Empire in 1261, by Michael VIII Palaeologos, did not signify the recovery of all the Byzantine lands from before 1204 [4] (p. 804).

Interestingly, in the 11th and 12th centuries, the Byzantine Empire was the main export outpost for luxury items, such as ceramics, textiles, and glass, to Europe [5] (p. 740) but, by the late 13th century, the same region (now including the restored Byzantine Empire and Latin States) had become a large importer of manufactured products from the West [6] (pp. 185–216). The Peloponnese in Greece forms the focus of this study, due to its central position within these developments and its position in the center of the maritime routes between East and West (Figure 1).

This paper studies the impact of these wider developments in the Eastern Mediterranean by using the urban centers of the Peloponnese as case studies. The aim of this paper is to analyze the economic profile of each town and examine, empirically, their hierarchy, and the degree of their centrality between the late 11th and mid-14th century. This is the first time that the economic evolution of the medieval urban centers in the Peloponnese is approached, based on aspects of central place theory, network analysis, and economic complexity. Concepts of network theory will provide the tools to visualize relationships between settlements, and concepts of centrality will emphasize the economic and sociopolitical dynamics of each town, and reconstruct their hierarchy in the economic topography of the Peloponnese, while the concept of economic complexity will illustrate the variety

of the economic activities that took place in the Medieval Peloponnese and the way these activities interconnect with the concepts of centrality.



Figure 1. Map of the Eastern Mediterranean with important medieval urban centers (K. Ragkou).

2. The Environment of the Medieval Peloponnese

The Peloponnese is a typical Mediterranean landscape, with mountains often dropping into the sea resulting in a deep coastline; among these mountains, there are either small or large valleys [7] (p. 32). The Peloponnese is located in the southern part of modern Greece; to its west is the Ionian Sea, and to its east the Aegean. According to Campbell [8] (pp. 332–355), the climate conditions have not seen drastic deviations from the Medieval period to the modern times, though there were some periods with low temperatures and extreme weather events. Thus, in the Peloponnese, the climate must have been characteristically Mediterranean with a warm and dry summer from June to August, and a moist period during the autumn, winter, and spring, along with some cold and drought events within the year.

In the region there were agrarian, woodlands, and semi-natural areas, which encompassed high alpine plants and forests with pines and firs in the mountains [9] (p. 42). The agronomic zones were located along the river valleys and lowland plains, yet vineries and olive groves can also be found in dry regions [10] (pp. 18–20). Therefore, the agro-productive areas in the Peloponnese covered the plains of Argolid in the northeast, in Ellis in the northwest, and in Messene in the southern part. There are also agricultural areas in the river valleys of Laconia and Achaia, as well as arable and pastoral sectors in the eastern coastlands of Corinthia. In the mountainous districts, such as Arcadia, large terrains for the farming of cereals are unusual, but this type of environment is suitable for the cultivation of trees [7] (p. 32); hence, these districts must have been mainly used for stock-raising. Due to the climate and fertile zones of the Peloponnese, olives can be cultivated, as well as non-irrigated cereals, and grapes for wine production (Figure 2).

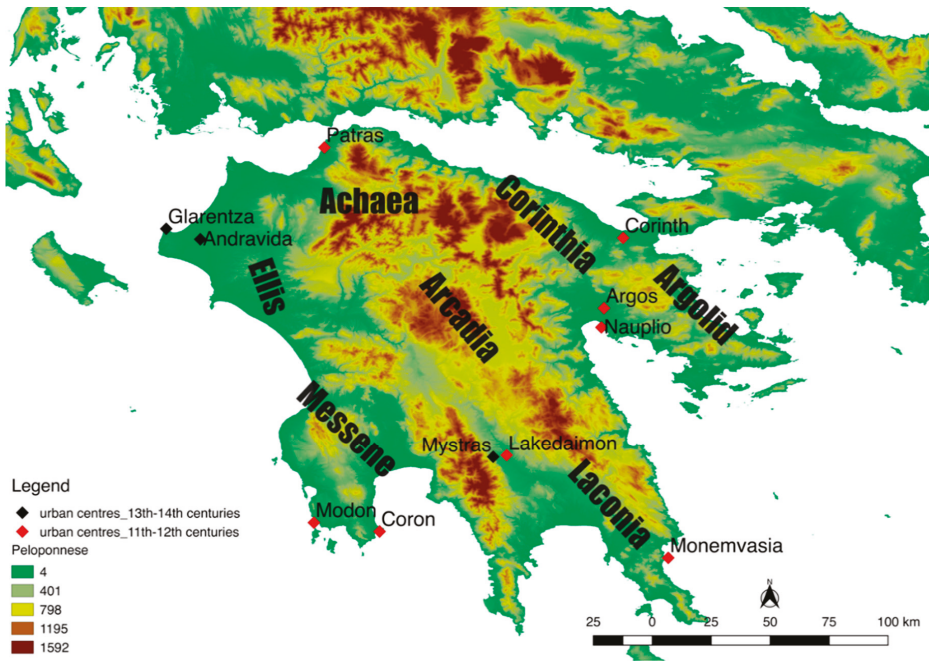


Figure 2. Map of the Peloponnese with its districts and medieval urban centers (K. Ragkou).

Near the natural harbors, significant urban centers were developed in the Middle and Late Medieval periods, which functioned as ports of outlet for the commodities and goods of the Peloponnese, and also as depositories for products shipped from the wider eastern Mediterranean. The city of Corinth had two ports, Lechaion and Kenchreai, which contributed greatly to its commercial activities during the period in question [11] (pp. 71–73). The port of Nauplion in Argolid, from the late 11th century onwards, became an important transshipment spot [12] (pp. 214–215). In the medieval period, the port of Patras in Achaëa was the first stop in the Peloponnese for ships travelling to and from the Ionian islands, Italy, and southeastern France [13] (p. 306). In Laconia, from the mid-10th century, the continuous advance of the port of Monemvasia is attested. The growth of Monemvasia, and its rise as an important urban center, was not hampered by the coming of the Latins and the conflicts with the Byzantines of the Despotate of Mystras [14] (pp. 883–884). Major port cities from the 11th century onward are also Modon and Coron in Messene [15] (p. 300), and their position in the maritime commercial roads escalated after their occupation by the Venetians in 1209 ([16], p. 154). In the northwestern Peloponnese, in the bay of Kyllene, the port town of Glarentza was founded in the mid-13th century by the Latins of the Principality Achaëa, and became its most important trade and economic center [17] (pp. 115–116), (Figure 2).

3. Historical Outline of the Medieval Peloponnese: Urban Centers and Settlement Patterns

The Peloponnese was a province of the Byzantine Empire in the 11th and 12th centuries and, after 1204, was divided into three distinct political entities: the Frankish Principality of Achaëa with Andravida as its capital, the Venetian Colonies of Modon and Coron, and the Byzantine lands in the southeast. The literary sources, from the period in question, use many terms to characterize a city. For example, Nicetas Choniates uses a variety of words in his *Χρονική Διήγησις*: πόλις (city), πόλισμα, πολισμάτιον, πολίχμιον, πολίχμη (township), μεγαλόπολις (large city/mega-city/megalopolis), μητρόπολις (metropolis), καλλιπολις (beautiful and ornamented city), ἄστυ (town), φρούριον (fort),

ὀχύρωμα (fortress), and κάστρον (castle). Thus, according to Choniates, a settlement is defined as urban, in the period in question, by its large size and dense population (megalopolis), its ornamentation and monumental buildings (kallipollis), its episcopal see (metropolis), and its circuit wall (fort, fortress, and castle) which served as protection for its inhabitants [11]. There are four identified metropolises in the Peloponnese from the late 11th century until 1204: the metropolis of Corinth, Patras, Lakedaimon and Argos [18] (pp. 138–158) which, according to Choniates, would make them the largest urban centers at the time. Moreover, the Arab geographer Al Idrisi, in 1154, mentions sixteen important cities in the Peloponnese, and the ones that have been identified are Corinth, Patras, Argos, Nauplio, Lakedaimon, Monemvasia, Modon, and Coron [19] (pp. 121–132).

In 1205, the Crusaders conquer the Peloponnese and create the Principality of Achaëa. They chose, as their headquarters, the northwestern part of the peninsula, and Andravida became their capital [20] (p. 107) (Figure 2). Andravida functioned as the administrative center of the Principality, which slowly loses its significance due to the construction of a new port town, Glarentza, in the mid-13th century [17] (pp. 115, 121–132). Modon and Coron came under the control of the Republic of Venice, and they function as key links and important centers of trade in the overseas dominions of Venice in the eastern Mediterranean [21] (pp. 6–9). In the battle of Pelagonia (1259), the princeps of Achaëa, William II Villehardouin (1246–1278), was captured, and subsequently released in 1262, after the concession of the castles of Mystras, Monemvasia, and Maina in Laconia to the Byzantines [16] (p. 83), [22] (pp. 15–25), [23] (pp. 122–125), [24] (pp. 228–230). The surrender of these three castles to the Byzantines, and the efforts of William II to regain control in the region, resulted in the desertion of the city of Lakedaimon, and the eventual migration of the majority of its population to Mystras and its slopes [25] (p. 224) (Figure 2). In 1289, Mystras became the seat of the Byzantine rule in the Peloponnese and, in 1349, the capital of the newly established Despotate of Mystras [22] and Monemvasia became the most important port of the Byzantine lands in the Peloponnese.

Consequently, the coming of the Latins and the reorganization of lands in the Peloponnese did not result in the abandonment of known urban centers from the 11th century and 12th centuries, with the exemption of Lakedaimon. On the contrary, there were two new important cities that rose in significance from the 13th century onwards, Mystras and Glarentza.

As for the settlement patterns for the period in question, all the surveys conducted in the Peloponnese (Figure 3) affirm the considerable number of rural sites between the 12th and mid-13th centuries, and their dispersed pattern of distribution in the landscape. From the mid-13th century, there is a shift in the settlement patterns, and a nucleated settlement system has been recorded [26–33].

The road system outlines patterns of human and economic interaction, though its realistic reconstruction for the Peloponnese for this period is not possible, since there is no map created for this period. However, there is no doubt that the urban centers of the Peloponnese were connected through land routes. The routes that early 19th century travelers, such as Leake and Gell [34,35], took were formed according to the natural barriers of the Peloponnesian landscape, passing through the plains, moving parallel to the rivers, and avoiding the mountainous interior by taking the passage through the coastal plains. Sanders and Whitbread analyzed the roads of the Peloponnese, based on the *Tabula Peutingeriana* map [36]. According to their analysis, the road network depicted in the *Tabula Peutingeriana* connects the major urban centers and port cities, while respecting the geomorphology of the peninsula [35]. It does not pass through the rough mountainous regions and the preference in coastal routes is obvious [36] and [37] (p. 195). It is possible that, during the Medieval Period, the main road system of the Peloponnese followed the same pattern.

The focus of this paper is exclusively on the port towns of the Medieval Peloponnese, and will explore the socioeconomic dynamics that triggered their significance and development based on concepts of network theory, centrality, and economic complexity. Thus, Lakedaimon/Mystras, Argos, and Andravida are excluded from this study, though they are close to productive agricultural zones and in proximity of port facilities, Monemvasia, Nauplion, and Glarentza, respectively. Unfortunately,

the lack of evidence does not allow the analysis of the hierarchical distribution of rural and urban sites in space, and the exploration of the spatial relationship of all the towns with their immediate environment.

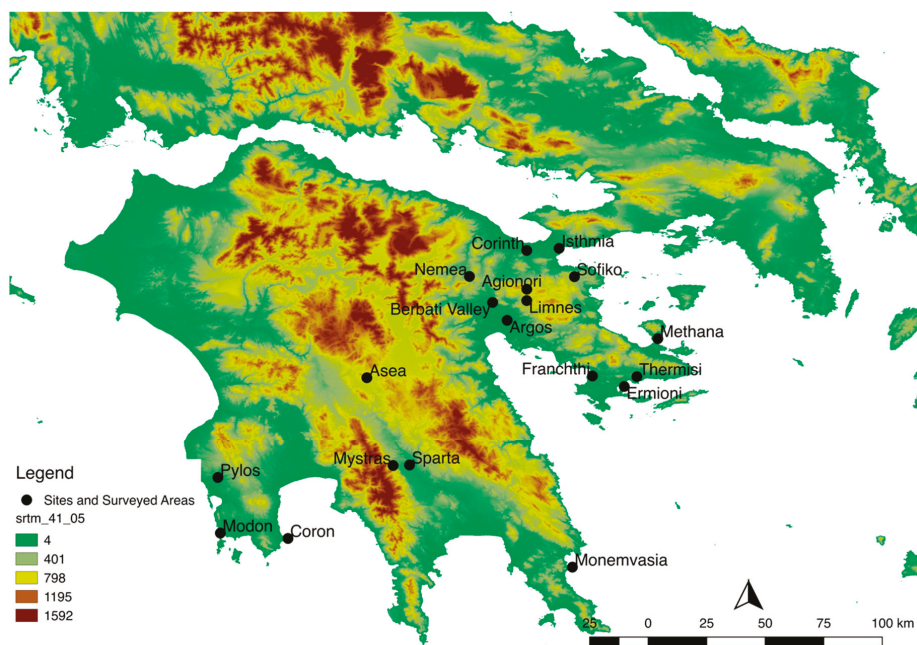


Figure 3. Sites and surveyed areas in the Peloponnese: 1. The Southern Argolid Survey: includes the valley between Franchthi and Ermioni, 2. The Methana Survey, 3. The Berbati-Limnes Valley Project, 4. The Eastern Korinthia Archaeological Survey: includes the region south of the Isthmus, 5. The Nemea Valley Archaeological Project: includes the territory to the west and South of Corinth, 6. Assea Valley, 7. Laconia Survey: includes the region East of Sparta, 8. The Pylos Regional Archaeological Project.

4. Economic Thought in the Byzantine Empire and the Crusader States: The Urban Economy and the Economic Structures of the Medieval Peloponnese

The main debate between the scholars exploring the Byzantine Economy and the economy of the Crusader States is whether it can be analyzed with terms of modern macroeconomics. The scholars arguing that the performance of the medieval economy in the Eastern Mediterranean cannot be studied in relation to modern economic theories are based on Finley's study [38–40]. Finley states that the study of past human societies and economies should not be approached through modern economic theories suggested by sociologists and economic historians, since the people in ancient societies did not put all their economic activities under the umbrella of an organized market, where the patterns of production and distribution respond to market forces, such as transportation costs, the cost of labor, supply, and demand [40]. Moreover, according to their point of view, the state was the main agent that gathered the surplus and reallocated it to the military and civil officials, while the towns functioned as consumption centers, and the money covered the necessities of the state. On the other side, there are the scholars who give emphasis to the existence of markets, and claim that economic exchange was at the center of the state's economy, and that money had an economic function [5,41–44]. In this aspect, as Laiou states, the economy in the Medieval Mediterranean can be viewed within the terms of modern macroeconomics, and what distinguishes it from modern economic systems is the level of advance [5] (p. 691). Carrié agrees that the distinction between the Medieval Economies and the modern ones is the rapidity of development [45]. Additionally, Laiou proposes that the three types

of Polanyi's economic integration—redistribution, reciprocity, and exchange [46] (pp. 35–36)—define not economies, but systems of exchange [47] (691–696). She also argues that there are two modes of exchange: (1) economic exchange, as has been described by Polanyi; and (2) non-economic exchange, which incorporates redistribution and reciprocity [47]. Laiou seems to think that, within a specific context, economic and non-economic exchange could have taken place in the Byzantine Empire. Temin reaches a similar conclusion, and argues that even in a market economy, there can be transactions outside the market [48].

In the 11th and 12th centuries, the basis of the economy of the Peloponnese is primary production that stimulates secondary production, thus, the regional economies of the Peloponnese are subject to primary production, and as manufacturing activities occur, interaction proliferates between them, and that is one of the main characteristics of urbanization [6] (pp. 190–208) and [49].

The archaeological record from the Peloponnese, and the limited written evidence for the attested cities of the Peloponnese present evidence for a variety of economic structures, which incorporated many different economic activities. Skilled artisans worked in various workshops specializing in ceramic, glass, and silk production; merchants offered goods, and most people were employed with agrarian activities.

Corinth functioned as the capital of the Theme of the Peloponnese from the late 8th century [50] (pp. 141–155), but was integrated into the Theme of Greece in the middle of the 11th century, with Thebes as the new capital [51] (pp. 91–92). Despite the alteration in its administrative rank, Corinth remained the administrative, trade, and economic center of the Peloponnese [51] (pp. 90–93). The systematic excavations of ancient Corinth, by the American School of Classical studies at Athens, have brought to light commercial buildings, domestic structures, workshops for ceramics, glass, and metal [52] (pp. 57–86), [53] (pp. 230–231), [54] (pp. 652–653).

Unfortunately, the rest of the port towns of the Peloponnese have limited archaeological data and written testimonies. However, industrial workshops have been identified in some of them—Patras, for example, was famous for its silk production [55] (p. 425), and ceramic workshops have been found in Argos and Sparta [56] (pp. 45–67) and [57] (pp. 233–236). Information for the city of Nauplion is also scarce, but it certainly was the commercial center of Argolid, especially after the 13th century and the coming of the Latins [58] (pp. 492, 675). It appears that shops and workshops were located in the lower part of the city of Monemvasia [14] (pp. 880–881). The only material remains from Modon and Coron are their fortifications [59] (p. 222), [60] (p. 137). Domestic units and workshops have not been preserved in Modon and Coron, and the lack of systematic excavations does not allow further conclusions. Still, there is evidence proving that, at least until the early 14th century, raw silk was being produced in Modon and Coron and exported to the West [61] (pp. 28–29) and [62] (pp. 419–420). Undoubtedly, Modon and Coron played a diachronically important role in maritime trade, and functioned as two of the most significant trade hubs of the Peloponnese, particularly after their occupation by the Venetians in the 13th century [63] (p. 125).

Glarentza is the only port town that the Latins erected from scratch. The written sources attest that the city accommodated workshops, hospices, and banks, and that the most important urban and economic center of the Principality of Achaea [17] (pp. 115–116) and [64] (pp. 90–95), though the old byzantine port towns, such as Corinth, Patras, Nauplion, etc., continued to flourish [17] (pp. 125–126). Nonetheless, the erection of Glarentza in the mid-13th century, by the Latins, shifted the economic center of the Peloponnese from the northeastern NE to the northwestern NW part of the Peloponnese (Figure 2). The significance of Glarentza as the most important economic center of the Principality, is most clearly demonstrated by the existence of its own mint, which cut *denier tournois* from ca. 1267 to 1353 [65] (pp. 209–253) and [66] (pp. 242–248). Possible explanations for choosing this part of the peninsula to settle include the large fertile plain of Ellis, and closer proximity to their homeland. It has been argued that the fates of Patras and Glarentza, under Latin Rule, was largely due to the interests of the Republic of Venice; Venice focused all its interests on Patras from the mid-14th century onwards, and Glarentza, which was already in decline, due to the advances of the Byzantines, deteriorated [67].

The commercialization of the rural products is evident from the 11th century onwards. Olive oil was being exported, since 1088, from the ports of Corinth and Monemvasia [68] (pp. 313–321). A record from 1182 tells of a ship from Nauplion carrying around 43,000 liters of olive oil from Laconia and, heading for Constantinople, was diverted to Alexandria, instead; this suggests that during the 12th century olive oil from Laconia reached regions outside the Byzantine Empire [69] (p. 235), [70] (pp. 326–327). Olive groves and olive presses, in both Latin and Byzantine territories, are attested in the 13th and 14th centuries, and their products continued to be exported in Constantinople, Venice, and Alexandria [69] (pp. 240–243), [71] (pp. 14–15, 76–77, 136–136, 250–251). The major ports for the exports of olive oil, in the 13th and 14th centuries, were Monemvasia [14] (pp. 889–892), Modon, and Coron [69] (p. 244). Interestingly, there is no evidence of olive oil exports from Glarentza, the most important port of the Principality.

There is no information regarding cereal cultivation in the Peloponnese for the 11th and 12th centuries, but grain was important for the self-sufficiency of the population and the feeding of the oxen, sheep, goats, and horses, as well as other domesticated animals. Although there are many suitable areas in the Peloponnese for its cultivation, produce during this time most likely covered only local needs. The total lack of information indicates that this product was not exported during these two centuries. However, there is plenty of information for the 13th and 14th centuries for the Latin and Byzantine territories [71] (pp. 45, 148–1499), [72] (p. 322). Mills for grinding wheat have been documented in the whole Peloponnese during these centuries [71] (pp. 72, 135–9), [73] (p. 103). Furthermore, there is evidence for the exportation of grain. In 1271, a load of wheat left from Glarentza to Crete [74] (p. 428); in 1340, cereals were transferred from Glarentza to Venice, Ancona, and Florence [64] (p. 299); in 1344, grain was shipped from Modon to Venice [75] (pp. 412–413); and in 1355, grain was exported from Patras. Imports of grain have also been proven between the 1270s and 1280s, from Sicily to Glarentza [64] (pp. 296–298), and in 1314, from Catania to Glarentza [76] (p. 182). This evidence suggests that cereal production in the Peloponnese was mostly distributed in local markets for the 11th and 12th centuries, and its cultivation was intensified from the 13th century onwards, which allowed the exportation of its surplus on some occasions.

Jacoby [69] (p. 249) suggests that winemaking in the Peloponnese, during the 11th and 12th centuries, was a household activity, and the surplus could be distributed to those who could not reach self-sufficiency, thus promoting a small-scale wine trade within the Peloponnesian peninsula. Vineyards and viticulture were all over the Peloponnese in the 13th and 14th centuries, as testified in the Latin and Byzantine written sources [71] (pp. 132–135), [77] (pp. 109–24), [78] (pp. 186–191, 194–195). The wine that was mostly exported outside the Peloponnese was the wine from the region of Monemvasia, the so-called *Malvasia* [14] (p. 890), [69] (p. 253), [74] (p. 322). In general, the exporting of the *Malvasia* wine towards East and West is attested for in the 13th and 14th centuries [69] (pp. 253–254). Another important Peloponnesian transit center of wine is located in Glarentza, although its cultivation origins cannot be identified. It could come from the region of Ellis, or another region within the Principality. Furthermore, Modon and Coron were functioning as outlets for Peloponnesian wine, which could have been produced in Messene or elsewhere in the peninsula [60] (pp. 257–601), [69] (pp. 255–256). Hodgetts [60] (p. 258) suggests that the majority of the wine came from the plains in Messene and Achaia. Imports of wine, from Crete to the Peloponnese, have been testified in the late 13th and early 14th century in Modon [74] (p. 427), at a time that both regions were colonies of Venice.

For the 11th and 12th centuries, there are no secure data for cotton growing in the Peloponnese. According to Lefort [79] (p. 252), during these centuries, cotton was produced in Crete and Cyprus. Jacoby [69] (p. 260) also states that during the 11th and 12th centuries, the cultivation of cotton was not introduced in the Peloponnese, though he mentions that there is a reference, from 1167, of a ship having at its cargo cotton and sailing from Corinth [69] (p. 192). The first testimony of cotton production in the Peloponnese comes from 1365 in the *castellania* of Corinth [71] (pp. 161, 167, 178, 188–91). Moreover, Nam [80] (pp. 185–186) argues that Venice started to encourage the growing of cotton in Modon and

Coron after 1350. However, there are indications that the port of Glarentza was used as a transmit point in the cotton trade from the late thirteenth century [80] (p. 244).

The significance of the secondary production in the Peloponnese, and the quality of their manufactured products in the 11th and 12th centuries, is attested through the ceramics and silk textiles. The Measles ware is considered to be a Peloponnesian production from a workshop at Corinth and/or Sparta [81] (p. 267). White, with her analytical work, has testified that the Measles wares found at Corinth are locally produced [82] (p. 109). This ware has been recorded in the Peloponnese, Italy, and Albania ([81] (p. 267) (Figure 4). Furthermore, the presence, permanent or not, of Venetian merchants, who were exporting silk textiles in the ports of Corinth and Sparta, has been testified since 1088 [83] (pp. 379–380).



Figure 4. The distribution of Measles ware (K. Ragkou).

Furthermore, from the late 11th century, the Peloponnese was part of the wider pottery trade system within the Eastern Mediterranean, as is attested by the vast number of imports of glazed White wares, most likely from Constantinople, Aegean, and Zeuxippus wares from unidentified workshops within the Byzantine Empire, though recent studies by Waksman and his colleagues, and Palamara and her colleagues, suggest that the majority of the Aegean wares comes from Chalkis [84,85], at Corinth [86] (pp. 385–400), Nauplion [12] (pp. 36–57) and Patras [87] (pp. 343–344) demonstrating the economic interaction of its port towns with the east. Interestingly, there are indications that the Aegean ware was also produced at Corinth, based on the wasters that were found, and the petrographic analysis conducted by White [82] (p. 115). From the mid-13th century, the majority of glazed wares belonging to Protomaiolica or Archaic Maiolica coming from Italy signify the connections of the Peloponnese with the West [12] (pp. 95–103), [13], [88] (pp. 401–422). All the material from the 13th to the mid-14th century in Glarentza and Patras originates from Italy, except for a brown glazed ware which most probably was produced in an unidentified workshop of the Islamic Anatolia [13], [89] (p. 48). Notably, at the same time, imports from Islamic Anatolia have also been recorded at Corinth [90] (pp. 168–170). The ceramic spectrum in Modon contains green and brown painted wares dating to the 12th century, slip and painted wares from the mid-12th to the mid-13th century, as well as Incised Sgraffito wares and Zeuxippus wares dating between the mid-13th to the mid-14th century [91]. Kontogiannis and

Aggelopoulou [59] studied the pottery that was discovered in Modon from site-cleaning in the 1990s, and state that the fragments dating to the 13th and 14th centuries are “only a handful”, and there are no Italian imports. Unfortunately, the reports from Coron and Monemvasia do not provide secure information on their ceramic finds. According to Kalamara [92] (p. 51), there are no records of Italian imports at Monemvasia.

There are coin reports only from two of the port towns of the Peloponnese, Corinth (Figure 5), and Glarentza (Figure 6), which prove the importance of these ports in the international trade networks. According to Penna [93] (p. 212), from Corinth, more than 6000 coins have been published dating this period, as well as fourteen hoards; five of them date from the reign of Alexios I (1081–1118), one from the reign of John II (1118–1143), and five from the reign of Manuel I (1143–1180). Interestingly, three of the hoards had coins coming from non-Byzantine territories: one had 119 coins of the Bishops of Clermont, one of the Bishops du Puy, and one gold coin of Alexios I [93] (p. 212), [94] (p. 11); another hoard was found in the east parodos of the Roman theatre, and had six *folles* and sixty-five bronze Seljuq coins [93] (p. 212); the third hoard included nine coins from Valence, and five from Lucca [93] (p. 212), [95] (pp. 99–100). Since the Byzantine authorities allowed only the use of Byzantine issues, the concealment of these hoards does not necessarily indicate transactions with a foreign currency at Corinth. Most likely, these hoards belonged to travelers who stored their savings in times of danger [93] (p. 212). Nonetheless, the existence of these foreigner hoards affirms the international position of the city of Corinth, and its connection through maritime and trade routes with the west, the Crusader states on the Syro-Palestinian coast, and the Islamic East. From the early 13th century, the coins found at Corinth come from the West, such as English sterlings, French *deniers tournois*, and coins from the Kingdom of Naples, dating to the first half of the 13th century (Figure 5). From Glarentza, there are no records for French *deniers tournois*, and the majority of the coins were cut in its own mint [66] (pp. 271–277) (Figure 6). Venetian coinage has a strong presence in Corinth and Glarentza from the mid-14th century (Figures 5 and 6), a period when the mint in Glarentza had closed, and the markets of the Peloponnese were consuming Italian ceramics [96] (pp. 170–171). It is possible that the large amounts of Venetian coinage met the need for cash during this period, resulting from the lack of coins created by closing the mint in Glarentza.

Therefore, it seems that the administrative changes with the coming of the Latins in the 13th century did not hinder the economic developments within the urban centers, commerce and manufacturing activities continued, and the exploitation of countryside was intensified [6,96]. Though, as we have seen for the 13th and 14th centuries, the records from the Peloponnese attest to the sole exportation of agricultural goods, indicating that the secondary production could not meet the requirements to supply both local and international markets. Pottery kilns and wasters, dating from the 13th century onwards, have been identified in the surveys in the Nemea Valley and Berbati Limnes [29] (pp. 48–49), [33] (pp. 406, 414–415) signifying the existence of workshops that covered the needs of the local population.

To conclude, this section presented the economic approaches for the study of the Medieval economy, as well as the various economic activities that took place in the port towns of the Peloponnese, and how they were affected by the political–territorial changes in the wider Eastern Mediterranean and the Peloponnese itself. The evidence constitutes a sample of a record of human economic behavior; nonetheless, the division of labor is apparent, and the importance of trade, manufacture, and agricultural production in the complex economic system of the medieval Peloponnese is denoted. There is primary production that exceeds local or regional demand, while the secondary production, even if it was not intended for a large industrial scale, reaches regional and international markets. Lastly, the data from the Peloponnese for the period in question support the notion of Laiou, concerning the two modes of exchange—the economic and non-economic—that can be used at the same time and place, based on the circumstances. Thus, aspects of modern market economy can be seen in the economy of the medieval Eastern Mediterranean, and the application of modern macroeconomics should be approached with great caution.

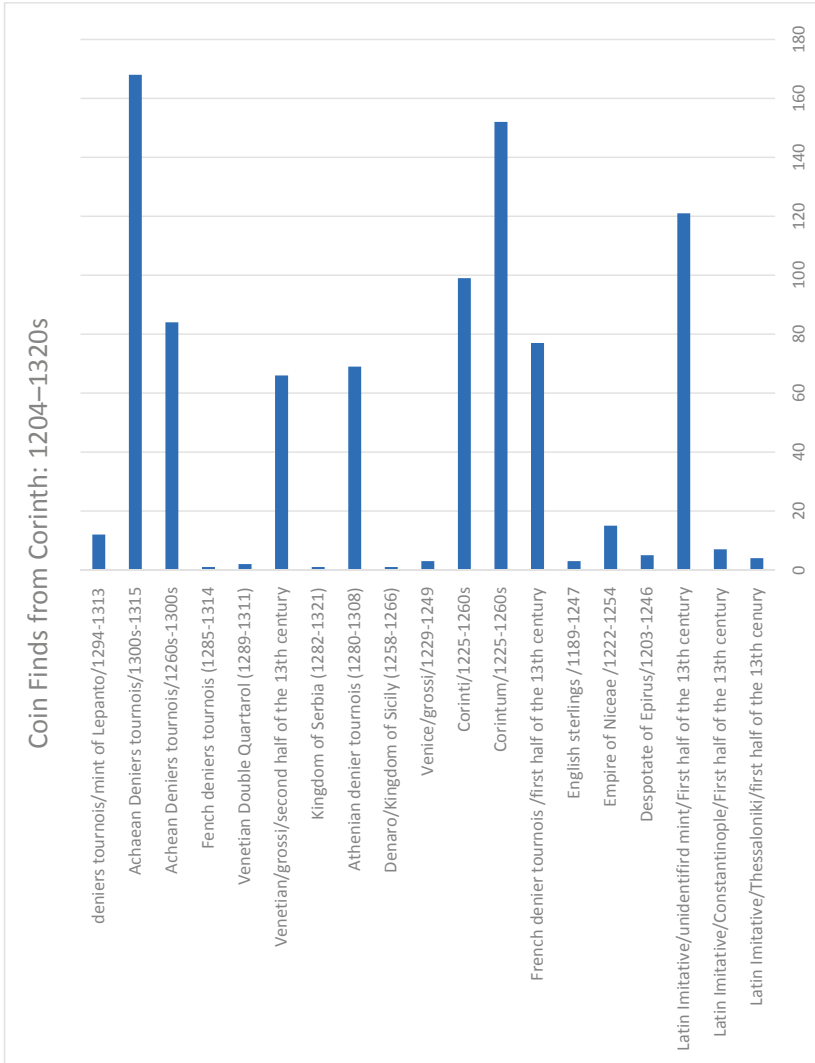


Figure 5. Single coin finds from Corinth: 1204–1320s, based on published reports from the excavation of the American School of Classical Studies at Athens (K. Ragkou).

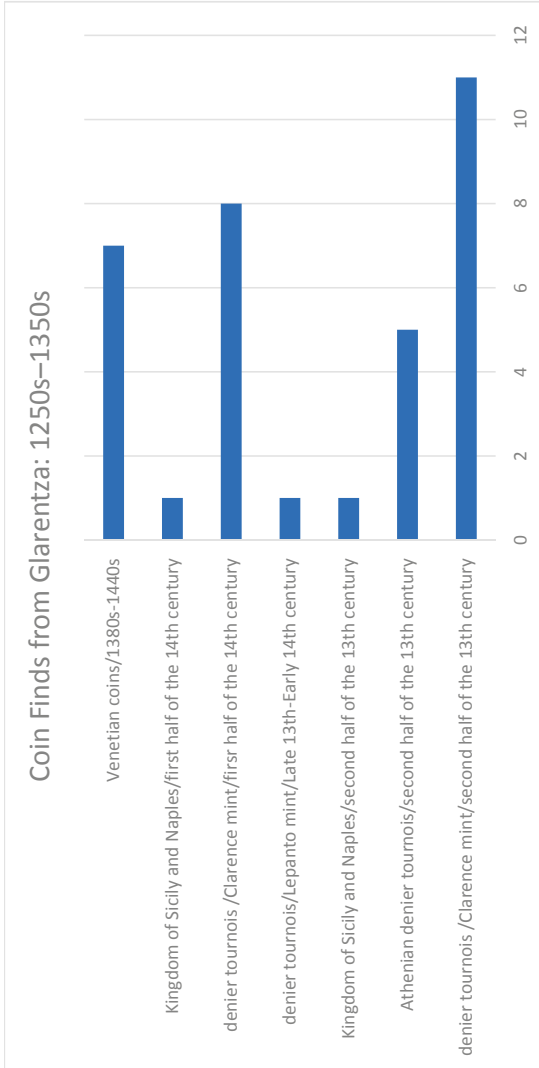


Figure 6. Single coin finds from Glarentza: 1250s–1350s, based on the report of Athanasoulis and Baker [66] (K. Ragkou).

5. Networks: Closeness and Betweenness Centrality

Networks can be defined, very simply, as sets of people or things with connections between them, commonly referred to as “nodes” and “links”, respectively. The nodes used in network analysis, in this article, are the castles of the Peloponnese, since the castles were the cornerstones of the settlement system of the Medieval Peloponnese [97] (Figure 7). The links between these nodes are difficult to identify, since the limited excavation record and written sources do not provide a clear picture for all the likely connections between the sites. For this reason, I decided to use nearest-neighbor networks to demonstrate how local and regional networks are shaped between sites. The basis of the created models is the assumption that the sites interact with at least three of their nearest neighbors.

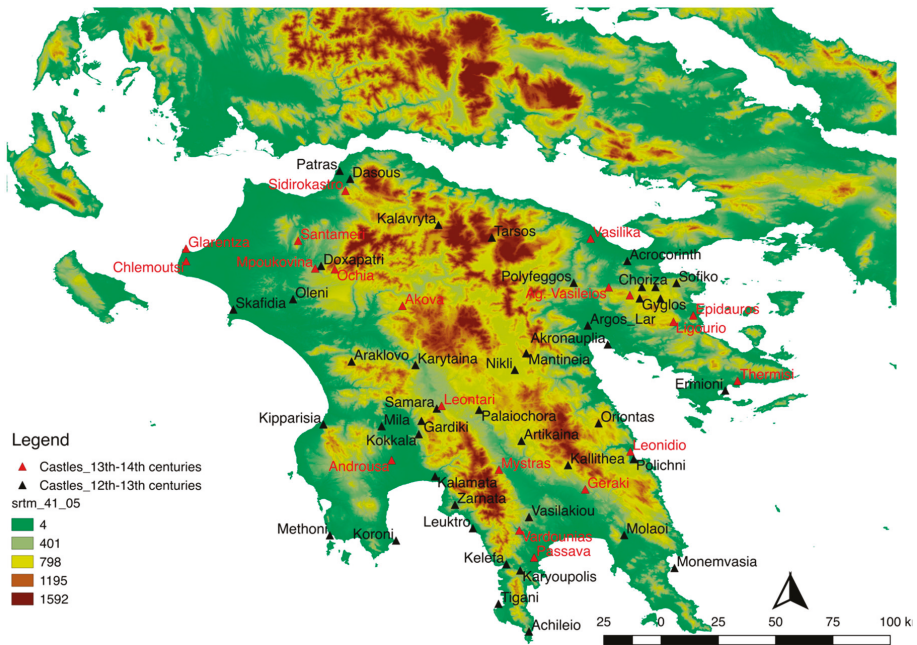


Figure 7. The castles of the Peloponnese from the 12th to the 14th centuries (K. Ragkou).

Closeness and betweenness centrality are the concepts of network theory that are applied in the created models. On the one hand, closeness centrality underlines the importance of the distance in a network, since the closeness of a node is the distance of the node to all the other nodes in the network, indicating that nodes with high closeness can get to all the other nodes of the network quicker than nodes with low closeness [98] (pp. 61–62). On the other hand, betweenness centrality highlights the number of times a node acts as bridge on the shortest path between two other nodes. Therefore, nodes with high betweenness imply their significance regarding their connection between other nodes, and their role as congestion points in the network [99] (pp. 129–130). The betweenness centrality of a node is measured by color: the bluer the node (Figure 8), the greater the betweenness centrality; the redder the node (Figure 9), the greater the betweenness centrality, while the closeness of a node is measured by size—the larger the node, the greater the closeness centrality. The models that have been created are undirected, since the links between the nodes cannot be identified. Moreover, these models are simply a mere perspective of the reality and do not depict the actual connections between the various castles, since they have been stimulated by a hypothetical scenario. However, they visualize

possible interactions between the castles and the regions of the Peloponnese, and how these might change over time in the face of shifting settlement patterns.

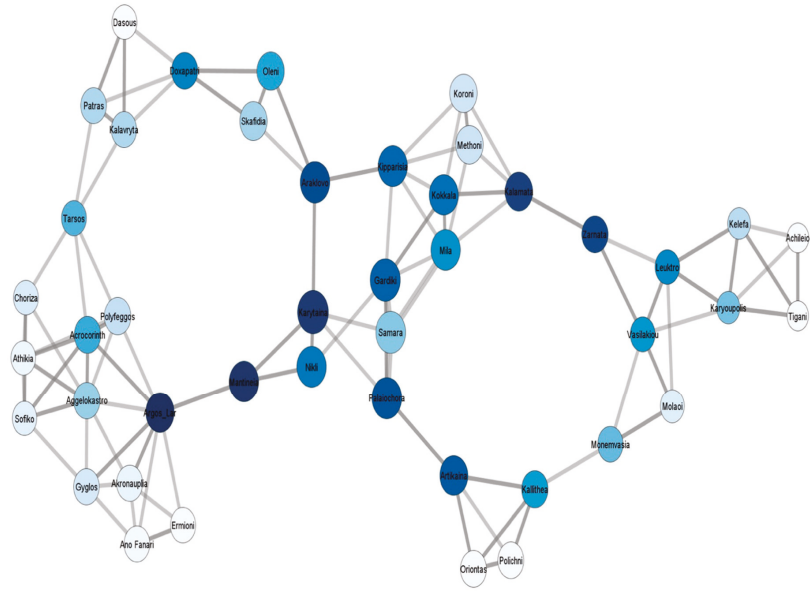


Figure 8. Nearest-neighbor networks of the castles of the Peloponnese, 12th to 13th centuries (K. Ragkou).

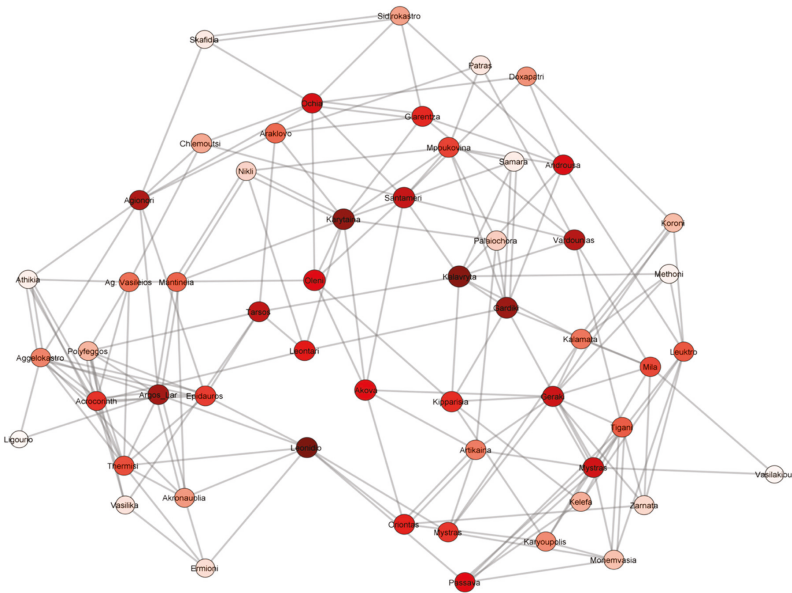


Figure 9. Nearest-neighbor networks of the castles of the Peloponnese, 13th to 14th centuries (K. Ragkou).

The port towns of the Peloponnese do not control important crossroads of the road system; hence, it is not surprising that this kind of analysis shows that they played a minimal role at an interregional level. Therefore, network concepts alone cannot be used for the exploration of the hierarchy of the port towns and the reconstruction of their economic profiles. Aspects of central place theory and economic complexity can supplement these models and help us grasp the functions of the port towns and their significance in the settlements of the Peloponnese.

6. Central Place Theory and Economic Complexity

Central place theory and the relating concept of centrality was originated by Walter Christaller in 1933 [100], and was translated into English by Baskin in 1966 [101]. In simple words, a central place is a site which offers one or more services for the people leaving around it [100], [102] (p. 47). A settlement is not a prerequisite for a central place; it can also include a group of establishments that provide various products or functions to a small market [103] (p. 1307). Christaller [100] divides central places into two categories: the higher-order centers and the lower-order centers. The higher-order centers provide specialized functions (e.g., health care, public transportation, etc.), while the lower-order centers provide basic functions (market, religious institutions, etc.). Furthermore, Christaller [100] (pp. 77–83) noted that central places can be arranged into three different systems, in order to explain possible patterns of their distribution: the marketing, the transportation, and the administrative system.

Christaller's marketing system states that the minimum number of central places that are required to function in an area is expressed as the *K-3* principle. Thus, market areas are three times larger than the subsequent lower-order one [100] (pp. 77–79). The transportation system is based on the fact that the allocation of central places is generated by the main transport routes that connects them with the higher-order center, and is expressed as *K-4* principle. Hence, there are four direct lower-order centers in contrast to the three linked to the marketing system [100] (pp. 79–81). In the administrative system, the markets of the lower-order centers are included within the markets of the higher-order center, and is expressed as the *K-7* principle, thus, the six lower-order centers are linked to the higher-order center, and they, in turn, predominate the seven markets of the following lower level [100] (pp. 82–83). The marketing and transportation system are based on the location of a place and its immediate relation with resources, its hinterland, and maritime connectivity. The administration system is controlled by the human factor, and its efforts to concentrate as many services as possible in a center.

Nakoiz, in a recent study, investigates the diverse perceptions of central place research in archaeology [104]. According to him, central place research in archaeology can be used to identify central places, study the structure of settlement patterns, analyze the hierarchy of settlements, examine the processes of centralization of a site, and reconstruct the settlement systems of a region [104]. Moreover, Knitter's and Nakoiz's article, in this volume, analyses, in an explicit way, various concepts of centrality, and present methods to supplement the limitations of Christaller's theory [105]. For this paper, in order to rank the port towns of the Medieval Peloponnese based on their centrality, and characterize them as higher-order or lower-order centers, Christaller's central place theory is supplemented by the study of Gringmuth-Dalmer [106]. Gringmuth-Dalmer [107] (p. 8) outlines five central services that exemplify central places in premodern times: (i) administration; (ii) safety; (iii) manufacturing; (iv) commerce; and (iv) religious. The combination of central place theory with the five central services will allow the assessment of the hierarchy of these port towns, highlight their dynamics, and supplement the results of the network analysis.

Economic complexity is based on complexity theory, which studies the way that systems adjust by elucidating how the interaction between parts of the system result in collective behavior and formation, as well as how a system interplays with its environment [109] (pp. 97–104), [109] (pp. 573–601). Particularly, economic complexity in premodern societies cannot follow a strict definition or set of attributes. However, it can be used to describe the multiple interconnections of various economic structures [41]. These multiple interconnections are usually described in the form of networks [108], hence, economic complexity can be characterized as a system of networks that incorporates a variety

of microscale mechanisms, which interact with each other, initiating the rise of macroscale economic behavior. These microscale mechanisms can be related with social structure, in which the components are people, institutions, and patterns of customary relationships. Institutions can signify family, religion, law, politics, or economic interactions, and are intersected and inter-reliant, and, together, represent the social hierarchy of a society [110] (pp. 63–173). Economic complexity can be used to interpret the interconnection of diverse economic activities with the three systems analyzed by Christaller, and the basic five central services of Gringmuth-Dalmer.

The use of this theoretical framework, despite its shortcomings due to the limited data, will allow us to examine the evolution of the port towns and recognize the environmental, historical, cultural, and economic processes which cause different settlements to have varied levels of centrality for the period in question, and provide an insight to the complex economic realities of the Peloponnese.

7. Discussion

The analysis of the historical processes and the economic structures of the Peloponnese indicates that some of the port towns of the Peloponnese demonstrate parallel developments, but present different degrees of centrality. In the formal central place theory [100] the higher-order centers offer specialized services to their population, and the lower-order centers basic services. It is impossible to distinguish these in pre-modern societies. Therefore, the five central services (i. administration; ii. Safety; iii. Manufacturing; iv. commerce and v. religious) of Gringmuth-Dalmer [106] will be used to understand the economic centrality of each port town. The towns that have at least four of the central services are considered to be higher-order centers, and the ones that have three or less are regarded as lower-order centers. In cases where they share the same central services, the degree of their centrality is going to be defined based on the available data, and on the way they are incorporated into the three systems identified by Christaller [100] (pp. 77–81): the administrative, marketing, and transportation system. As has been mentioned above, the data are incomplete, thus, this kind of approach provides an insight to the complex economic system of the Medieval Peloponnese and interprets the economic dynamics of each port town through concepts of centrality.

All of the port towns for the period in question are either fortified, e.g., Glarentza [81] (p. 26), or they are connected with a castle, e.g., Corinth and Acrocorinth, etc., [12] (pp. 21–24), [111] (p. 136), [112]. Therefore, all of them possess the safety service. Furthermore, all of them are ornamented with churches, offering the population the possibility to practice their faith; hence, their role in the ecclesiastical hierarchy is the variety that asserts the degree of their religious service.

During the 11th and 12th century, although Corinth was no longer the capital of a Theme, it still functioned as the administrative center of the peninsula, and also played an important part in the Orthodox Church as one of the oldest metropolises of the region [18]. Moreover, it possessed various manufacturing workshops and had commercial contacts within the Byzantine Empire, and beyond, from the 11th century onwards (Table 1). The coming of the Latins in the 13th century, and the choice to settle in the NW part of the Peloponnese, made Andravida and, later, Glarentza, the administrative center of the Principality, and caused the loss of this service from Corinth (Table 2). The Archbishop of the Catholic Church, in the Principality, had his seat in Patras, and Corinth was one of his bishoprics [113] (pp. 300–302), resulting in the diminishing of the religious service of Corinth. However, Corinth remained an important manufacturing center [114], and its port continued to flourish in the 13th and 14th centuries. The exportation of agricultural goods from its port, the imports of Italian ceramics in the city, and coin issues from various authorities that have been found at Corinth, attest that the commercial contacts and economic strength of Corinth did not deteriorate.

Table 1. The port towns in the 11th and 12th centuries with their central services. The reconstruction of their hierarchy is based on the degree of their centrality, based on the available data and their analysis in the Discussion section. They are considered as higher-order centers if they have at least four central services.

Port Town	Administration Service	Safety Service	Manufacturing Service	Commerce Service	Religious Service	Higher-Order Center	Lower-Order Center
1. Corinth	X	X	X	X	X	v	
2. Patras		X	X	X	X	v	
3. Monemvasia		X	X	X	X	v	
4. Nauplion		X		X	X		v
5. Modon		X		X	X		v
6. Coron		X		X	X		v

Table 2. The port towns in the 13th and 14th centuries with their central services. The reconstruction of their hierarchy is based on the degree of their centrality, based on the available data and their analysis in the Discussion section. They are considered as higher-order centers if they have at least four central services.

Port Town	Administration Service	Safety Service	Manufacturing Service	Commerce Service	Religious Service	Higher-Order Center	Lower-Order Center
1. Glarentza	X	X	X	X	X	v	
2. Patras		X	X	X	X	v	
3. Monemvasia		X	X	X	X	v	
4. Corinth		X	X	X	X	v	
5. Modon		X		X	X		v
6. Coron		X		X	X		v
7. Nauplion		X		X	X		v

Nauplion owes its prosperity, during the 11th and 12th centuries, to its function as a port of the city of Argos. There is no evidence available regarding workshops in Nauplion, and the city is not a metropolitan seat. However, its port was a part of the wider trade network of the Eastern Mediterranean, as the imports of byzantine wares from regions outside the Peloponnese and its role in the exportation of Laconian oil in the late 12th century testify. In the 13th and 14th century, the degree of the trade service seems to have intensified, since there are ceramic imports from Byzantine and Italian workshops [12]. Concerning its religious centrality, there is no change attested from the 11th and 12th centuries.

The city of Patras in the 11th and 12th centuries served as a metropolis in the Orthodox Church, though on the *Notitiae Episcopatum* *notitiae episcopatum* is in a lower position than Corinth [18] (p. 42). Furthermore, there is evidence of industrial workshops, and its port was thriving due to its position in the maritime routes, thus, the city had the commerce and manufacturing service [57,89]. From the 13th century onwards, the interest of the Venetians in Patras augmented its commerce service, and there are indications that agricultural products from the Peloponnese were exported from its port, plus the ceramics found in Patras verify that the city had connections with Italy [13]. Moreover, Patras was, from the 13th century onwards, the most important religious center of the Principality, due to its upgrade to archbishopric [113] (pp. 300–302).

Monemvasia, in the 11th and 12th centuries, prospered as the main port of Laconia. Workshops and shops have been identified in the lower part of the city from the 11th century onwards. Olive oil was being exported from Monemvasia from the late 11th century, and the exportation of olive oil intensified from the 13th century onwards [14]. With the prevalence of the Byzantines in Laconia after 1261, Monemvasia was elevated to a metropolis, in fact, it was the most important metropolis of the Byzantine lands in the Peloponnese [115] (pp. 94–95), though the administrative center was Mystras. Thus, the religious service of Monemvasia was strengthened from the second quarter of the 13th century.

Modon and Coron, in the 11th and 12th centuries, had a low degree of centrality, since the central services that can be aggregated from the available data are the safety, religious, and commerce service

(Table 1); this changes from the 13th century onwards, when they become the colonies of the Republic of Venice (Table 2). Their religious service is intensified, due to their promotion as bishoprics of the Catholic church. Furthermore, their commerce service is escalated, since there is secure evidence for exportation of olive oil, wine, and grain from Modon and Coron [69] (p. 244). It is difficult to clarify which of these two cities has a higher degree of centrality, since the archaeological data, especially from Coron, are scant. However, as it has been mentioned in the previous section, the written sources make references mostly to Modon, and according to Gertwagen [63] (p. 125) Modon's location was strategically more advantageous than the one of Coron.

Glarentza is a city that was established in the mid-13th century, and owes its evolution into a major commercial transshipment port, due to the natural bay in the area and the rise in political importance of the northwestern part of the Peloponnese. Glarentza gradually became the administrative center of the Principality, and its commerce service is highlighted by the imports and exports of agricultural goods, the vast numbers of Italian ceramics discovered in the city, the existence of a mint that cut *deniers tournois*, as well as the coins found from other various authorities that have been recorded [89].

From the above analysis, there are some points that can be extracted. There is no doubt that, for the 11th and 12th centuries, Corinth has the highest degree of centrality from all the port towns of the Peloponnese, since it integrates all five central services, and all three systems of Christaller's are combined in the city's function. Therefore, Corinth is considered to be a higher-order central place. The second port town hierarchically in centrality is Patras, which is also considered as a higher-order central place as it covers four of the central services: the safety, commerce, manufacturing, and religious service. Patras comes second because it lacks the administration service, and is in a lower position of Corinth in the ecclesiastical hierarchy of the Orthodox Church. Monemvasia is also a higher-order place, since it shares the same services with Patras. However, Monemvasia is not a metropolis, hence, it comes third in rank because its religious service is lower than the one of Patras. The rest of the port towns of the Peloponnese can be characterized as lower-order central places, because they meet three of the central services. Nauplion, Modon, and Coron hold the safety, commerce, and religious service, but Nauplion has a higher degree of the commerce service, since its port was used for the exportation of olive oil in lands outside the Byzantine Empire. Thus, Nauplion follows Monemvasia in the hierarchy and, in the last two positions, there are Modon and Coron, respectively. Lastly, Patras, Nauplion, Modon, and Coron combine two of Christaller's system, the marketing and transportation (Table 1).

The sociopolitical changes in the Peloponnese and the eastern Mediterranean caused the reorganization of economic networks, and the urban spaces of the Peloponnese needed to adapt to the new conditions. The emergence of Glarentza, and the reorganization of the religious institutions by the Catholic church, as well as the predominance of the Byzantines in Laconia, triggered changes in their central services and the degrees of centrality of the port towns of the Peloponnese. There are four port towns that can be regarded as higher-order centers: Glarentza, Patras, Monemvasia, and Corinth (Table 2).

Glarentza is now first in the hierarchy because it covers all five basic services, and possesses all three systems of the central place theory, while all the rest port towns of the Peloponnese integrate only the marketing and transportation system. The archbishopric of the Catholic Church is in Patras; hence, Patras has the highest degree of the religious service. However, it comes second in rank because it lacks the administration service, and combines only two of Christaller's system. Monemvasia comes third in rank, though it covers the same central services as Patras (Table 2) and they both share the same degree of the religious service, since it has become the most important Orthodox metropolis of the Peloponnese. They both function as important ports, and are used for the exportation of the agricultural goods of the Peloponnese, but it seems that Monemvasia is not part of the pottery trade network of the 13th and 14th century, due to the lack of ceramic imports from the West and East; thus, Monemvasia's commerce service is in a lower level than the one of Patras. Furthermore, when looking at the urban topography of the Peloponnese as a whole, Monemvasia holds the third position, but in the region of the Peloponnese occupied by the Byzantines, it has the second position after Mistras,

which serves as the administration center of the Despotate of Mistras. Corinth continues to be a higher-order center covering four of the five basic services, but now it ranks fourth. Corinth lacks the administration service, and its religious service is in a lower position than the one of Patras and Monemvasia. Modon, Coron, and Nauplion integrate three of the five central services, thus, they are characterized as lower-order centers. Modon and Coron are above Nauplion because their churches have been upgraded to bishoprics of the Catholic Church, making their religious services higher than the one of Nauplion (Table 2).

Interestingly, in the mid-14th century, the political–territorial organization of the Peloponnese was altered once again. The Byzantines managed to expand their territories, and the Principality of Achaëa was then limited to the northwestern part of the Peloponnese. It seems that the majority of the port towns of the Peloponnese managed to adjust, but Glarentza gradually fell into ruin. Its location was appropriate for the founding of a port town, but it took the political initiative of the Principality of Achaëa for Glarentza to become its administrative and economic center. The loss of that role, due to the political deterioration of the Principality and the refocusing of interests of the Venetians to Patras, caused the decline and the gradual abandonment of the city. Thus, the human factor had a vital role in Glarentza's fate. The other port towns of the Peloponnese were definitely affected by the sociopolitical changes in the Peloponnese and in the wider eastern Mediterranean, but it seems that they were able to adapt, and although their central services were altered, they did not deteriorate completely.

8. Conclusions

The port towns of the Peloponnese diachronically linked the peninsula with regions within the Byzantine Empire and beyond. They were located in strategic locations, since they could reach distant markets and obtain objects and goods from regions outside the peninsula, but they were also connected with the resources of their hinterlands. The commercialization of the rural products and the investigation of the ceramic spectrum of the Peloponnese, in juxtaposition with the single coin finds and the identification of manufacturing workshops, wherever possible, reflected the size and dynamics of their markets, and signified the opportunities for specialization in the division of labor. The analysis of their economic structures resulted in the description of their economic profiles and elucidated their resemblances and differences. Aspects of network analysis highlighted the possible connections of the castles and the regions of the Peloponnese, though the created models could not demonstrate the centrality of the port towns of the Peloponnese, due to their location away from the main crossroads of the Peloponnese. The limitations of these models were supplemented by concepts of central place theory in association with the Gringmuth-Dalmer's five central services. The interpretation of the port towns of the Peloponnese, with concepts of centrality, highlighted the services that they offered in their inhabitants and their hinterlands, and suggested their importance in the economic topography of the Peloponnese before and after the coming of the Latins in 1204. To sum up, this kind of approach provided the qualitative analysis of the economic centrality of the port towns of the Peloponnese, elucidated aspects of their complex economic systems, and allowed the diachronic evaluation of their economic profile.

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