THE DISCIPLINARY LANDSCAPE

VIOLENCE, FORTIFICATION, AND THE MAKING OF POLITICAL SUBJECTS IN THE CYPRIOT BRONZE AGE

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The Disciplinary Landscape:

Violence, Fortification, and the Making of Political Subjects in the Cypriot Bronze Age

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The research presented in this dissertation considers the sociopolitical efficacy of a group of fortresses that were built during the transition from the relatively insular and egalitarian village-based society of the Early and Middle Cypriot Bronze Age, to the urban, regionally-connected polities of the Late Cypriot Bronze Age. I argue that these fortresses should not be understood only as symptoms of political transformation, but are instead active participants in the restructuring of Cypriot society. I advance the theory that fortresses are best understood as a hybrid assemblage of things and landscape that makes up a special kind of Foulcauldian apparatus. Through the operation of defensive, monumental, and disciplinary techniques, this apparatus generates a *disciplinary landscape* through which authority is represented and social inequality is experienced and apprehended, and by which subjects and territories are produced.

A review of the study of fortresses reveals the problems they have posed in archaeological analyses, and the changes in interpretation of the Cypriot fortresses that have occurred over time. Evidence for increasing violent conflict during the Bronze Age, counter to the recent pacification of Cypriot prehistory, provides

context for the fortresses' construction. The main case study of the dissertation is then presented: a cluster of four fortresses in the central Mesaoria plain of Cyprus: *Barsak*, *Glykia Vrysi*, *Kafkallia*, and *Nikolidhes*. Under the auspices of the Agios Sozomenos Excavation and Survey Project of the Cyprus Department of Antiquities, I assisted in excavations at *Barsak* and *Nikolidhes* and completed a regional survey, the preliminary results of which are included in this study.

The main analyses are then presented in two parts, divided by the scale at which the efficacies of the fortress apparatus are generated, namely that of the structure itself, and the structure within the landscape. First, I consider how architectural form and features produce defensibility. I use architectural energetics calculations to demonstrate how the labor and material investment in construction created monumental structures, and analyses of spatial syntax and architectonics show how the fortresses experiment with different ways to control space and movement.

Finally, I investigate the operation of the fortress apparatus in the landscape, particularly its role in processes of surveillance and territorialization. GIS analyses of prominence, intervisibility, and movement explore how the apparatus generates disciplinary force, shaping the human experience and perception of the landscape. Diachronic changes in settlement and physical and visual connections with and between the fortresses reveals the impacts of the fortress apparatus on Cypriot society, producing new relations of power and domination that would continue to characterize the Late Bronze Age long after the fortresses go out of use.

BIOGRAPHICAL SKETCH

Eilis Monahan received her A.B. in Classical and Near Eastern Art and Archaeology from Bryn Mawr College in 2001. She received an M.A. in Archaeology from Cornell University in 2010, and was an Exchange Fellow at the Ruprecht-Karls Universität, Heidelberg. She began her doctoral studies in the Department of Near Eastern Studies at Cornell University in 2011, and was the recipient of a Fulbright Student Research Fellowship to Cyprus and a National Science Foundation Doctoral Dissertation Improvement Grant. She has participated in fieldwork in Connecticut, Colorado, Utah, Hungary, Greece, Jordan, Turkey, and Cyprus. While at Cornell she served as the Assistant Director of the Cornell Institute of Archaeology and Material Studies (2017-2018).

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I did not intend to study the Bronze Age fortresses of Cyprus when I began my PhD -- in fact, I barely knew of their existence. For correcting that egregious lapse, I must thank Matthew Spigelman, who has also been an amazing collaborator and source of encouragement throughout this adventure. The regional survey would never have been completed without the staunch and cheerful efforts of Mari Yamasaki and Sandra Rosendahl. They dropped their lives to come toil under the Cypriot sun with me. Chris Karpis also joined us for several weeks, putting me in the enviable situation of supervising three archaeologists at least as qualified as I was. Sandra also saved my GIS.

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LIST OF ABBREVIATIONS

Organizations and Publications

ASESP = Agios Sozomenos Excavation and Survey Project

CAARI = Cyprus American Archaeological Institute

INSTAP = Institute for Aegean Prehistory

RDAC = Report of the Department of Antiquities, Cyprus

SCE = Swedish Cyprus Expedition

Chronological Terminology

EC = Early Cypriot Bronze Age

MC = Middle Cypriot Bronze Age

LC = Late Cypriot Bronze Age

PreBA = Prehistoric Bronze Age

ProBA= Protohistoric Bronze Age

Bronze Age Site Lists

AR – Gazetteer of sites from Andrea Rowe (1995) thesis

CS – Sites recorded by Cyprus Survey

GG – Catalogue of sites from Giorgos Georgiou (2007) Dissertation

HWC – Catalogue from Hector W. Catling 's (1962) Patterns of Settlement in Bronze Age Cyprus

Ceramic Wares

RP – Red Polished (I-IV)

WP – White Painted (II-VI)

BS – Black Slip

RS – Red Slip

PW – Plain White

WM – Wheelmade

HM –Handmade

WS – White Slip (I and II)

BR – (I and II)

RonB – Red on Black

RonR – Red on Red

Bichrome – Syrian/Palestinian/Cypriot Bichrome

LH – Late Helladic (Mycenaean) decorated

Other Terms

HTW = Hook-Tang Weapon

GIS = Geographic Information System

DEM = Digital Elevation Model

Chapter 1:

INTRODUCTION

Around the time that the fieldwork for this project was initiated, *The Guardian* published two articles that considered the proliferation of so-called defensive or 'disciplinary' architecture in London and other modern cities, where features such as spikes in sidewalks, uncomfortable benches, CCTV cameras, and metal barriers are "employed to deter behavior deemed unacceptable and encourage 'proper' conduct" (Omidi 2014; Andreou 2015). Ostensibly intended to protect the public from criminal behavior, these modifications to the environment also define who is a member of the public, and who is not. Says Ocean Howell, professor of architectural history at the University of Oregon, referring to the effects of defensive urban architecture on disenfranchised members of society: "Other people may not see it, but you will. The message is clear: you are not a member of the public, at least not of the public that is welcome here" (Andreou 2015). This statement holds true for all defensive architecture, the construction of which is a political act. Defensive features create and reinforce social difference and inequalities, intentionally or not, by erecting physical and psychological boundaries that define who may use a space and how (Markus 1993; Certeau 1984). The constant possibility of observation, the threat of violence, and the establishment of material barriers shape the way bodies move, creating disciplinary landscapes, by which I mean landscapes that coerce and control, affecting all who inhabit a space (Foucault 1977).

Fortresses are the quintessential form of defensive architecture, but they are also a kind of disciplinary architecture, dividing, organizing, and surveilling space, landscape, and human practice. Fortified sites first appear on Cyprus at the end of the Middle Bronze Age, coincident with a significant, but poorly understood shift towards greater social and political complexity during a period of roughly 200 years. This dramatic transformation, from a largely egalitarian village society, isolated from the developments of the surrounding Eastern Mediterranean, to an increasingly stratified and urban-focused society, fully engaged in diplomatic relations and trade with the surrounding region during the Late Bronze Age, manifested in the landscape in changes in settlement pattern and the appearance of monumental fortresses across northern and central Cyprus. Thus, these fortresses have the potential to speak to three research questions. First, what forces or mechanisms transformed Cypriot society from the simple agrarian communities of the Early and Middle Bronze Age to the socioeconomically complex urbanized society of the later Late Bronze Age? What role does warfare and the introduction of defensive architecture to the landscape play in the restructuring of social organization? And third, how can we theorize the interaction of materials, landscape, and people in these processes of sociopolitical production? This dissertation addresses these questions through an examination of the published material on Cypriot Bronze Age fortresses, and a detailed case study on the Agios Sozomenos region in central Cyprus, which was the subject of new, and ongoing, fieldwork.

The interpretation of fortresses, or perhaps more accurately monumental architecture with marked defensive features, is complicated and frequently debated, because these structures are actually profoundly ambivalent things. Because they are frequently built in response to the threat of physical violence (Solometo 2006:30), they may be understood to be symptomatic of or epiphenomenal to social change, but they can also be active political players, instrumental in the establishment of, or resistance to, political regimes (Allen 2006; Arkush 2011). Fortresses may be conservative forces in a society, working to maintain the status quo by enforcing the prerogative of the established ruling classes (e.g. the Bastille in pre-Revolutionary France, which was both instrument and symbol of royal oppression, and thus drew the ire of the populace to become one of the Revolution's most famous targets), or they can be agents of societal change (e.g. Fort Washington and the fortification of Dorchester Heights, built by the Continental Army during the Siege of Boston). Fortresses serve vital defensive purposes during episodes of conflict, and they serve multiple functions in the realms of economy, politics, or ritual during times of peace. Their architecture was monumental in nature, invoking power and even fear, but in daily practice their uses could be quite mundane or prosaic, as defenses for simple villages, enclosures for livestock, and storage facilities for staple goods. And while fortresses are real material objects with functions in the world, fortifications are also symbols of strength and solidarity (Oswald, Dyer, and Barber 2001), powerful ideas that shape human action and thought. Perhaps most importantly, fortresses are human-made objects, built things that enclose and control space, but they are also components of a wider landscape, their influence extending far beyond the confines of their walls. It is in these seeming contradictions – passive/active, conservative/progressive, violent/peaceful, thing/idea, monumental/mundane, utilitarian/symbolic, object/landscape – that the fortress's exceptional potential for political force lies.

How is it, and what does it mean, that fortresses somehow encompass all these things at once? To answer these questions, it is necessary to consider not just what fortresses are, but what they do, and how they do it. This is best achieved through the adoption of a theoretical approach that situates specific fortresses and programs of fortification within their unique cultural and historical context, yet is also grounded in modern theories of materiality and landscape that demonstrate how the stuff of the material world is provocative and efficacious in social life.

Archaeological Approaches to Fortresses

Fortifications, fortresses, enclosures – scholars have used a number of different terms to refer to large prehistoric walled structures, with the nomenclature chosen reflecting that researcher's assumptions or discomforts concerning the interpretation of the structures. Debate over these structures has been extensive, especially among scholars of the British and European Neolithic and Bronze Age. Scholars of Cypriot prehistory have similarly disagreed over the identification and function of the monumental structures that were built at the end of the Middle Bronze Age, at a critical juncture in the development of complex polities on the island. Rather than increasing interest in these structures, the debate over their function appears to have resulted in the diminishing of the structures' significance in models of the Cypriot past. Instead of positioning them in multifaceted landscapes of power and political negotiation, their contested nature and functionalist debates have reduced their role to the point where for the past two decades they have barely appeared in discussions of the developments that occurred in Cypriot Bronze Age society at this juncture.

Archaeological study of fortresses has unsurprisingly been largely concerned with the role of fortresses in strategies related to violence and warfare (Bamforth 1994; Keeley 1996; Keeley, Fontana, and Quick 2007). At the regional scale, this dominant functionalist-rationalist perspective has been concerned with the establishment of territory (Armit 2007; Lock 2011; Primas 2002; Vankilde 2013), largely in agreement with the model put forward by Keeley (1996) that fortresses are expected to appear either in hostile frontiers or near central places of political importance to the group constructing them. In Cyprus, this approach is exemplified by the studies of Edgar Peltenburg (1996) and Claude Baurain (1984), who argued respectively that the Bronze Age fortresses were built to defend the copper trade routes or that they were built in defense against foreign invasion.

Towards the end of the 20th century, however, the role of warfare in prehistoric societies became the source of some controversy (Haas and Creamer

1993; Keeley 1996; LeBlanc 1999; Webster 1993; 2000; Wilcox and Haas 1994), resulting in a simultaneous reinterpretation of fortifications and fortified landscapes. Warfare was rejected as both necessary and sufficient explanation for the construction of many structures classified as fortresses due to what were argued to be insufficient defensive features (Keeley, Fontana, and Quick 2007; Arkush and Stanish 2005). Archaeologists working in a more processual vein, such as Barry Cunliffe (1991) and Henry Gent (1983), instead proposed economic explanations for the construction of prehistoric fortifications and enclosures, such as population growth or environmental stress. These societal pressures drove the development of new strategies of centralized storage, production, distribution and trade in which fortresses functioned as hubs.

In Cyprus, this "pacification of the past" (Keeley 1996) appears to have had a similar impact on the interpretation of Bronze Age fortresses. For most of the 20th century, the monumental enclosures and related structures that appear at the end of the Middle Bronze Age and the early Late Bronze Age were considered to be fortresses. The 1974 Turkish invasion of Cyprus resulted in the ongoing occupation of the northern third of the island, which until recently prevented further archaeological research on the 22 Middle and Late Bronze Age sites that have been identified as fortresses. This has undoubtedly contributed to the loss of significance granted to these sites by scholars, and the interpretation of their role in conflict has steadily diminished. The violent destructions and defensive function of some of the sites including Enkomi (Crewe 2007) and Phlamoudi Vounari (Horowitz 2007) have been questioned, and replaced with new interpretations that focused on their roles in production and redistribution within the economic sphere. while the large fortresses in the Ayios Sozomenos region of the central Mesaoria plain were recast as “livestock enclosures” (Rowe 1995; Devillers, Gaber, and Lecuyer 2004) In other regions of the world, recent theorizations of prehistoric fortifications have argued that their role in society was more symbolic, rather than focusing on their utilitarian function in the realms of warfare or economy. In other words, rather than enforcing solidarity, strength and social boundaries, fortified structures communicate these sentiments through their form and construction (e.g Britain: Hamilton and Manley 2001; the Andes: Hastorf 1993; Parsons, Hastings, and Matos M. 2000; and Neolithic Europe: Oswald, Dyer, and Barber 2001; Whittle 1988). Bruce Trigger and Chris Tilley’s work on the immaterial force of monumental architecture is particularly notable. Trigger (1990) argues that material and energy investment in monumental architecture makes power visible and helps to consolidate new social formations, while Tilley (1994:27) explores the process by which this occurs, arguing that the innovative reconfiguration of space inside British Neolithic enclosures, whose defensive functionality is debated, provided a means of reproducing or expanding social power by creating new settings for its articulation.

Many of these studies, however, suffered from an unfortunate “all-or-nothing” or “either/or” approach to the interpretation of what should be very complex phenomena. Recognizing the limitation of such approaches, scholars including Elizabeth Arkush and Charles Stanish (2005), Barry Cunliffe (2006), and

Timothy Darvill and Julian Thomas (2001) more recently espouse a more theoretically eclectic and holistic approach to the interpretation of fortifications. These scholars, from whom the present work takes much inspiration, productively look to explain temporal and spatial variability by embracing cultural context and combining investigations into economic and social practices, symbolic communication, and warfare, rather than seeking universalizing explanations. Some of these more recent studies explicitly seek to investigate how fortresses transform landscapes (Lindsay 2011; Darvill and Thomas 2001; Parkinson and Duffy 2007; Allen and Arkush 2006). Landscapes, in turn, are understood as arenas in which social relations are negotiated and mediated, and are the media through which authority is represented and social inequality is experienced and apprehended (Anderson 2013; Blanton 1998; Grant 2001; Scott 1998). Additionally, the ability to create and transform landscapes can be used by political regimes to forward their political agendas (Smith 2003). The contextualized study of fortresses and their efficacy in the landscape may thus help reveal the stakes of social conflict: what do they enclose, who do they exclude, what do they survey? Answering these questions, however, brings violence and warfare back to the fore of consideration, as the practice of warfare is an importance arena of social negotiation and frequently central to the nature and form of fortifications.

Warfare has long been theorized to be more or less instrumental, but certainly a frequent corollary, to the emergence of increased complexity within a society (Carneiro 1970; Earle 1997; Ferguson 1984a; Haas 2001). However, the nature of the relationship between periods of violent conflict and change in social organization is neither universal nor well-understood. Certainly, fortresses and a state of violence are not mutually constitutive; fortified structures may be built in response to security concerns, but not all warfare results in fortress construction. At the same time, the structures we call fortresses possess an ambiguous nature and a vibrant potential for multi-functionality, alternatively or simultaneously operating as settlements, storage, production or distribution centers, or places for social gatherings or rituals. Any analysis must thus avoid reducing them to mere tools of war. Despite being things that exist and persist in the world, their presence is not static. What fortresses do, how they are used, their physical form, and their role in society may change over time.

A Note on Chronology

There are two chronological nomenclature systems currently in use for the Cypriot Bronze Age. The first, based on the traditional tripartite divisions used in other regions of the Mediterranean and Near East, divides the Cypriot Bronze Age into the Early, Middle and Late Cypriot (EC, MC and LC) with further subdivisions indicated by Roman numerals and letters (Table 1.1). These divisions coincide only roughly with those of neighboring regions, as the Cypriot divisions are primarily defined by the ceramic typology, and the synchronization and anchoring of these chronologies remains a subject of debate, hampered by the low numbers of radiocarbon determinations from Cyprus during this period, and the almost complete lack of C14 dates for the later MC and early LC. As relationships between Cyprus and neighboring regions became somewhat better understood, problems with the Cypriot phasing, particularly as relate to the period focused on in this dissertation, became more apparent to researchers. As Hector Catling (1973:166)

Period	Cyprus	Anatolia	Crete/ Minoan	Southern Levant	Egypt
EBI	**Philia/ECI:** 2400-2200	3000-2700	**EMI:** 3100-2650	3300-3050	**Pre-Dynastic**
EBII	**ECII:** 2200-2100	2700-2500	**EMII:** 2650-2200	3050-2700	**Early Dynastic:** 3000-2686
EBIII	**ECIII:** 2000-1900	2500-2000	**EMIII:** 2200-2050	2700-2300	**Old Kingdom:** 2686-2181
MBI	**MCI:** 1900-1800	2000-1900	**MMI:** 2050-1875	EBIV/MBI: 2300-2000	**1st Int. Period:** 2181-2125
MBII	**MCII:** 1800-1750	1900-1800	**MMII:** 1875-1750	2000-1800	**Middle Kingdom:** 2125-1773
MBIII	**MCIII:** 1750-1680	1800-1700	**MMIII:** 1750-1700	1800-1600/1550	2nd Int. Period: 1773-1550
MBIV		1700-1600			
LBI	**LCIA:** 1680-1550 **LCIB:** 1550-1450	1600-1400	**LMI:** 1700-1470	1550-1400	**18th Dynasty:** 1550-1295
LBII	**LCII:** 1450-1200	1400-1200	**LMII:** 1470-1420	1400-1200	**19th Dynasty:** 1295-1186
LBIII	**LCIII:** 1200-1050	**Iron Age I:** 1200-900	**LMIII:** 1420-1075	**Iron Age I:** 1200-1000	**20th Dynasty:** 1186-1069

Table 1.1 - Comparison of Absolute Chronologies and chronological divisions between regions in the Eastern Mediterranean. All dates are BCE. (Cyprus: Manning 2013; Anatolia: Yakar 2011; Crete: Manning 2010; S. Levant: Mazar 2009; Egypt: Shaw 2000)

observed, "Were it not for the confusion that would certainly result, a case could be argued for apportioning MC I and MC II to the Early Bronze Age, and reforming the MC period from a combination of MC III and LC I."

Because the Cypriot chronological system was established initially on the basis of a ceramic sequence developed primarily from mortuary material from a limited geographic sample of the island, confusion also grew with attempts to apply it to other regions and to settlements, resulting in the proliferation of micro-periods on one hand, and inconsistent lumping into longer phases on the other. Recognizing the problems that all this lumping and splitting was creating, and seeking "to standardize and simplify the use of unwieldy terms," (Knapp 2013: 26). Bernard Knapp (2013: 26) introduced his own system of periodization (also Knapp et al. 1990; Knapp 1993) for the Cypriot Bronze Age with two main divisions: the Prehistoric Bronze Age, roughly equivalent to the Philia through the MCII, and the Protohistoric Bronze Age, the MCIII through the Late Cypriot (Table 1.2).

Revised Schema (Knapp)	Traditional	Dates (cal. BCE)
Prehistoric Bronze Age	Early/Middle Cypriot	2400-1750
PreBA 1	Philia	2400-2250
	EC I - II	2250-2000
PreBA 2	ECIII – MCI-II	2000-1750
Protohistoric Bronze Age	MCIII-LCIII	1750-1050
ProBA 1	MC III – LCI	1750-1450
ProBA 2	LCIIA-C early	1450-1300
ProBA 3	LCIIC late - LCIIIA	1300-1050

Table 1.2 - *Comparison of Cyprus Chronological Schema, and their alignment with the Absolute Chronology (from Knapp 2013; Manning 2013)*

While these broad divisions are useful, and are applied in the discussion of the evolution of violence in Chapters 2 and 3, I continue to use the EC/MC/LC periodization for sites and artifacts assigned by previous researchers. Unfortunately, for the purpose of the present research Knapp's simplified system does not quite suffice, while the traditional periodization is more fine-grained than possible when working with survey data. My analysis of the ceramics and other material culture from Politiko *Troullia* and the sites at Agios Sozomenos suggests that the distinction between the MCII and MCIII in the central Mesaoria is marked by the appearance of Plain White pithos, Red-on-Black ware, and the proliferation of White Painted and Black Slip wares, while the MCIII to LC transition is marked by the appearance of small Plain White forms and White Slip and Base Ring ware and the rapid disappearance of Red Polished wares from the corpus. Without better stratagraphic sequences on which to base the dating, the survey results for Agios Sozomenos define three broad occupational phases: the ECIII-MCII (equivalent to PreBA2, ca. 2000-1750 BCE), the MCIII/LCIA (ProBA1, ca. 1750-1550 BCE), and LCIB and later (ProBA2, starting ca. 1550 BCE). This tripartite division, simplified as MC, MCIII/LCI, and LC, is used throughout the dissertation.

Outline of the Present Work

This dissertation adopts a holistic and diachronic approach to the three questions posed above, exploring how fortresses emerge from violence and, through the materialization and elaboration of defensive strategies, come to produce a disciplinary landscape in which a new modality of power operates. Specifically, I argue that monumental fortress architecture in Bronze Age Cyprus introduced, and then elaborated upon, the operation of disciplinary techniques of power in the landscape. These techniques fundamentally altered how people experienced and perceived the landscape, and in turn the interactions of materials and bodies in the spaces that the landscape assembled. Landscape, materials, and discourse structure human behavior and therefore society. The disciplinary landscape produced by the fortresses was thus an innovation with the potential to not just reproduce existing power relations but substantively contribute to the emergence of a new political order.

In Chapter 2, I present the theoretical framework that will inform my study of the Cypriot fortresses. I argue that fortresses can be understood as Foulcauldian apparatuses whose operation hinges on the profound efficacy of the material world, including landscapes and objects. The fortress apparatus is an assemblage of components that collectively produce defensive and monumental effects. The fortress apparatus gives rise to the disciplinary landscape, a political landscape through which disciplinary techniques generate power and knowledge and power, thereby creating subjects and territories.

Chapters 3 and 4 investigate the development of Cypriot society and the evidence for violent conflict during the Early Bronze Age and the earlier parts of the Middle Bronze Age. This contextualization of the fortresses is vital to understanding the reasons for their construction, their components, and the forms they take, all of which contribute to the capabilities of the resulting structures. This also situates my argument that the internecine violence that prevails during the period preceding the construction of the Cypriot fortresses, is supplanted, at least in part, by the disciplinary landscape that the fortresses generate.

I present the Cypriot fortresses and the fieldwork I conducted in Chapter 5. The main case study is a cluster of four fortresses in the Agios Sozomenos region of the central Mesaoria plain of Cyprus, where I collaborated with the Cyprus Department of Antiquities in excavation and completion of a regional survey. This section includes descriptions of three other Cypriot Bronze Age fortresses, one on the east coast, and two on the Karpas Peninsula in the northeast, that serve as comparanda.

As I view the fortress apparatus as a hybrid, an assemblage of both building and landscape, the analysis is presented as two parts, divided (imperfectly) by the scale at which the efficacies of the fortress are generated – the components of the structure itself, and then the structure as it operates within the landscape. In Chapter 6, I focus on the architectonic features of the fortresses, and on how the structure creates and controls space, and with it the bodies and things in that space. I consider the labor and material investment in construction; the elaboration, division, and monumentalization of space; the control of movement and visibility; and the evidence for human activity inside the structures. Chapter 7 then investigates the operation of the fortress apparatus in the landscape, particularly the generation of the disciplinary landscape through surveillance and territorialization. I consider the relationship between fortresses and natural landscape features, including topographical prominence and the location of natural resources, including water, copper, and arable land. This chapter also investigates diachronic changes in settlement patterns and their relation to physical and visual connection with and between the fortresses, exploring how disciplinary techniques shaped social relations.

Chapter 2:

ASSEMBLING THE DISCIPLINARY LANDSCAPE

Introduction

The disciplinary apparatus is the conceptual foundation of the present work, providing a lens – or as Michel Foucault called it, "an analytic of power" – through which the operation of the fortress can be understood. Illuminating though Foucault's conceptualization is, it was developed to analyze the operation of power within and among the institutions of the modern nation-state. Largely immaterial, heavily discursive, and spatially inward-facing in its formulation, on its own Foucault's apparatus is insufficient to the task at hand. I propose that fortresses are a special kind of apparatus, one that generates and exercises multiple modalities of power extensively through the landscapes of which they are both component and producer. Two of the modes of power are already frequently discussed in studies of prehistoric fortresses, if not using the same terminology. These are the sovereign and episodic modes of power associated with the coercion of *defense* and the symbolic discourse and persuasion of *monumentality*. I argue, however, that to fully comprehend the political efficacy of the prehistoric fortress requires recognition of a third modality of power – namely, *discipline* – and the resulting production of a *disciplinary landscape*. This landscape assembles space to form the medium through which the disciplinary and other modes of power work on human bodies to produce emergent political subjects.

In this chapter, I first introduce the concepts of discipline, the apparatus, and the techniques by which they generate political subjectivity. In the following sections, I endeavor to expand on the concept of the disciplinary apparatus, offering my contributions originating in theories of materiality and landscape that, when integrated with the Foulcauldian apparatus, illuminate the political efficacy of the fortress. I show how these theories address each other's deficiencies: theories of materiality and landscape enhance the disciplinary apparatus as an analytic of power by foregrounding the efficacy of materials, which are largely missing from Foucault's formulation, while the concepts of the apparatus and the tactics of discipline provide a framework for apprehending the frequently downplayed potency of materials and landscape in political production (but see Smith 2015; Khatchadourian 2016; discussed below, p. 28). Finally, I introduce a tripartite model of Defense, Monumentality, and Discipline for investigating the multiple modalities of productive power at work in the fortress and the disciplinary landscape.

Discipline and the Political Subject

> There is no need for arms, physical violence, material constraints. Just a gaze. An inspecting gaze, a gaze which each individual under its weight will end by interiorising to the point that he is his own overseer, each individual thus exercising this surveillance over, and against, himself. A superb formula: power exercised continuously and for what turns out to be a minimal cost. (Foucault 1980:155)

Discipline, as first defined by Foucault in *Discipline and Punish*, is a modality for the exercise of power that "implies an uninterrupted, constant coercion, supervising the processes of the activity rather than its result and it is exercised according to a codification that partitions as closely as possible time, space, movement" (Foucault 1977:137). In other words, discipline was an innovative form of non-violent control over the physical actions of humans, that relied on spatial, temporal, and visual technologies. These technologies of discipline, also referred to as techniques or tactics, produce the quality of "docility" in the human objects they work on. Docility is the condition of a body that is both analyzable and manipulable, allowing the body to be "subjected, used, transformed, and improved." Effectively, discipline creates a particular kind of political subjectivity. Constant knowledge of where a body is in space and what it is doing enables physical control and supervision by others, but more importantly, it encourages self-regulation: The object of coercion thus is transformed into a subject.

Foucault did not see discipline as a fully-realized policy, researched and intentionally implemented by governments and institutions, prior to the 18th century. Although his research was concerned with the perfection and wide-spread application of this modality of power at the dawn of the modern era, he acknowledged that the various tactics of discipline had been in use in "monasteries, armies, workshops" long before their use in the disciplinary institutions of modern schools, hospitals, prisons, and factories. Gilles Deleuze (1988:26) explains that discipline, "cannot be identified with any one institution or apparatus precisely because it is a type of power, a technology, that traverses every kind of apparatus or institution, linking them, prolonging them, and making them converge and function in a new way." Restricting the identification of discipline to its fully-fledged modern exercise, deceptively obscures the operation of power in the past and limits our ability to apprehend its effects. Although the operation of other modalities of power, specifically domination and coercion through physical violence and symbolic discourse, are frequently identified in prehistory, the disciplinary mode of power has yet to be explored, providing an opportunity to further investigation into the development of political relations and formations.

The disciplinary mode of power is generated by the use of particular tactics or technologies, which Foucault called techniques. The operation of discipline may be construed from the identification of the tactics or technologies. Foucault classifies these methods of objectification and subjectification under four headings – *the art of distribution*, *the control of activity*, *the organization of geneses*, and *the composition of forces* (1977:141–169). The organization of geneses and the control of activity encompass techniques largely concerned with the temporal control and fine control of bodily gestures of the individual or groups, through methods such as time-tables and training regimens. Modern examples include the regimentation of military schools and the efficiency of the industrial production line, but these techniques are by their nature difficult to identify in prehistory. There are hints of these techniques at work in the appearance of specialized, detached workshops, which imply the emergence of "work" as a concept distinct from home and leisure (Bombardieri

2016), but this remains conjectural. The techniques classified as the art of distributions are those most directly associated with the material expression and force of discipline and will be discussed in detail below. Last is the composition of forces (e.g. a military "force" or a labor "force"), by which discipline combines its various techniques of control to "obtain an efficient machine" (Foucault 1977:164). This so-called machine is made up of bodies placed, articulated, and organized spatially and temporally, in order to maximize the utility and productivity of the force, above which will be a precise system of command.

The art of distributions are the techniques by which the disciplinary apparatus allocates individuals in space. These techniques include *enclosure* and *partitioning* of space and people, the creation of *functional sites* by coding space for specific uses, and the establishment of *hierarchical ranking*, ostensibly for the purpose of improved organization and analysis, but in the process creating and reproducing unequal relations through which coercion may operate. Enclosure establishes a space different from other spaces, which is subsequently utilized for the concentration and control of human bodies and activity. Partitioning is the division of space into "as many sections as there are bodies or elements to be distributed", thereby improving observation and measurement of bodies and space, and exerting control over communication and movement. Functional sites are an elaboration on the partitioning of space, by which space that previously might have been available for different uses becomes coded for particular use, again furthering the enabling of supervision, control of communication, and also improving the "usefulness" or productivity of space. Finally, hierarchical ranking, or the practice of establishing a classification system and assigning places within it, simultaneously creates individuals and subsumes them to the collective, thus increasing intelligibility and supporting regulation, while also establishing or reinforcing (perceived) qualitative differences in which social inequality is founded. The techniques of the composition of forces and the art of distributions are the reliant on materials in their operation and are therefore the most archaeologically accessible, making them the primary focus of the present study.

All of these spatial and temporal techniques worked in conjunction with the most important disciplinary technique, *surveillance,* or what Foucault termed *hierarchical observation.* Foucault explains, "The exercise of discipline presupposes a mechanism that coerces by means of observation; an apparatus in which the techniques that make it possible to see induce effects of power and in which, conversely, the means of coercion make those on whom they are applied clearly visible" (Foucault 1977:170–171). The implementation of the technique of surveillance was perfected in the technology of panopticism, which also aids in explaining how surveillance works. Jeremy Bentham's *Panopticon* (1791), from which the term originates, was an idealized architectural form of a prison with a central tower from which all prisoners could be observed at all times while the observer remained invisible. The panopticon, or an assemblage that functions like one, is therefore a type of discipline-mechanism or apparatus. Enclosing and segmenting space though the *art of distributions* or defining groups through the *composition of forces* enables panopticism, but surveillance as a technique of control and knowledge collection is not wholly dependent on these other techniques for its operation. The source of the power that originates in the panopticon is the "state of conscious and permanent visibility that assures the automatic functioning of power." In other words, surveillance works when it is both visible and unverifiable, as the observed can always see the apparatus that controls them and cannot escape its view, but they are unsure whether there is a human operator. The apparatus itself becomes the observer, as a "machine for creating and sustaining a power relation independent of the person who exercises it" (Foucault 1977:201).

The surveilled thus become their own surveillance – unable to verify whether they are being observed, they will monitor their actions "in case" someone is monitoring them, thus producing the same effect as though there were always an external observer, and consequentially removing the need for one. Thus, surveillance is in many ways the ultimate form of disciplinary power, as the technique of surveillance turns the disciplined into the machinery of their own discipline. Other modes for the exercise of power, such as violence or symbolic discourse, have groups or classes of people as their *objects*. Disciplinary techniques transform seemingly-passive *individuals* into objectified *subjects* through domination by processes of exclusion, division, and categorization. Surveillance, in contrast, produces "subjectification," that is, "the way a human being turns him[- or her]self into a subject" (Foucault 1982:778). Surveillance, by encouraging self-monitoring and regulation, drives the subject to discipline her/his own behavior and thus makes her/him not just complicit but an active participant in their own objectification. Such an individual is no longer an abstracted object of relatively successful or unsuccessful attempts at domination, but an individual subject actively participating in the reciprocal production of political relations.

Materializing Foucault's Apparatus

> What I'm trying to pick out with this term is, firstly, a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions–in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that can be established between these elements. (Foucault 1980:194)

The apparatus is key to understanding the operation of disciplinary power, as it is the "machine" that generates and sustains power relations. However, it is not clear in Foucault's definition above just what it is about the apparatus that provides it with its particular force and obstinacy in society. I argue that Foucault's definition of the apparatus is limited by his immaterial conceptualization of its components. He lists only architectural forms, and even then spends little effort considering what qualities specifically make the architectural components vital to the functioning of the apparatus, and although he does not explicitly exclude other materials, they play little part in his theorization. Foucault conceived of the apparatus as an "analytic of power," meaning a method for understanding the relations between power and knowledge and I agree with Karan Barad's critique that,

> there are crucial features of power-knowledge practices that Foucault does not articulate, including the precise nature of the relationship between discursive practices and material phenomena; a dynamic and agential conception of materiality that takes account of the materialization of all bodies (nonhuman as well as human and that makes possible a genealogy of the practices through which these distinctions are made. (Barad 2007:200).

Materials and their activity cannot be excluded from the discussion of the apparatus and actually must be foregrounded, because there are qualities of materials and landscapes that are critical to the operation of the apparatus.

The "material turn" in the humanities and social sciences has called attention to the role that materials, things, or objects play in the social world, with various theories of materiality and landscapes granting entrée to a world of efficacious things and their relationships. In some theorizations, the material world of objects and buildings is implicated as either the "material conditions" (Barrett 1987) or the "artefactual domains" (Miller 1998) of social practice. However, materials are capable of greatly effecting and participating in human action, and are therefore more than just props or backdrops. Bruno Latour (2005a:71–72) productively argued that "anything that does modify a state of affairs by making a difference is an actor," and therefore things must be viewed as potential social actors as well. He defends their identification as active participants in social life by recognizing their ability to "determine, authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, etc." Thus materials are not just the conditions of action, but participants in both the action and in the structure that shapes and directs action.

Particularly significant for appreciating the vital role that the material world plays in political relations, Latour also observes that asymmetries in human social relations are not naturally stable, necessitating that relationships be constantly negotiated and reinforced or they will lose their strength over time. Intermittent face-to-face interactions alone are insufficient to explain the stark and long-lasting inequalities in human relationships and, writ-large, society. What remains to explain the stability of social relations and the power differentials within them is the continuous reinforcement provided by the persistent, physical nature of the material world. Thus, the disciplinary apparatus would not function without the architectural structure of the institution that provides continuous separation and categorization of bodies and access to resources. The physical characteristics of the material components of the apparatus contribute to their force and grant longevity to their efficacy, or to borrow Foucault's (1977:192) phrasing, they contribute to the "permanent and continuous field" of power in which human bodies distributed .

How the relationships and interactions among components are conceptualized is another way in which materiality theory and the Foucauldian apparatus may be productively integrated. The "heterogenous ensemble" of the apparatus is similar in formulation to the social and material assemblage as proposed by Gilles Deleuze and Félix Guattari (1987:406) and advanced by Manuel DeLanda

(2006). These scholars asserted that social bodies or groups are made of a heterogenous assemblage of parts, and that although these components possess their own autonomous existences outside the assemblage, the resulting assemblage as a whole possesses its own "irreducible properties, properties that emerge from the interactions between parts" (DeLanda 2006:10). This type of emergent property, a "capacity to make something new appear or occur" is what Jane Bennett (2010:31) referred to as "efficacy" in an assemblage, and it is these efficacies, the ability of fortresses to make something new appear or occur, with which this thesis is concerned.

How the roles and activity of humans and materials in assemblages, and the apparatus, are conceptualized and defined vary and can be the source of confusion. First, it is necessary to understand that the human actor consists of an embodied mind, but the human body itself is material, having a physical existence in the world and possessing characteristics that effect social and material interactions. Bennett (2010:36), in her effort to break down the human-thing ontological divide, intentionally conflates agency and efficacy when developing her thesis of distributed agency, where "the locus of political responsibility is a human-non-human assemblage." Although her identification of political force as emerging from human-non-human interactions is compelling, for clarity I consider *efficacy* as the ability of things, or assemblages, to cause an effect, and thus conceptually distinct but parallel to *agency*, which is the capacity of a person, or people, to act. Humans (and animals) have material bodies, and may thus be components of an efficacious assemblage or apparatus, as well as possessing their own agency. Foucault spent a great deal of time writing about the tactics and technologies of power, and in the process discusses a myriad of things, including walls, pencils, rods, books, and clothing, yet he fails to go so far as to consider how the operation of those technologies are dependent on the things themselves. Material efficacy is missing from his formulation.

A third important concept here is the *affordance*, which comes from the environmental psychology theory of psychologist James J. Gibson (1966; 1979). To Gibson, an affordance was what the environment provides an animal, or more specifically the options and potential for action. The term was adopted by archaeologist Ian Hodder (2012:48–50) who specifically used it in reference to objects and human-object "entanglements," and his application more closely resembles my own. The qualities of materials afford opportunities for certain interactions while hampering or preventing others, or in other words. Additionally, interactions between materials generate much of the efficacy of the assemblage by producing new effects and affordances that the individual components alone would not. Affordances, like efficacies, help to explain the role of materials in the generation of power, but, as will be discussed in more detail below, affordances also help to explain how the operation of the apparatus changes over time.

This is not to say that the material assemblage and the apparatus should be understood to be identical. An assemblage is a contemporaneous grouping of heterogenous elements. An assemblage can be the result of human activity or it can emerge out of happenstance. The definition of the assemblage and its efficacy emerge from the relations between its parts, so when the components change, a new assemblage comes into existence. The kinds of components that can make up an assemblage depend on the assemblage theory being used, so I specify the material assemblage when I mean to exclude immaterial components, and I include the human body as material, if not the workings of the human mind. The apparatus, although similar in some ways, has notable differences. First, it is diachronic. The apparatus is assembled gradually over time by humans in response to "local conditions and particular needs" (Foucault 1980:159). Changes to the components of the apparatus do not change its definition, but will change its capabilities, and so the apparatus and its effects may change over time. Second, as already discussed, an apparatus is made of both material and immaterial components. At any given time, an apparatus may contain one or many material assemblages, but the apparatus itself is the system of relations between both material and immaterial, discursive components, and the relations may include communication, discourse and meaning. Every configuration of components is a unique assemblage, while the apparatus is fluid and evolving. The assemblage is ad hoc and tactical, while the apparatus is strategic, combining the tactics produced by assemblages within it to generate its force.

Adam T. Smith (2015:48) argues that the assemblage, because it is synchronic, does not have the capacity to act in the world (cf. Deleuze and Guattari 1987; DeLanda 2006; Bennett 2010; Hodder 2012), and so another concept is required to express not just the articulation of elements but their operation, which he terms the machine. Notably, in *The Political Machine* Smith's machines are very much like apparatuses, and he occasionally uses the terms interchangeably (e.g. Smith 2015:184), but he never engages with Foucault's conceptualization. Smith includes both physical relations ("sensibility") and discourse in the form of signification and affect ("sense" and "sentiment") in the efficacious relations between materials and humans within his machine (Smith 2015:57), and so in this sense too, the machine seems like the apparatus. In fact, Foucault also repeatedly refers to the apparatus as a machine, or machine-like, but while the apparatus is a strategic response to a specific, historical need, Smith's civilization, war, and political machines are more abstract in their impetus and formation process. The political arena of concern to Smith appears to be the historical production of large-scale political formations, and as a result his machines are massive, stretching across societies, centuries and hundreds of kilometers. This contrasts with the apparatus, whose formulation as a system of power relations, established within a complex assemblage, and serving specific strategic interests, allow it to cover many social, temporal, and spatial scales, ranging from that of a building to an army to all the systems of the state (Foucault 1980:158). Thus the apparatus appears to be more confined vis-à-vis the principles of its emergence and reproduction, but the concept's utility covers a broader range of formations. Smith's machine is a valuable analytic for understanding a particular kind of political efficacy in materials, but it is less useful for understanding how and why power relations form and develop within more defined spatial and temporal spheres.

Like Smith, other scholars have developed productive theories that contribute to our critical appreciation for the political efficacy of things, but Lori Khatchdourian (2016:60) cogently observes that they "offer[s] insufficient analytic purchase on the distinctive operations of materials caught up in the undemocratic politics [of imperial formations]." Although Khatchadourian is explicitly concerned with the operations of materials in imperial and colonial political formations, her critique also holds true for small, localized political formations, which are only partially addressed by Smith (2015) as discussed above. Bennett's (2010) "political ecology" of vibrant matter and Latour's (2005b) Actor-Network-Theory-informed "res publica" are focused on the formation of a democratic public that also includes things, and particularly materials, as participants. Latour and Bennett's theories are thus largely unconcerned with, and less applicable to, the divergent tactics and strategies of different classes within early societies. Both theorists also collapse the concepts of material efficacy and human agency, distributing responsibility throughout the assemblage. In Latour's theorization this results in intention becoming lost in the (mis)translation of mediating things, while Bennett's assemblages of vibrant materials result in "less definitive outcomes." In the process, both theories deprive human intent of much of its potency for instigating action to strategic ends, while simultaneously failing to provide a particularly rigorous or compelling mechanism for how exactly things are so capable of redirecting or thwarting human agency. Hodder's (2012) theory of entanglements focuses on just this, but despite the tangled relationships of dependence and dependency that can limit or guide human action and its results, his theorization remains distinctly apolitical, largely avoiding the problematic of power relations. In contrast, Khatchadourian's *Imperial Matter* (2016) is explicitly about the role of things and the nature of imperial power, laying out a compelling model for how materials produce, transform, and even undermine power relations. However, her work is concerned with the transmission and negotiation of relationships across great spatial and social distances of empire. Her analytic thus focusses specifically on the power relations between diverse publics and the apparatus of empire, instead of the grassroots coalitions of tactics that build up local political formations.

Foucault's apparatus does just this, providing an analytic for how tactics of power combine to serve existing strategies or produce new opportunities for political action. Theories of materiality, however, help explicate how material components of the apparatus provide affordances for action, while also granting the apparatus qualities of durability and constancy. Assemblage theories similarly contribute by modeling how the interactions among components, human, material, and immaterial, can be effective and unruly, and I propose that the tactics or techniques of power that make up the apparatus are made of exactly these sorts of efficacious interactions. Thus the apparatus sheds light on the vital contributions of materials to political efficacy of the material world in the production of the tactics and technologies of power, and their use in the pursuit of strategic, often inherently political, goals. In the next section, I discuss how this nexus of agency, intent, and the mechanisms of political transformation are another place where Foucault's apparatus can meaningfully contribute to a theory of political materiality.

Agency and Intent

> One impoverishes the question of power if one poses it solely in terms of legislation and constitution, in terms solely of the state and the state apparatus… In an apparatus like an army or factory… the system of power takes a pyramidical form. Hence there is an apex. But even so, even in such a simple case, this summit doesn't form the 'source' or 'principle' from which all power derives…Does this new technology of power take its historical origin from an identifiable individual or group of individuals who decide to implement it so as to further their interests…? No. These tactics were invested and organized from the starting points of local conditions and particular needs. *They took shape in piecemeal fashion, prior to any class strategy* designed to weld them into vast coherent ensembles. (Foucault 1980:158–159; emphasis added).

Human agency is distinct from the efficacy of the human-material assemblage in that it originates in intent. Human action emerges from intent, but whether the results of those actions are those that were intended is another matter entirely. The question of intent is therefore difficult to address archaeologically, because the ancient mind, especially in prehistory, is a black box. The researcher may see what enters and exits the black box, but the inner logics of reasoning and motivation that convert stimulus to action remain unknown and can only be argued contextually, a form of causal inference. The motivation behind actions that result in social or political transformation are often attested *post hoc ergo propter hoc* to aggrandizing factions of elites or aspiring elites, who are presumed to have understood the implications and outcomes of their actions.

Instead, the extended temporal duration of some large-scale sociopolitical transformation argues against such political omniscience on the part of political instigators. A revolution may take place in a matter of days or weeks under the purposeful direction of a few individuals by building factions and manipulating the correct levers of social power, but other transformations, although they may appear rapid within the near-geological time-scale of the longue durée of prehistory, occur over multiple generations or even centuries. In such situations it is less likely that the actors had the prescience to appreciate how their actions would play out and advantage their heirs. Absent evidence for powerful, emergent elites, it is possible that the continued predilection for this explanation is due to researchers' unconscious biases, the result of their personal knowledge and experiences with the dynamics of modern power relations and the speed of modern political transformation.

Intent in long-duration political transformation is more likely to be situated in one of two places: either in iterative small actions taken to achieve short-term tactical benefits, which then compound into longer-term and larger-scale change, or in larger-scale strategic actions taken for a specific immediate purpose, which later result in unforeseen consequences in other social arenas. Materials are particularly implicated in these latter situations of political transformation, because they produce stability and the limitations and affordances for action that form the conditions within which future choices are made and from which iterative change is built. Additionally, unanticipated interactions of the components of increasingly complex assemblages are sources of unforeseen consequences, that in turn alter the field of possibilities for future action and thus redirect political outcomes. This requires careful assessment of the temporal scale and sequence of events and the social and material context in which events occurred, before social change can be attributed to the actions of a particular faction, or to any sort of strategic intent at all.

Appreciating the importance of materials to the production of power, Foucault's apparatus can then also contribute to a theorization of the relationship between materials and political intent. Although Foucault clearly understood the establishment of the apparatus to be grounded in human agency, he did not exclusively situate that agency or intent within an individual or even a political regime, and he recognized the potential for political force of the unruly apparatus once it begins to operate and reproduce itself. Specifically, Foucault identified two important features of the apparatus: First, he understood the apparatus to be a complex formation, "which has as its major function at a given historical moment that of responding to an urgent need." The apparatus is system of generalized tactics that generates power and knowledge, resulting from the "prevalent influence of a strategic objective." Thus, just as the mental hospital was an apparatus established to treat illness or the prison was built to rehabilitate prisoners, so too may the Bronze Age fortress have first been built for defense. The tactics themselves that produce and are produced by the apparatus came together "piecemeal… prior to any class strategy" (Foucault 1980:159; quoted on p. 17). The construction of such an apparatus also could originate in cooperation within an egalitarian group, rather than the commands of an elite, as a widely recognized social need like defense might serve as a rallying point for consensus formation and cooperation or coalition building (Pauketat 2000).

The second aspect of Foucault's theory that shines light on the part the apparatus plays in modifying human agency and strategy concerns how the apparatus operates after it is first assembled. Namely, with the successful production of social power through the exercise of various tactics, the apparatus reproduces itself and in successive iterations comes to exceed or even undermine the original intent that drove its design. As it continues to operate the apparatus becomes, "the site of a double process" consisting of *functional overdetermination* and *strategic elaboration*. Functional overdetermination refers to the manner in which the various effects of the apparatus, "positive or negative, intentional or *unintentional*" interact in unpredictable ways, and the elements of the apparatus adjust in response. In the terminology of materiality, the unruly interactions of things create desired efficacies that humans then attempt to reinforce, undesired efficacies that they attempt to dismantle, or new affordances are identified that they attempt to coopt. In this manner, the apparatus grows and evolves. Strategic elaboration refers to the process by which the apparatus (and the process of functional overdetermination) generates *unforeseen* effects that have "nothing to do with any kind of strategic ruse on the part of some meta- or trans-historic subject conceiving and willing it" (Foucault 1980:195). In this manner, new strategies of power may emerge.

Foucault illustrates these processes in his discussion of the prison, an apparatus intended to punish criminals and remold them as good citizens. The function of the prison made detention appear as both effective and efficient, thus encouraging its continued use and the refining of the methods of confinement, but in the process it also created a new kind of hardened criminal, which then sustained and fed the growth of the prison industry.[1] Strategic elaboration then lies in the use of these new criminals for economic gain by society, for example using criminals in commercial work gangs, or forcing criminals into prostitution, and by creating jobs for prison wardens.

This double process explains how technologies of domination and discipline can emerge within an apparatus that was assembled with an unrelated strategic intent. As a system of power relations, the operation and effects of the apparatus change as its components change over time, and so too can the strategic intent that drove its initial assemblage change, with the techniques of power repurposed to serve new strategic functions. These determinations must be made contextually, rather than assumed, but this understanding of how power may be assembled gradually and cooperatively, and how it can transform or be coopted, requires the

[1] This pattern of overdetermination also bares a similarity to Hodder (2012)'s description of material dependencies and entanglements, in which humans come to rely on things for their affordances but things rely on humans for their reproduction, and so things and humans become entangled in webs of each other's operation and reproduction.

archaeologist to question any model of political transformation whose locus of instigation is an otherwise invisible "elite." Instead we must interrogate how materials are assembled, what affordances they provide, and what power relations they produce. Mapping changes to the material components of the apparatus may allow identification of the iterative tactical shifts of overdetermination, while strategic elaboration encourages the researcher to examine how the operation of the apparatus may contribute to or even drive structural social transformations.

The Disciplinary Landscape

> A whole history remains to be written of *spaces* – which would at the same time be the history of *powers* (both these terms in the plural) – from the great strategies of geo-politics of to the little tactics of the habitat, institutional architecture from the classroom to the design of hospitals, passing via economic and political installations. (Foucault 1980:149, emphasis and parentheses original)

As Foucault considered himself a historian it is unsurprising that he approached his theorizations as histories, but it is worth noting that he explicitly links *spaces* and *powers*, tying the production of power to specific spaces. Although he never produced this proposed history of spaces, these concerns can also be clearly observed in the spatialization of the techniques of discipline, with power generated through the creation of spaces, the distribution of objects in space, and control of movement. Landscape is itself a heterogeneous assemblage composed by the interactions, or practices, of humans and materials arranged, acting, and interacting in space. Thus appreciation of the efficacy of materials and assemblages aids in understanding how landscapes are also efficacious. The formulation of the disciplinary landscape put forward in the present research is intended as a contribution toward Foucault's "history of spaces," as well as to the productive synthesis of approaches to materiality and landscape.

The fortress is an apparatus whose operation hinges on the profound efficacy of the material world, most especially landscapes. The components of the fortress apparatus collectively produce the defensive and monumental efficacy associated with the fortress. The fortress apparatus, through these efficacies and others, also gives rise to a disciplinary landscape, being a landscape that produces disciplinary techniques, and those techniques operate to generate power and knowledge. Foucault (1977:143) specifically observed that "Discipline organizes an analytical space" through these techniques, creating, categorizing, and observing space and those objects and bodies within it, and explicitly linking relations of power together with relations of knowledge (see Agamben 2009). In instances where the operation of techniques of disciplinary power can be identified in the landscape, and produced by components of the landscape, then we may say that we have a disciplinary landscape. Thus, investigating the emergence of disciplinary techniques in the landscape reveals the operation of the fortress apparatus as a source of multiple modes of political power operating at different social scales to produce knowable and manipulable subjects.

The fortress apparatus would be unable to generate its defensive, monumental, or disciplinary efficacies without the vital components of the landscapes in which they are situated and through which they operate. Even before the material turn took hold, spatial and landscape theorists had already embraced the landscape as location, product, and participant in social relations. This relational ontology of space and landscape is summarized by Henri Lefebvre when he wrote, "(Social) space is a (social) product" (1991:26), meaning that space is assembled and understood through the relationships between things, rather than being any sort of inherent quality. In this ontology, space is already an assemblage of sorts, the product of the interactions of independent components. In this vein, Michel de Certeau (1984:102) saw the production of space as a human-mediated process in which, "Space is constantly being defined, *assembled*, by human activity and experience, most particularly the quotidian and unconscious," and Smith (2003:32) suggests that "landscapes *assemble* places to present more broadly coherent visions of the world" (emphasis added).

A potential for confusion is the possible misunderstanding that space is fully negotiable. Instead, the relationships between bodies and environment are subject to the limitations and affordances of the material world. Smith (2003:67) observes this exact problem with phenomenological approaches to landscape that "make the mistake of forgetting the materiality of space, its ability not only to mean, but also to constrain, direct, and order physical relationships." These material constraints are also the reason that not everyone has the same ability to participate in the creation and negotiation of space, because as Edward Soja (1989:101) cogently observed, "spatialization is expensive." The ability to participate in spatial negotiations is politically significant because space reflexively shapes the landscapes and spatial practices of people. Not everyone has the same capacities to participate in spatial production, especially material production of physical spaces, because of differential access to the necessary energy (i.e. labor and materials), making spatial production a source of social power. Landscape too is not fully negotiable, because of the physical qualities and material components of the natural environment, which is not a passive backdrop to human action and perception, but generates its own affordances and effects either alone or in relation with other components of the landscape, including the built environment. Thus, the landscape may be implicated in the generation of techniques of power, or even incorporated into the operation of an apparatus.

While humans assemble an apparatus in response to particular strategic interests, the landscape is assembled by all the spatial practices in which social relations are enacted. In order to describe and analyze the spatial practices through which social and political relations are enacted and by which space is "assembled" into landscape, I turn to the tri-partite division of spatial practice as proposed by Lefebvre (1991:38–46) and adopted by Smith (2003:73–75). This framework divides spatial practice into the dimensions of experience, perception, and imagination. Spatial experience encompasses material spatial practices, particularly the movement and activities of bodies in space and the construction of new spaces, which reflexively structure and in turn are structured by the materiality of the environment, built or natural. Spatial perception refers to the sensory experience and processing of space, and so encompasses symbolic communication, memory, and other sources of mental and emotional affect. The third dimension is spatial imagination, which refers to discourse concerning space. The operation of a Foucauldian apparatus undoubtedly involves such discourse. Indeed, these discourses are the primary focus of Foucault's original conceptualization of the apparatus, but in prehistory they are difficult or impossible to access. In some situations, representations of space or the landscape in the form of art, maps, or even the layout of cities could provide some access to this dimension, but such sources are in short supply for the Early and Middle Bronze Age and so will not be a focus of the current project.

Many, if not all of the techniques of power on which the operation of an apparatus rely are also spatial practices, so the operation of the apparatus also assembles a landscape – a political landscape that is both component and product of the apparatus. This disciplinary landscape is therefore similar to and takes inspiration from Smith's "political landscape." He defined the political landscape as "a spatialized set of political practices dedicated to producing and reproducing authority in relationships between subjects and regimes" (Smith 2003:148). The disciplinary landscape, however, refers specifically to the spatial practices, i.e. techniques, that generate disciplinary power and are therefore implicated in the production of subjects, and the disciplinary landscape is produced by an apparatus, rather than a regime, though it is possible that these two concepts could be aligned. The efficacies and affordances of the disciplinary landscape were also the product of the strategic intent of the apparatus, but they participate in processes of functional overdetermination and strategic elaboration, thus making up the spatial and operational field of possibilities for future political action. In this manner, the disciplinary landscape, or any apparatus-created landscape, does not exclusively support existing power relations, but through emergent, unruly effects of the apparatus, can contribute to political change.

All institutions exist within landscapes, but compared to the school, the hospital, or the temple or church, the fortress is particularly externally focused in the spatialization that it produces to achieve its ends as a component of a defensive apparatus. By the nature of the particular "urgent need," i.e. defense, to which a fortress responds, the efficacies it generates are turned as much outwards as in. The fortress apparatus protects the space, materials, and bodies inside their walls and in the surrounding landscape through the efficacy produced by techniques that utilize the affordances of the landscape. The degree and manner to which these techniques generate a disciplinary landscape will help us to answer the questions posed by this dissertation: what do fortresses so, and how do they do it?

Tactics of Power in Fortresses and the Landscape

> The longer I continue, the more it seems to me that the formation of discourses and the genealogy of knowledge need to be analysed… in terms of tactics and strategies of power. Tactics and strategies deployed through implantations, distributions, demarcations, control of territories and organizations of domains which could well make up a sort of geopolitics where my preoccupations could link up with your methods. One theme I would like to study in the next few years is that of the army as a matrix of organization and knowledge; *one would need to study*

> *the history of the fortress*, the ‘campaign’, the ‘movement’, the colony, the territory. Geography must indeed lie at the heart of my concerns. (Foucault 1980:77; emphasis added)

The disciplinary landscape that emerges from the operation of the fortress apparatus generates power that can establish or reproduce relations of authority or inequality through various tactics. But how do we identify these tactics in the archaeological record? The continuous operation of the apparatus, some aspects of which are independent of human agency and many grounded in material and spatial practices, as well as the apparatus’ reliance on architectural forms and the natural environment as major components (Foucault 1980:148–149) means that portions of the apparatus remain, from which affordances and efficacies can be inferred or reconstructed through processes of analogy with contemporary practices. Additionally, the autonomous and sometimes unruly nature of materials and their capacities means that once the technology of discipline and other modes of power have been generated through the interaction of components in the landscape, the field of possible future actions is altered. A diachronic study of changes in the landscape provides an opportunity to observe or reconstruct the material and spatial practices associated with the apparatus changing over time. This may indicate the degree to which fortresses are implicated in the production of disciplinary space through techniques of coercion, control, and surveillance, and can reveal shifting strategies of power operating in the landscape.

In attending to the role of fortresses in the sociopolitical developments at the end of the Middle Bronze Age on Cyprus, the operation of discipline in the landscape emerges through the production of three closely-related capacities of power within the fortress assemblage:

1) Defense[2] - tactics that protect or secure
2) Monumentality – tactics that create and communicate identity
3) Discipline – tactics that produce docility

Foucault posited that human actors initially assemble an apparatus as a strategic response to a particular urgent need, and in the case of the fortresses built on Cyprus at the end of the Middle Bronze Age, this urgent need was almost certainly *defense*. The violent context that established this strategic need will be explored in Chapters 2 and 3, while the analysis chapters will present the material and spatial tactics that Cypriot fortresses used to produce their defensive strategies. Some of the particular configurations and practices of bodies, architecture, landscape, and other materials that produce defensive efficacy, also produce the effects associated with *monumentality*. The monumental strategy is produced largely through a set of discursive technologies or practices that produce affect and meaning in the landscape, contributing to discourses of identity and political relations. *Discipline*, already discussed extensively, uses many of the same technologies, or components as the defense and monumentality, but produces docile subjects through regulation.

[2] The defensive apparatus might also be termed the security apparatus, but that term is already in common use to refer to the governmental apparatus associated with policing, surveillance, and other, often highly militarized, functions of the modern nation-state. This is not to say that the two are not genealogically related.

Chapters 6 and 7 analyze the evidence for the operation of these different capacities and modes of power. The chapters divide the analyses up crudely by the scale at which the tactics operate. Chapter 6 considers the scale of the fortress architecture and the landscape of interior and immediate surroundings, while chapter 7 looks at the scale of the landscape of the local region. Defensive techniques analyzed include enclosure, controlled access, and increased outward visibility, and oversized architecture, which provide affordances such as shielding defenders, slowing attackers, providing early warning, and intimidation. Monumentality is assembled through the experience and perception of architectural scale and elaboration or of prominence in the landscape, so tactics and practices analyzed include construction, architectural elaboration, prominence, and symbolic communication and emotional affect. The analysis of Discipline considers mainly the techniques of the art of distributions and surveillance, but other evidence for other techniques is also discussed.

This theoretical framework will be used in the analysis of Cypriot fortresses in Chapters 6 and 7, but first it is important to understand the context in which the fortresses were built. Cypriot society in the prehistoric (i.e. Early and Middle) Bronze age is characterized in most of the scholarly literature by independent and relatively egalitarian villages, reliant on hunting, terrace and plow agriculture, and pastoral herding of sheep and goats, with minimal craft specialization, and almost no communication with societies outside the island. However, by the end of the Middle Bronze Age, there is evidence for large-scale population upheaval, with villages destroyed and abandoned, and the construction of fortresses across the island. In order to understand who built the fortresses, and why, I investigate the evidence for a history of violent conflict and its effects on Cypriot society next.

Chapter 3:
Prehistoric Violence in the Cypriot Bronze Age

While the name "fortress" implies a defensive structure built in response to concerns of violence, the reassessment in recent decades of various Cypriot structures previously identified as fortresses as animal enclosures, metallurgical workshops, ritual centers, or centers for the storage and redistribution of staples, has distanced the fortresses from their potential roles in violence and war. This is not to say that fortresses cannot be, or were not, multivalent and multifunctional structures, and there are strong arguments to be made for various of the fortified structures on Cyprus acting in different capacities. However, if we are to understand what these structures did, and specifically what roles fortresses played in the society of Bronze Age Cyprus, we need to understand the social and historical context of their construction, and critically, whether the practice and process of internecine conflict was part of that context.

As has occurred in other contexts of global prehistory, the study of societal change on Bronze Age Cyprus may arguably be hampered by what Lawrence Keeley (Keeley 1996) has called the "pacification of the past." Although the archaeology of historical periods has long attended to practices of warfare and strife that animate the grand narratives of political history, in some parts of the world, prehistorians have dismissed violence as an inconsequential factor in cultural or social change among less complex societies (Solometo 2006:23–24). This may be due in part to the mistaken view that warfare was infrequent or less serious prior to the rise of complex societies (Keeley 1996:18) or that prehistoric warfare was "ritual" or "irrational" (Arkush and Allen 2006:2), when evidence indicates that warfare in prehistory and among less complex[1] societies was common, frequent, and often brutal.

Current research on the Bronze Age on Cyprus exemplifies this entrenched inattention to prehistoric violence, although this was not always the case. Prior to the 1990s, descriptions of the later Cypriot Bronze Age were populated by sweeping narratives of Hyksos invasions and Mycenaean colonization, amply evinced by the burials of warriors and the construction of massive fortifications (Sjöqvist 1940; Catling 1973; Merrillees 1971; Fortin 1981; Baurain 1984). After the arrival of the New Archaeology, with its suspicion of explanations reliant on external and historically contingent forces, this narrative of widespread unrest and conflict between invader and indigene fell out of favor. Cypriot archaeologists looked instead for autochthonous developments to explain social change, investigating household economics and settlement patterns, gender and craft production.

[1] Or "non-state." The difficulties inherent in the terminology and classification of societies and their organization are well-known. In order to avoid falling into the neoevolutionary tautology, in which societies progress through levels of increasing complexity from band to tribe to chiefdom and finally to State, and in which any deviation from this path is marked as failure, I refer instead to greater and lesser levels of institutionalized complexity. Complexity, as in Systems Theory, refers to the number of components in a system and their arrangement: greater differentiation or specialization in roles and levels of hierarchical ranking are measures of increased complexity. The "State," such as it is, denotes a society with high levels of socio-political hierarchy and socio-economic stratification, and centralized and institutionalized loci of political power.

As a result, while scholars working on Cyprus in recent decades have not denied the presence of violence during the Bronze Age on Cyprus, the topic has received little attention (cf. Sneddon 2014). The otherwise comprehensive synthetic and diachronic studies of Cypriot prehistory by Louise Steel (2004) and Bernard Knapp (2008; 2013) barely mention the major cultural and social discontinuity or "transitional period" at the dawn of the Cypriot Late Bronze Age or the role that violence might have played in such change. Other, more narrowly focused studies on the Cypriot Bronze Age, such as those on mortuary practices (Keswani 2004), changes in ceramic technology (Crewe 2007), and even the development of Bronze weapons (Philip 1991) downplay coercion and conflict in their interpretations. To borrow again from Keeley, "they ignore the bellicosely obvious, for the peaceably arcane" (1996:29): Weapons became materially unimportant, their function limited to the realm of symbolism, as bearers of status, authority or units of wealth. Fortresses became production centers, nodes in trade networks, or animal enclosures. Increased wealth stratification and regionalism in material culture is understood to be rooted in differential trade access. A society formerly understood by scholars to be at war, appears instead to suffer at worst from some amorphous instability.

In this chapter, I demonstrate that violence, and in later phases warfare, was an ongoing concern during the prehistoric Bronze Age on Cyprus. I argue that despite the prevalence of evidence for violence, internecine conflict has been largely neglected as a research topic on Cyprus, resulting in a serious lacuna in our understanding of social and political development during the Cypriot Bronze Age. To this end, this chapter is divided into two parts: First, I discuss the problems with understanding and identifying prehistoric violence in the archaeological record, and present some recent frameworks for investigating and interpreting a number of material correlates for warfare. In the second section, I consider the evidence for violence on Cyprus during the Prehistoric Bronze Age (ECI-MCII, ca. 2300 – 1750 BCE) as a necessary precursor for understanding the developments that are to come. The following chapter will then present the evidence for large-scale sustained conflict on Cyprus during the MCIII/LCIA (1750-1550 BCE) transitional period, which other scholars have widely acknowledged as a period of "unrest," but with the goal of better understanding the scale and other variables of the conflict. This groundwork is necessary to confront the effects of the new material assemblage of violence, including fortresses, on Cypriot society.

Problems with Prehistoric Violence

Anthropological and historical research indicates that warfare among non-state or non-centralized societies is common (Otterbein 1970; Keeley 1996; Solometo 2006; Vandkilde 2006a), although intensity and length of conflict can vary greatly, as can the forms that violent conflict take (Wileman 2009; Arkush and Allen 2006:5–6, 24; see also LeBlanc 1999). War, defined as "organized and purposeful group action, directed against another group involving the actual or potential application of lethal force" (Ferguson 1984:5), involves intent and community participation, excluding accidental or isolated occurrences of violence. Another useful definition of war is "a period of armed hostility" (Meggitt 1977:10), as it encompasses not just engagement in combat, but also periods of preparation for and recovery from repeated episodes of armed conflict. This reminds us that war is not a singular event, but a process, and often a protracted one at that.

'War' and 'warfare' imply a certain scale of conflict beyond interpersonal violence or crime, or events such as isolated raids or ambushes. However, these terms can still encompass a wide range of conflicts, from localized patterns of sporadic conflict between villages or kinship groups, through regionalized conflicts involving alliances between multiple communities and possibly requiring a level of political organization and control commonly associated with chiefdoms or complex tribal structures, all the way to territorial or imperialistic conflicts undertaken by more complex societies, these last being the most common modern definition of war (Wileman 2009:6; see also Redmond 1994). Acknowledging variability in the practice and process of war is necessary, lest narrow and conflicting definitions result in disagreement over the presence and significance of war in prehistoric societies.

Julie Solometo (2006) provides a useful rubric for exploring the variability of war in what she terms "non-centralized societies" through seven dimensions: social distance, social scale, tactics, goals, frequency, predictability, and duration, which she developed using evidence from inventories of modern, historical, and archaeological groups. Table 3.1 summarizes Solometo's seven dimensions, by splitting social

		Initiation/Duration	Damages
Social Distance	*Strong*	Prevents or limits conflict; Cyclical	Avoid deaths, esp. non-combatant; Minimize property destruction
	Weak	Few reasons to achieve/maintain peace; Continuous	High mortality; Dehumanization -> mutilation, cannibalism; Settlement & resource destruction
		Tactics	**Goals**
Social Scale	*Small*	Stealth; Ambushes, Raids	Revenge; Prestige
	Large	Defensive; Major offensives	Annihilation; Conquest
		Defense	**Anticipation**
Frequency/ Predictability	*Low*	Minimal effort/ investment	No anticipation, usually surprised/unprepared
	High	Fortification; Mobility strategies	Knowledge collection; Material preparations; Warrior culture

Table 3.1 – Summary of some dimensions of war and corresponding variability. Modified from Solometo (2006:27–34).

distance, social scale, and the frequency/predictability of combat along their major axes, and then showing how these effect some of the other dimensions of war. The resulting rubric is useful for thinking about how some dimensions of war interact with each other, and which dimensions are most likely to co-vary, but is not intended to be exclusive or deterministic.

For example, in conflicts between groups of lower social distance (i.e. groups with close relations), conflict will often take the form of revenge or honor killings, where combatants will seek to minimize secondary casualties and property damage (Solometo 2006:29). However, the practice of raiding in pursuit of prestige goods, or forms of portable wealth or resources, for example "cattle rustling," may also result in minimal architectural damage or direct casualties (Keeley 1996; Kelly 2000). So, is war between groups of low of social distance usually carried out by smaller groups? These dimensions likely have strong co-variance, but there may be exceptions as well: the framework is useful for thinking with, but all correlates need to be contextualized. These dimensions of war do not provide hard rules by which prehistoric war operates, but they help express the tremendous variability in prehistoric warfare and the differential impacts of war on prehistoric societies. Thus they provide a starting point for investigation into and inferences about these practices from the archaeological evidence.

Before exploring the evidence for warfare in prehistoric Cypriot society, it is also necessary to consider the obstacles to such an investigation. Sources of evidence used to identify warfare in prehistory are not universal, but are only present in conflicts that possess certain attributes (see examples in Dolfini et al. 2018). For example, as the dimensions of war reveal, the categories of archaeological evidence most frequently associated with war, e.g. burned sites, destructions, and mass burials, are associated with the practice of war with specific goals, such as conquest or annihilation of a group, or between groups with great social distance. Raiding or ritual warfare, or war between closely related groups, would not be expected to leave this sort of evidence and may therefore be harder to recognize in the archaeological record.

Preservation conditions or the sample size of modern excavations can also obscure the effects of smaller scale or less frequent conflicts. Trauma is underrepresented in skeletal remains[2], as soft-tissue damage is undetectable, and may be further obscured by secondary burial practices or poor preservation (Vandkilde 2006b:57). Weapons made of organic materials, such as prehistoric missile weapons like slings or bows, may not survive in the archaeological record (Capelle 1982), while the missiles themselves may be recycled (if metal), hard to identify (if slingstones), or discovered in low quantities hard to associate with large-scale conflict. Additionally, many weapons are multivalent objects, that also have use in daily life as cutting or hunting implements, as well as serving as symbols of status and wealth, allowing interpretations other than a role in warfare (e.g. Keswani 2004; Philip 1991).

As evidence for warfare, fortification is a highly visible defensive strategy, but when attacks are infrequent or unpredictable, these structures are an expensive strategy that groups may deem an unnecessary investment (Solometo 2006:30; Otterbein 1970). Additionally, archaeologists may not recognize all fortifications as such, instead identifying them as animal enclosures, terrace walls, or storage centers, reducing the recognition of defensive strategies. Potential defensive architecture or architectural features must therefore be carefully assessed (e.g. Jarriel 2017). Groups may also adopt defensive strategies besides fortification, including relocation,

[2] Skeletal trauma, particularly embedded projectile points, perimortem fractures, and unhealed/remodeled cranial depressions, are all interpreted by osteologists as indicators of death by violent means (e.g. Bridges 1996; Jacobi, Bridges, and Powell 1996; Tung 2012), but not all violent deaths result in such visible marks. For example, in analyses of mass graves where one individual shows marks of violent death, the others are believed to be victims of warfare as well, even though they show no skeletal evidence for cause of death (Bridges 1996; Bridges, Jacobi, and Powell 2000:42).

aggregation, dispersal, but these mobility strategies can be difficult to recognize or securely link to a response to warfare. The defensive strategy adopted undoubtedly relates to what the targets of violence are, and what was deemed as worthy of and requiring defense.

In fact, as Wileman (2009:1) states, "nearly every instance of cited evidence [for warfare] can be, and has been, explained away in terms of crime, status behavior, post-depositional effect, accident or some other causal factor." Thus, no one class of evidence alone is sufficient to prove the presence of warfare, and instead we must amass a preponderance of what amounts to circumstantial evidence in order to argue a case for prehistoric warfare (e.g. LeBlanc 1999). With such a goal, Wileman (2009) has identified many possible sources of evidence, what she terms "material correlates," for conflict in the archaeological record. Reducing war to a singular event or warfare to specific episodes of combat, rather than considering war as a process that incorporates causes, conditions, and consequences, misleadingly reduces potential sources of evidence, while hampering our ability to understand the potentially wide-ranging social effects of war. Wileman therefore identifies four categories of sources of evidence that embrace the notion of warfare as a process: causal correlates, preparatory correlates, functional correlates, and resultative correlates (Table 3.2).

These correlates, while useful, are not unproblematic. Much of the evidence for war falls into more than one category; are settlement pattern changes preparatory for war, or the results of war? Was territoriality a causal factor in

Causal (precipitating factors)	**Preparatory** (circumstantial evidence)	**Functional** (direct evidence)	**Resultative** (societal changes)
Climatic deterioration	Fortifications	Site destructions	Subsistence patterns
Demographic rise	Weaponry	Unburied bodies	Trading patterns
Subsistence threats	Iconography	Skeletal trauma	Trophies/memorials
Social threats	Settlement abandonment	Weapons damage	Iconography
Development of territoriality	Defensive settlement strategies		Demographics
Change in access to resources	Settlement form and location		Depopulation
	Trade Changes		Population movement
	Guard settlements		Settlement changes
	Buffer Zones		Cultural Change
	Subsistence changes		Territoriality

Table 3.2 – Summary of Correlates of War, adapted from Wileman (2009: 53-69)

internecine conflict, or did it develop afterwards? Depending on regional and temporal conditions, not all sources of evidence will be available: for example, scholars working in the American southwest have suggested that indirect evidence for warfare in the form of preparations and mobilization for conflict may be more visible than direct evidence for combat, such as casualties and destructions (Haas 1990; Wilcox and Haas 1994). On the other hand, in places where mortuary evidence dominates the archaeological record, mobilization for warfare may remain difficult to identify, while skeletal trauma and weaponry may be prevalent. Also, as already noted, many of these evidentiary sources also correlate with conditions besides war. Wileman's so-called "functional correlates," such as burnt destructions in settlements and skeletal trauma, are arguably the strongest archaeological evidence for combat having actually occurred. However, when found in isolation, even these might also be the results of accidents, interpersonal violence, or individual events, rather than sustained internecine conflict.

Wileman's correlates, like Solometo's dimensions, should therefore not be read deterministically or used as a checklist. Instead they provide a starting point for thinking about what evidence may be available for war in the prehistoric record, and how that evidence might be interpreted: "the present exercise must be approached with caution and acceptance that correlates are only useful in *combination* and in *context,* and that interpretations based upon their presence or absence are only ever conditional" (Wileman 2009:53). These correlates provide a lens through the presence of warfare may be identified, while the dimensions of war remind us that warfare is a highly-variable process that encompasses a wide range of scales and practices. Used in conjunction they provide a framework with which we may reassess the evidence for warfare in prehistory, that will also be applied in Chapter 3 in the analysis of the evidence from the end of the Middle Bronze Age.

Returning to the case at hand, the end of the Middle Bronze Age is frequently referred to as a time of "unrest" on Cyprus, but a reconsideration of the breadth of potential evidence for historical patterns of conflict on the island may provide greater insight into the transformation of society that occurred at this juncture, and more specifically, the role that fortifications and the relationship with the landscape played in that transformation. Proper contextualization of this period and its developments, however, also recommends that I take a longer view. A period of significant unrest does not suddenly occur *ex nihilo*, and yet violence, be it interpersonal or internecine, is little discussed in the context of either the Early or Middle Bronze Age on Cyprus. By stepping back to the beginnings of the period, we may identify changes in Cypriot material culture and practice that set the stage for later developments.

New Competitive Forces: Setting the Stage for Violence

Scholarly accounts of the EC and MC are largely devoid of conflict, but is there sufficient evidence to suggest otherwise? Bernard Knapp et al. (1990) and later Edgar Peltenburg (1996:24) provide a starting point for this reanalysis, when they proposed that changes that occur immediately prior to the EC, specifically the reintroduction of cattle and the adoption of the ox-drawn plough, and advancements in metallurgy, were the driving forces behind the earliest developments toward social inequality on Cyprus. Both cattle traction and metallurgy require significant capital investment: agriculturalists utilizing plow technology must first possess the necessary draft animals and access to suitable fields. Cattle are valuable animals that require large quantities of feed or access to good pasturage to support, while fields suitable for plow agriculture need to be sufficiently large, level, and painstakingly prepared by removal of rocks and stumps at great cost of time and energy, all contributing to their value and scarcity (Manning

1993:46). Peltenburg also suggests that the new metallurgical techniques were adopted specifically "for the control of weaponry for display and coercion," and atypical for archaeologists of Cyprus to the violent potential of the bronze weapons prevalent during this period. Metal production, like plow agriculture, also requires access to raw materials limited by geography and quantity, as well as to specialized knowledge and technology. Limited access to resources creates the potential for wealth accumulation and status differentiation. When these resources are geographically limited, as good farm land and copper sources are on Cyprus, this also creates the potential for the development of notions of territoriality as competition over these resources expands.

After a period of intense contact, including potential colonization, between Cyprus, Anatolia, and the northern Levant at the beginning of the EC (ca. 2500-2300 BCE), evidence indicates that maritime activity and trade with the mainland ceased nearly entirely[3], before recovering at the end of the EC and as the MC period progressed (ECIII-MCII, ca. 2000-1650 BCE: Knapp 1994:281; Webb et al. 2009; Webb 2018). This apparent renewal in foreign contacts is contemporaneous with the re-urbanization of the Middle Bronze Age Levant (Gerstenblith 1983), an increase in seaborne exchange between the Levant and Egypt (Marcus et al. 2008), and most notably, the first textual evidence for Cypriot copper overseas in the Akkadian language archives at the north Syrian sites of Mari and Alalakh (Sasson

[3] Possibly concurrent with and related to the so-called "4.2 ka BP megadrought," which is associated with the collapse of the Anatolian Trade Network, the Akkadian Empire and the Old Kingdom of Egypt, among other societal disruptions (Weiss 2016).

1996; Wiseman 1996; see discussion in Manning 2014). On Cyprus, the evidence for these increased contacts and wealth is primarily found in cemeteries on the north coast, but domesticated animals, exotic goods, and metals increase in importance as forms of wealth across the island.

With the notable exception of a few poorly understood potential "mega-sites" in the later MC (such as Kalavasos *Laroumena* on the south coast, possibly extending over as much as 90 ha, but more likely a discontinuous, though still surprisingly dense, string of smaller occupations), most settlements during the EC and MC were quite small (ca. 2-10 ha.), with populations estimated at less than 500 (Manning 1993:42–43). Archaeological surveys record a dramatic increase from 44 identified sites on Cyprus in the ECI-II to 345 sites in the ECIII-MCII, evidence for tremendous growth in population and infilling of the countryside through the prehistoric Bronze Age (Georgiou 2007:447–448).[4] Such a dramatic demographic rise would likely result in increased resource competition and smaller social distances between adjacent groups as the landscape fills in. Greater social distances would develop between more distant settlements as opportunities and need for interaction decrease. All these changes are potential sources of subsistence and

[4] Giorgos Georgiou (2007) created an invaluable gazetteer of all recorded prehistoric sites on Cyprus, which he used to perform topographic and demographic analyses that are frequently cited in this study. The gazetteer includes cemeteries, settlements, and other site types of various sizes, many of which were haphazardly recorded in non-systematic surveys in the earlier part of the 20th century, so the resulting data is inappropriate for demographic estimates or fine-grained analyses. They do, however, serve as a general proxy for human activity in the landscape, allowing identification of large-scale changes in population and settlement patterns.

social stress, presenting greater opportunities for violent interpersonal and internecine conflict motivated by competition over the resources and mechanisms of social and economic aggrandizement. Intercommunal conflict might also develop as a result of efforts to resist increasing levels of status and wealth differentiation, in an attempt to maintain the status quo (Clastres 1977; Scott 2009).

Greater concerns with private wealth and competitive status were reshaping Cypriot society during this period. While EC and MC settlements do not appear to demonstrate the levels of wealth or status differentiation associated with the development of hierarchical social organization the contemporary mortuary complex was an active arena of competition and display. Diverse assemblages of mortuary offerings, including elaborate ceramic vessels, spindle whorls, stone and metal tools, weapons, and personal ornaments, and even the occasional imported good, accompanied burials. However, variability between tombs even at the end of the MC remains quantitative rather than qualitative, resulting in a rich debate with some scholars viewing the concentration of wealth in particular burials as representing the emergence of elites (e.g. Manning 1993; Webb and Frankel 2010), while others (e.g. Keswani 2004) see no real evidence for structural hierarchy.

In addition to increasing levels of wealth disparity seen in mortuary contexts, within settlements a gradual relocation of workshops and food preparation to indoor areas demonstrates a growing concern with privacy and security (Webb 2009). In earlier periods, communal space was public and unenclosed, and craft production was household based, but by the MC in some settlements, large unroofed courtyards not associated with individual dwellings present evidence for ritual activity, feasting, and craft production (Falconer and Fall 2013; Falconer, Monahan, and Fall 2014), and the first industrial workshop facilities for the specialized production of metal objects and pottery (Pyrgos *Mavrorachi* (Belgiorno 2004; Belgiorno 2009); Ambelikou *Aletri* (Webb and Frankel 2013); Erimi *Laonin tou Porakou* (Bombardieri 2010)).

Portable, high-value objects, like those made in the workshops, make attractive targets for raiding and are useful for acquiring and reward political supporters, while workshop production indicates increasing professional specialization and wealth concentration. Figurines and zoomorphic ceramic vessel decoration during this period dramatically illustrate the cultural value of livestock, another portable form of wealth and potential target for theft. Sporadic raiding can easily develop into longer term endemic warfare, as individual events lead into cycles of revenge (Wileman 2009:36), but this sort of low-grade endemic warfare is difficult to identify in the archaeological record due to its intermittent nature, and because it often results in little damage to architecture and low casualty rates. However, historical and ethnographic analogy demonstrate its prevalence.

Exclusivity and the accompanying concepts of ownership, wealth, and territoriality result in the establishment of social difference, which foments social conflict as competition over access to resources increases, or communities may attempt to keep these forces in check, leveling the playing field via violence. These are all potential correlates for warfare, but only in the sense that they are conditions in which violence is more likely to erupt. Next, I turn to what evidence there may be for the practice of warfare.

Bronze Age Weapons: Making Warriors

Knapp summarizes the current scholarly consensus regarding warfare in the Prehistoric Bronze Age on Cyprus when he stated that the "stability [of society] also seems evident in the lack of fortifications (and the location of settlements in non-defensive positions), the paucity of weaponry (at least until the end of the ECIII – [Keswani 2004:77; Table 4.15]), and the absence of evidence for violent destruction or forced abandonment" (2013:345). It is clear that Knapp is looking for a particular kind of intense, frequent, settlement-focused warfare, that is both sufficiently predictable and severe to force communities to adopt expensive defensive strategies such as relocation or fortification. But this is not the only form that prehistoric warfare can take: ritual warfare, revenge cycles, and raiding may all occur, particularly between groups of low social distance as might be expected of small, proximate villages like those in EC/MC Cyprus, without these kinds of settlement evidence. Considering the entire Early and Middle Bronze Age together as one 700 year-long Prehistoric Bronze Age may also obscure incremental changes in settlement form and pattern that might have served defensive purposes. The (lack of) evidence for violent destruction of settlements is also not as clear-cut as Knapp's statement indicates, as it discounts burnt destructions that occur in settlements throughout the period. Indeed, there is little about Knapp's characterization that cannot be contested, beginning with the characterization of a "paucity" of weapons.

Cemetery	Phase	Total Tombs	Tombs with Weapons	% Tombs with Weapons
Vounous A	ECI	45	18	0.4
Vounous B	ECII-ECIII	26	6	0.230769
Lapithos	ECII-III	35	11	0.314286
Vounous B	ECIII-MCII	52	35	0.673077
Lapithos	ECIII-MCI	38	20	0.526316
Lapithos	MCI-III	23	20	0.869565

Table 3.3 – Number and percentage of tombs containing bladed weapons in the well-documented north coast cemeteries of Bellapais *Vounous* and Lapithos *Vrysi tou Barba*. (data from Keswani 2004).

Although much of the Cypriot mortuary record was looted, or "excavated" without proper documentation, those cemeteries that were excavated and recorded in sufficient detail to allow proper analysis contain significant quantities of weapons even in the earliest phases of the Bronze Age. From three cemeteries where we have the greatest amount of data, weapons did not occur in large numbers per tomb, but they did occur with great frequency, recovered from 40% of tombs even in the earliest phase of the EC (Table 3.3)[5].

Unfortunately, such well-documented mortuary evidence is largely limited to the northwestern coast, but including finds from smaller excavations, there are still

[5] All calculations in this chapter referencing finds from the cemeteries of Bellapais *Vounous* or Lapithos *Vrysi tou Barba* are based on the tables produced by Pricilla Keswani (2004:184-248), which collect and summarize all the data from the various publications of these sites.

more than 588 provenanced EC and MC weapons (Webb and Frankel 2015:118, Table 9.1), of which 131 came from cemeteries other than Bellapais *Vounous* or Lapithos *Vrysi tou Barba.* A great many looted and undocumented tombs also contained weapons, as evinced by the large numbers of unprovenanced weapons found in Western museum collections, including the British Museum, the Ashmolean, and the Metropolitan Museum of Art.

The significance of weapons within the grave good assemblage has not yet been fully appreciated. Scholars following Priscilla Keswani limit the significance of knives, daggers, axes, spearheads and maceheads to their role in the practice of mortuary display. Observing that copper and bronze objects appear far more frequently in mortuary contexts than in settlements, Keswani argues while they were also "used, worn, or displayed by the living… it does suggest that they were deliberately accumulated for mortuary consumption (2004:75)." This emphasis on mortuary deposition may be overstated: it stands to reason that valuable and highly-sought after objects would not be misplaced or casually discarded in domestic contexts. Additionally, old or damaged copper and bronze weapons can be recycled, contributing to the lack of metal weapons recovered from non-mortuary contexts, as only those used as grave goods were safe from being melted down and recast. The pattern in deposition and recovery thus creates a bias in our perception of their use that may not fully reflect lived practice.

Indeed, without a function in lived practice, why would these particular objects have been so desirable as burial goods? And conversely, if these objects granted or marked status in death, would they not also have done so during life? How then were these objects used and what then was their significance in lived practice? I argue that these objects were important in the context of competitive mortuary display, specifically because they were also efficacious in daily life. Weapons within Cypriot burials reflect a society in which internecine violence, and the resulting occurrence of death and burial, are frequent and have resulted in the importance of warrior status, such as is recognized in the Shaft Graves in Mycenaean society or warrior burials in other societies like the Vikings. As the deposition contexts are of limited help, we must turn instead to the material qualities of the objects themselves as evidence for their function and meaning.

Consider first the objects' forms: they are morphologically best suited for use as weapons. Even in the very earliest of the Bronze Age tombs from the Philia period, such as those at Vasilia *Kafkallia*, there were two sizes of bladed weapons: both large spears or swords, and smaller daggers (Hennessy, Eriksson, and Kehrberg 1988). Debate over how these objects were used in the past is reflected in their constantly changing naming conventions. For example, a single-bladed tool is perfectly suitable for cutting, but nearly all Cypriot Bronze Age weapons recovered in burials are double-bladed tools. Though such a form may also be used for cutting, a double-bladed weapon is designed to puncture or stab and is therefore best suited for violence (Keeley 1996:50). A double bladed weapon is also more difficult to produce, requiring a more complicated mold and additional working to sharpen both blades, as compared to a single bladed knife. Despite all this, the smaller double-bladed weapons of the Cypriot Bronze Age are frequently referred to as knives (e.g. Knapp 2008; Knapp 2013; Keswani 2004). This moniker conjures more mundane domestic use than "dagger," which sounds more martial. The terminology adopted by scholars thus contributes to the minimization of interpersonal violence in discussions of the material record.

There are two main categories of Prehistoric Cypriot double-bladed weapons: Hook Tang Weapons (HTWs) and flat-tanged weapons hafted by means of rivets (Figure 3.1). HTWs are generally larger, but sizes of both types vary greatly. Paul Åström, James Stewart and other early scholars classified longer (>39 cm) double-bladed weapons as swords, but the significance of this arbitrary distinction has been called into question (Philip 1991:67). The confusion in nomenclature is apparent even in the publications of primary data, which has then spread to subsequent analyses. At Nicosia *Ayia Paraskevi*, Hennesy et al. (1988) recorded a 12.4 cm long flat-tanged implement (Tomb 9, no. 18. Philia date.) and a 20.1 cm long flat-tanged implement (Tomb 12, no. 4, Philia with a later intrusive MC component) as "knives", and a 42.8 cm Hook Tang Weapon (Tomb 12, no. 6) as a "dagger." In the same publication, the authors call a 21.1 cm long flat-tanged implement from Vasilia *Kafkallia* (Tomb 1 dromos, no. 11, Philia) a "dagger," and a 43.6 cm long Hook Tang Weapon (Tomb 1 dromos, no. 7) a "sword."

Although the exact length at which a double-bladed weapon becomes a sword rather than a dagger is debatable, different blade sizes do create physical limitations. A "dagger" may be short enough to double as a utilitarian blade in daily

Figure 3.1 – *Unprovenanced Middle Cypriot(ca. 1900-1650 BCE) bronze weapons, originally from the Cesnola Collection. L-R: Flat-tanged dagger (1940,0424.10), Axe (1969,1231.10), and Hook Tang Weapon (1969,1231.14). (Image reproduced under CC BY-NC-SA 4.0, © The Trustees of the British Museum*)

life, but swords are too long and too heavy to function as practical domestic knives. The modern chef's knife, the largest cutting blade in most present day households, is only 20-25 cm long and is still longer and heavier than the knives used by modern hunters when processing their kills. Compare this to HTWs, most ranging in length from 22-40cm, with larger examples as long as 66 cm (Webb and Frankel 2015:119), and it is clear that many HTWs were impractically sized for daily use as cutting implements.

Another important consideration, though sadly lacking in evidence, is how the weapon is hafted. A short-handled weapon such as a dagger or sword requires proximity in use that is not conducive to hunting: they are designed for use in combat. Daggers are more likely to be a backup to a larger primary weapon or used for defense. Longer blades are specialized for use in interpersonal violence, allowing a combatant to deal more damage by both thrusting and slashing while maintaining greater distance from an opponent. Variability in blade and tang forms in Cypriot Bronze Age weapons suggests a variety of hafting methods. In the Cyprus Museum, a HTW has been hafted with a wooden handle like those seen in contemporaneous ceramic weapon models, thus producing a sword-like weapon. Philip (1991) argues however, using analogy with similar weapons in the Levant, that Cypriot HTWs were hafted as spearheads, rather than sword blades. If this identification is correct, it in no way diminishes the capacity of HTWs as weapons. Spears can be used as thrown or thrusting weapons, and HTWs with their leaf-shaped blades, sharp points, and pronounced mid-ribs are more likely to have been used for thrusting (Webb and Frankel 2015:119). Their use then would require a certain proximity to the opponent, generally making them impractical for hunting except against larger or more aggressive animals (Keeley 1996:50). Red Deer, the largest animal hunted on Cyprus, are fast and skittish, greatly decreasing a spear's effectiveness in Cyprus' woodlands, so hunters more likely used missile weapons, such as slings[6] or bow and arrow. Spears, however, were revered as powerful and deadly weapons of war during the Bronze Age; In the Iliad, no less than 139 fatalities are the result of hero-

[6] For the possible prevalence of slings and slingstones in the Eastern Mediterranean in the Bronze Age and the difficulty in identifying them archaeologically, see the discussion in Vutirpulos, N. 1991. "The sling in the Aegean Bronze Age." *Antiquity* 65, pp. 279-286.

wielded spears (94 thrusts, 40 thrown), as compared to just 39 fatalities by sword (Adamson 1977:94).[7]

Other arguments for the use of Cypriot copper and bronze weapons focus on their symbolic role. Many of the weapons found in tombs show use-wear[8] and even evidence for sharpening or reworking, but there is also evidence that some weapons were never used at all, supporting arguments for their exclusively symbolic, rather than practical use. There has been no systematic study of use-wear on Cypriot Bronze Age weapons, but one apparent case of unused weapons comes from Tomb 21 at Pyrgos *Mavrorachi*, an ECIII-MCII settlement. Here two unused tin bronze daggers were identified as having casting defects (Giardino, Gigante, and Ridolfi 2002:44; Keswani 2004:75), which likely account for the daggers' unused condition. Rather than evincing symbolic use of all weapons, the use of defective specimens in mortuary ritual would have allowed functional weapons to remain in circulation.

Despite the affordances and limitations of these weapon forms, scholarly discussion of EC and MC blades focuses on them as prestige objects in mortuary display (Keswani 2004; Philip 1991; Knapp 2013:321) or as examples of

[7] "Idomeneus stabbed Erymas in the mouth with the pitiless
bronze, so that the brazen spearhead smashed its way clean through
below the brain in an upward stroke, and the white bones splintered,
and the teeth were shaken out with the stroke and both eyes filled up
with blood, and gaping he blew a spray of blood through the nostrils
and through his mouth, and death in a dark mist closed in about him." Iliad XVI (403)

[8] Sarah Douglas has performed use-wear analysis on Bronze weapons from Cypriot Middle Bronze Age tombs and has determined that most, if not all, of the weapons had been used, possibly in combat. The results of this study will appear in her forthcoming dissertation, to be submitted to the University of Manchester.

metallurgical technology (Balthazar 1990). Their value as prestige objects is presumed to be based on their material composition: copper in the Philia and EC, and increasingly tin bronze in the MC. Undoubtedly part of their allure as status markers in the competition for prestige was their metal, but if the material was the defining feature in value and status, why then were these forms chosen? Other objects, equally or more suited to display, such as jewelry (e.g. bracelets), clothing accessories (e.g. pins, belts), or hair ornaments (e.g. hair spirals) were also made from copper and bronze, but occur far less frequently. Failing to consider why these specific forms were chosen largely obscures the possibility that their value as mortuary display objects was rooted as much in their function and use-value in the context of combat.

The symbolic importance of double-bladed weapons is also supported by the presence of ceramic models of daggers and sheathes (Figure 3.2).[9] Ceramic imitation weapons were made of Red Polished ware, the color and shine of which would invoke the copper and copper alloys from which the objects that they modelled were made. This suggests that characteristics of the metal were an important feature

[9] There are at least a dozen known Cypriot EC terracotta models of daggers and sheathes. 7 come from *Vounous*, 1 from the cemetery at Karmi *Palealona* (also on the north coast), and the rest reside in museums or private collections, without provenience. Based on the ceramic ware, the typology of the decoration, and the other finds in the tombs from examples with known provenience, Stewart (2012:188) and Tatton-Brown (1981:1) argue that the earliest example dates to the ECI (ca. 2300-2075 BCE), while the majority belong to the ECII (c. 2075-2000 BCE), and two may date to ECIII (c. 2000-1900 BCE).

Figure 3.2 - *An unprovenanced RPII dagger and sheathe model, most likely from a cemetery on the North coast. (British Museum 1979.1214.1). (Image Reproduced under the CC BY-NC-SA 4.0 license, © The Trustees of the British Museum)*

of the objects, as they too were imitated. Yet there are no ceramic models of other common metal objects such as adornments or domestic tools, so it was not just the metal but form of the dagger that was worthy of imitation. In the cemeteries at Vounous the proportion of tombs containing bladed weapons drops between the ECI and the ECII-III phases from 40% to 23% (see Table 3.3), but if ceramic models are included in the count, the percentage of ECII-III tombs containing weapons increases to 35%. This is comparable to the 31.4% of tombs at Lapithos in the same period, where ceramic models are not found, demonstrating that the importance of weapons as mortuary offerings had not decreased, but rather that Vounous had less access to metal weapons or viewed them as less expendable.

There is also evidence that Cypriots were concerned with the danger inherent in the double-bladed weapons: 38, or 18.4 %, of provenanced HTWs appear to have been ritually "killed" by intentional folding or breaking of the blade, bending the tip over, or bending the tang so it could no longer be hafted (Figure 3.3). 67, or 22.3%, of provenanced flat-tang weapons also seem intentionally damaged. Webb and Frankel (2015) recognize this practice as an attempt to prevent the effective use of the objects, and believe it related to the close, personal relationship between the individual and the weapons seen in the placement of the objects relative to the body in the burial context. Considering these treatment and deposition patterns of weapons, why would individuals have close personal relationships with weapons, especially if those weapons are only valuable for their metal content? Weapons are material correlates of, and participants in, interpersona violence, and therefore "killing" these objects would also remove their efficacy, just as their owners were removed of their agency by death. That the threat posed by these blades was grounded in practice, rather than purely symbolic in nature, is supported by the frequent inclusion of whetstones in burials containing weapons,[10] begging the question, why would a symbolic weapon, or a weapon only used to display metal wealth, need to be sharpened?

[10] Two whetstones also accompanied the sword-length HTW and dagger-length riveted flat-tang weapon deposited in the Philia period Tomb 9 at Vasilia *Kafkallia*. Of the 45 intact or well-preserved tombs from the Early Cypriot I Cemetery A at Bellapais

Figure 3.3- *An unprovenanced Cypriot Hook Tang Weapon (Metropolitan Museum 74.51.5016). The bent blade may be the result of ritual "killing"of the weapon. (Reprinted under Creative Commons Zero license, © Metropolitan Museum of Art)*

The discussion up to this point has been limited to bladed weapons, but these are not the only weapon forms in Bronze Age Cyprus. Metal axes appear as early as the Philia (see example from Tomb 104 at Vasilia *Kafkallia*) and become more common throughout the Bronze Age. In the final phase at Lapithos, nine tombs contained axes, with an average of three per tomb. Although axes may be used for clearing land or woodworking, these are unlikely activities to have been considered prestigious. Referring to the stone axes of the European Neolithic, Keeley (1996:50) argues that "these implements were male status symbols because, whatever other purposes they may have had, they were weapons," and admonition that holds true for the impressive copper axes of the Cypriot Bronze Age, as well.

Vounous, 17 (38%) contain knives/daggers or HTWs. Of these, nine included whetstones (Keswani 2004:197, Table 4.7).

One more weapon-type needs mention here: the mace. Although maceheads occur less frequently in EC and MC tombs than other weapons (just 5 times in Lapithos and Vounous), the mace is distinctly less ambiguous evidence for interpersonal violence than possibly multi-use tools such as spears and daggers. Maces are used in close combat, dealing crushing and crippling blows to the skull and limbs, and are entirely unsuited for hunting. Maceheads are recorded from other cemeteries, many without full provenance,[11] but most interestingly, these weapons are also well-attested in settlement excavations, including a limestone example from the EC settlement at Sotira *Kaminoudhia* (Swiny, Rapp, and Herscher 2003:226, Object S275), and a striking black serpentine macehead [S610] recovered at the EC settlement at Marki *Alonia* (Frankel and Webb 2006:211–212, Table 6.10, Fig. 6.3, Pl. 55). There is also a small unpublished macehead made of a coarser basaltic stone and with simple incised decoration from Gjerstad's excavations at Alambra *Mouttes* (Figure 3.3).[12] These weapons were clearly not produced solely for the brief spectacle of mortuary ritual, as they were present in domestic contexts as well.

Frustratingly, nearly all evidence presented so far has come from the cemeteries at Lapithos and Vounous. Located on the north coast of Cyprus, as is the cemetery at Vasilia, their size and extent of publication has been the source of much unintentional regional bias in Cypriot archaeology. In an important step

[11] See Frankel and Webb (2006:212) and Stewart (2012:206–207) for comparanda.

[12] I recorded this artifact in the collections at the Medelhavsmuseet. It was one of the few objects attributed to Gjerstad's 1924 excavations at Alambra, but there was no other documentation. The provenance suggests a date between ECIII and MCIII.

towards correcting this bias, in 2008 the Department of Antiquities excavated 47 undisturbed tombs in the short-lived ECI-II (ca. 2300-2200 BC) cemetery at Psematismenos *Trelloukas* in the Maroni Valley on the south coast of the island, where only two tombs contained dagger/spearheads (Georgiou et al. 2011:305). Other rescue excavations have not been fully published, but Webb and Frankel also recorded 28 weapons from the EC-MC cemeteries at Kalavasos (Webb and Frankel 2015:119, Table 9.1) from a total of 84 excavated tombs (Keswani 2004:187, Table 3.1). These numbers suggest that the high quantities of metal burial goods in the northern cemeteries may be regionally determined, but the prevalence of weaponry increases through the EC and MC even in the south, while proliferation may be associated with specific communities.

Figure 3.3 – (*Left) A small macehead reportedly from Alambra Mouttes, with incised decoration and traces of black pigment (Photo by author, from the Medelhavsmuseet collections). Right - One of several highly-polished Cypriot gabbro maceheads with no provenance in the Metropolitan Museum (74.51.5016) (reproduced under Creative Commons Zero license, © Metropolitan Museum of Art)*

Weapons were clearly important components of the burial assemblage and had value as display objects in mortuary ritual, but it appears that access was not strictly limited to a small segment of the population, unless the tombs are already limited to a special class of person. But even if chamber burials were so constrained, the numbers of recovered weapons demonstrate that instead of a "paucity," weapons were present throughout the prehistoric Bronze Age and across the island. The presence of maceheads, weapons only used in human combat, in both settlements and cemeteries is strong evidence that weapons were not just prestige mortuary objects, and maceheads and ceramic dagger models demonstrate that the value of a weapon did not reside exclusively in its material. The proliferation of Bronze Age weapons indicates that their ability to convey status rested instead in both form and function: as tools that were, at least potentially, used in violent conflict with other individuals or groups. Frankel and Webb (2015) see these objects, particularly the larger HTWs, as an important expression of the personal identity of the deceased. This appears true, but the identity expressed by weapons intended for violence is that of a warrior, prepared for battle.

Settlements and Skeletal Trauma: Direct evidence for combat

No fortifications on Cyprus are traditionally dated to the Early or the earlier phases of the Middle Cypriot. This would suggest that what conflict did occur during this period was sufficiently infrequent and unpredictable that the Cypriots deemed such expensive investments of labor and materials in defense unnecessary

(Otterbein 1970), despite the increasingly sedentary nature of society indicated by the use of plow agriculture, increased settlement density, and the use of extramural cemeteries. But excavations of settlements from this period still provide a few lines of evidence that point to intermittent conflict.

First is the evolution in settlement layout and location. During the Chalcolithic period, settlements consisted of loose aggregations of individual, single-roomed, round structures. In contrast, EC settlements, exemplified by Sotira *Kaminoudhia* (Swiny et al. 2003) in the south and Marki *Alonia* (Frankel and Webb 1996; 2006) in the central region, were tightly packed sub-rectilinear structures with many shared-party walls and narrow alleys. There was little strategic advantage in the topographical situation of these sites, located in valleys surrounded by steep hills, but the enclosed site plans would have provided much more security in case of attack than the open plans of the Chalcolithic. In the MC, Alambra *Mouttes* (Coleman et al. 1996) and Politiko *Troullia* (Falconer and Fall 2013; Falconer, Monahan, and Fall 2014) have dense clusters of orthogonal structures, but also dispersed, larger houses, with no tactical advantages. However, both these settlements are located, if only partially, atop high hills where sweeping views of surrounding territory would provide early warning of attack. Whether these changes in settlement organization were direct responses to security concerns cannot be determined, but there is a pattern of increasing defensibility in their design, which continues through the MC with advantageous topographical siting and the addition of possible enclosure walls at some sites (discussed in Chapter 3).[13]

As evidence for internecine conflict, archaeologists look for settlement destruction, which are not conspicuous in the Prehistoric Bronze Age on Cyprus, making it difficult to speak conclusively of attacks. The dramatic increase in the number of sites between the ECI-II to the ECIII-MCII indicates tremendous growth in population (Georgiou 2007:447–448), but continuity in site occupation through this period shows that if conflict occurred, it was not severe enough to cause much depopulation or site abandonment. This is not to say that there is no evidence for destructions in Early and Middle Cypriot settlements. Though there are only five Prehistoric Bronze Age settlements excavated with final publications, all five have evidence for burnt destructions of varying severity, although this fact has previously gone largely unnoted (cf Monahan and Spigelman 2019).

Two well-documented settlements with EC and MC occupations are Alambra *Mouttes* and Marki *Alonia*. Excavations at both sites produced evidence for burnt destructions during this time frame, yet the principal excavators of neither site identified the evidence as such. At Marki *Alonia,* the excavators report that the northern portion of the site, the primary focus of investigation, went out of use in the ECIII or MCI, having been abandoned systematically and peacefully. The inhabitants had time to clean out the domestic areas before they left, leaving little

[13] Jennifer Birch (2010:34–42) identifies a similar development in settlement siting, coalescence, and fortification among Northern Iroquoian groups during the period prior to European contact.

material *in situ* (Frankel and Webb 1996:48). However, the significantly smaller excavations in Areas I-IV at the south end of the site contain the burnt destruction of an architectural unit and accompanying deposits dating to the MCII (Frankel and Webb 1996:28–29, Pl. 5a; Frankel and Webb 2006:41).

Similarly, Area A at Alambra *Mouttes* was the primary focus of excavation in the 1980s, where evidence indicates the abandonment of the site during the MCII (Coleman et al. 1996). In 1924 however, during his early dissertation research, Einar Gjerstad (1926:23) excavated an ECIII house on the west side of *Mouttes*, which he reported as having ended in a conflagration. In more recent years, the Cyprus Department of Antiquities has also completed rescue excavations southeast of Area A that uncovered a burnt destruction layer within an architectural unit likely dating to the MC (Georgiou 2008:134).

At Sotira *Kaminoudhia*, a PreBA settlement in the south of Cyprus, the excavators identified the abandonment of the site following a catastrophic destruction during the ECIII. The excavators attribute the damage to an earthquake, due to the unidirectional southward collapse of multiple walls within the settlement. The excavators also recorded skeletal remains found in three rooms, several collapsed roofs, at least one of which was burnt, and all areas of the settlement contained extensive burning, including thick ash deposits and burnt chipped stone (Swiny et al. 2003:53–54).

The two other settlement sites with occupations during this period, like *Kaminoudhia*, also have evidence of significant destruction resulting in their subsequent abandonment. The first, Ambelikou *Aletri* was a short-lived community in western Cyprus with evidence for specialized metal and pottery production facilities. Based on both radiocarbon and ceramic typology, occupation of the site began during the MCI and lasted no later than the early MCII.[14] Two areas of the site, separated by 150 meters, were excavated and both demonstrated evidence for "sudden and catastrophic" abandonment, with many intact or restorable objects found *in situ*, and one area containing evidence for severe structural collapse and burning (Webb and Frankel 2013:225). This situation is repeated at the site of Pyrgos *Mavroraki*, in the southern foothills of the Troodos, where the Italian excavation project reported structural damage and conflagration, followed by immediate abandonment. They report a radiocarbon date for this destruction of 1850 BC,[15] in the middle of the MCI (Belgiorno 2004:21; Belgiorno, Ferro, and Loepp 2012:26).

In both cases, like *Kaminoudhia*, the excavators[16] attribute the destructions to earthquakes followed by fire, resulting in immediate settlement abandonment.

[14] Frankel and Webb identify the destruction of Ambelikou as occurring during the late MCI or MCII, the horizon between which is presently assigned to 1800 BCE (Manning 2013). However, the two radiocarbon determinations from the burnt destruction date to ca. 2020 BCE +/- 150 years. There are very few radiocarbon dates available for the Bronze Age, but this may indicate that the ceramic markers typically identified as correlating with the MCII occur 100 years earlier than previously expected. A similar problem in correlation between ceramic and radiocarbon chronology may occur at Politiko *Troullia* (Falconer, Steven: personal communication) and Kissonerga *Skalia* (Crewe, Lindy: personal communication), which could indicate that the MC chronology as a whole requires further reconsideration.
[15] The range and uncertainty for this radiocarbon determination are unpublished.
[16] The final publication of *Mavroraki* is still awaited, so interpretations are taken from preliminary reports by Beligiorno and collaborators. Porphyrios Dikaios excavated

However, Webb and Frankel (2013:225) astutely note that the lack of resettlement at both *Aletri* and *Mavroraki* is peculiar, and the same is true for *Kaminoudhia*. Following an isolated incident like an earthquake, were no other forces in play, survivors will typically return to a well-situated settlement to repair and reoccupy buildings, or at least retrieve useful objects and bury the dead. Yet none of these three sites have evidence for attempts at either resettlement or the recovery of property, and bodies remained unburied at *Kaminoudhia*.

Rapid population expansion will result in greater social distances between groups, as larger group sizes result in decreased intercommunal dependence, while also increasing the friction between groups that are competing over limited resources within a constrained geography, potentially resulting in increased severity of violence. More socially distant groups are more likely to intentionally maximize property damage, and to take trophies, including captives, in an effort to annihilate their opponents (Solometo 2006). The complete and immediate abandonment of these settlements immediately following destructions is a pattern for which earthquakes are not the only, or even the most plausible, explanation.

A major hindrance to any consideration of interpersonal violence or warfare in Prehistoric Cyprus is the poor preservation and recording of skeletal remains from mortuary contexts. Most Bronze Age cemeteries were excavated (or looted) without skeletal material saved. Even those more recently excavated and carefully

Ambelikou *Aletri* in 1942, but responsibility for the final publication of the site passed through multiple hands, before it was accomplished by Frankel and Webb in 2013.

documented from which skeletal remains have been recovered have not been the subject of osteological study. Human remains from the Bronze Age on Cyprus are generally in poor condition due to post-depositional processes, intermingled, and more or less incomplete. It was only recently (Osterholtz 2015) that the first systematic bioarchaeological study of Bronze Age Cypriot skeletal remains provided our only, likely unrepresentative, sample of osteological data.

The only cemetery dating to the Prehistoric Bronze Age in this study was the Kalavasos Village cemetery on the south coast, with tombs dating to the ECIII-MCII containing a minimum total of 57 individuals. Within this sample, Osterholtz (2015:161–171) identified 8 individuals (or 14% of the sample) with cranial trauma (CDF, or cranial depression fractures): 4 male, 2 female, and 2 indeterminate. The CDFs of all male individuals are on or above the hatbrim on the frontal bone, a type of injury likely caused by interpersonal violence, possibly during combat (Kremer et al. 2008). Female CDFs occurred to the top of the skull on the parietal, also likely due to interpersonal violence, but presenting the possibility of different patterns of violence involving men and women. There were an additional 4 instances of post-cranial trauma. Although this sample is insufficient to allow any greater chronological or regional resolution of analysis, the research, "shows that interpersonal trauma was present from the PreBA 1 period onward, with both males and females subject to violence" (Osterholtz 2015:238).

A Mounting Case for Violence

All of the evidence for violence and warfare during the EC and MC is arguably ambiguous. Causal correlates are not even evidence for violence, but merely indicate that the conditions were such that violent conflict was more likely to occur. Unlike the other correlates presented in this chapter, burnt destructions in settlements and skeletal trauma are strong evidence that violent conflict actually occurred, but data sets for both are so small as to only allow the observation that violence likely occurred, without indication of the frequency or severity of the conflict. Nevertheless, the high incidence of trauma and destruction even within such small data sets is suggestive.

The proliferation of weapons during this period is also evocative, but again, on its own might not indicate violence, let alone sustained periods of conflict that would more readily be called warfare. Here, the use of clay models and the polished stone maceheads supports the identification of weapons as having bellicose use, by demonstrating that the significance of weapons as grave goods was found in their form, not their metal material, and that at least some weapons were used for interpersonal violence, not only hunting. Again, though, combat and violence alone is not evidence for war.

It is only when all these loose threads are collected and woven together that a picture begins to emerge. To bring that picture further into focus it is necessary to remember the variability in scale and impetus of prehistoric warfare. The wholesale death and destruction that is associated with modern international war is but one form of sustained internecine conflict. Regional conflicts also require complex social organization, banding communities together in alliances, for which there is little evidence at this time on Cyprus, though large communal cemeteries like that at Deneia or settlement clusters like that in the Vasilikos Valley later in the MC may be important exceptions. Localized patterns of aggression, however, such as occur between kinship groups or villages, may be episodic, but they may also become endemic (Wileman 2009:2). Indeed, the conditions on Cyprus were such that could foster competition and conflict. Skeletal trauma indicate that interpersonal violence did occur, perhaps with some frequency, and burnt destructions in settlements suggest that violence may have also turned to group conflicts. Finally, the ever increasing numbers of weapons and the evolution of new settlement strategies point to the cumulative effects on Cypriot society of repeated episodes of violence, or at least the fear of such violence. Burials displayed wealth and prestige through the markers of warrior identity, and settlements moved out of valleys to hilltops where they could monitor their surroundings. As the end of the Middle Bronze Age approached, and the construction of defensive walls and fortresses began apace, violence, possibly even war, had become an ongoing concern on Cyprus.

Chapter 4:
WARFARE AT THE END OF THE MIDDLE CYPRIOT BRONZE AGE

The Late Bronze Age on Cyprus is widely accepted as the period in which state-level society emerged on the island, but the mechanisms by which this transformation occurred are poorly understood and undertheorized. In the preceding chapter, I presented the evidence for increasing episodes of violent conflict and new conceptions of individuality and property during the Early and Middle Bronze Ages. As this period drew to a close, though, Cypriot society still had none of the markers of sociopolitical complexity that would be present in just a few hundred years. Settlement was still limited to isolated villages of a few hundred residents at most, there is little to no evidence for public architecture, and qualitative differences in social hierarchy are not visible in the settlement or mortuary record. But by the middle of the Late Bronze Age, Cypriot society would have a complex settlement hierarchy focused on urban coastal towns, with monumental administrative complexes, other elaborate buildings, orthogonal street plans, and intramural elite burials filled with luxuries and foreign trade goods. This begs the question, what happens in the intervening centuries of the Middle Bronze Age to Late Bronze Age transition (aka MCIII-LCI, ca. 1750-1550 BCE) that leads to this fundamental shift in the nature of Cypriot society.

In this chapter I present the evidence for violent conflict on Cyprus at the end of the Middle Bronze Age, demonstrating that warfare during this period becomes endemic, resulting in a fragmented and contested landscape. Much of the evidence differs from that of the preceding period only in scale or frequency, but there are also new sources of evidence, including changes in settlement patterns and the appearance of fortifications, that demonstrate significant shifts in patterns of violence on the island.

Unlike the earlier or later phases of the Bronze Age, scholars generally characterize the MCIII-LCI as a period of "instability" or "insecurity" (e.g. Peltenburg 1996; Catling 1973; Merrillees 1971; Åström 1972), the primary evidence for which is the proliferation of fortresses across the northern half of the island. "Instability" is a rather unspecific term, which points to the continuing reticence of many scholars to seriously consider the effects of internecine violence on Cypriot society. The discussion of warfare, as such, has been limited to the context of military or defensive architecture (e.g. Fortin 1981; 1983; Wright 1992) or to larger-scale narratives of regional conflict, usually involving the Levant or the Hyksos (e.g. Baurain 1984; Hult 1992; Philip 1991). Most recently Priscilla Keswani envisions "competing factions" (2004:154–157), and Lindy Crewe (2007:65–66) roughly outlines the evidence for "upheavals of some nature." Andrew Sneddon (2014) found the evidence from the earlier Bronze Age on Cyprus to be inconclusive, but does propose that conflict erupts at this time, as is usual presenting the fortresses as the main source of evidence. There has been, however, no systematic consideration of the nature of competition and unrest, which is key to understanding both the construction and function of Cypriot fortresses, and the resulting effects on Cypriot society.

Warfare has long been argued to be a necessary component in the centralization of authority and the development of the state. As early as the late 19th century, Herbert Spencer argued that war was the "midwife of civilization" (1967[1876-896]), while more recently Ian Morris declared, "The plain fact, as Hobbes had understood, is that over the past ten thousand years war made the state and the state made peace" (2014:18). Elizabeth Arkush, an Andean archaeologist, refers to war as the "crucible of the State" (2011:8). She sees two basic processes at work in the various models that relate war to state formation, that may prove helpful when considering the role that fortresses and warfare played in development of Cypriot society.

The first process is conquest, presented in Robert Caneiro's (1970) landmark article, "A theory of the Origin of the State," as "Circumscription Theory." Carneiro saw two types of theories of state formation: *voluntaristic* and *coercive*, the first of which he rejects as failing to demonstrate how groups would voluntarily relinquish their sovereignty. However, violent coercion alone is also insufficient, as there have been many times in history where warfare did not lead to state formation. He argues that warfare would normally divide people, as the victims would naturally tend to "vote with their feet" and migrate away from violence, but in situations where relocation was not an option due to a lack of alternative productive agricultural land or other populations in the way (thus "circumscribing" their movement), losers in war would be forced to submit politically to their conquerors. The resulting polity would be both larger and more hierarchical, with social divisions between the victors and the vanquished, and increased population pressures would force the polity to develop institutions to manage and administer complexity. Carneiro illustrates this model with the coastal valleys of Peru, where suitable farm land was limited, but also sees it in operation in the Valley of Mexico, Mesopotamia, and the Nile and Indus Valleys (1970:736).

More recently, with the growth of agency-based perspectives, theories of state formation have considered the process by which certain agentive actors emerge in times of war. These emergent leaders exploit the opportunities provided by conflict to acquire status and consolidate political power, thereby establishing themselves as leaders, or chiefs, and eventually allowing them to form a new class of hierarchical elite. Opportunities for aggrandizement encompass both leadership roles in combat and intercommunal negotiations, but also in related activities within the group including feasting, mortuary ritual, and the preparations for war, including the construction of fortifications (e.g. Maori - Allen 2006; South America - Redmond 1994; New Guinea - Roscoe 2000). Timothy Earle (2011) is a proponent of this model for sociopolitical development, which he sees exemplified in the formation and growth of various Polynesian chieftaincies, and in the creation of the Hawaiian kingdom under Chief Kamehameha.

As Carneiro also observed, warfare does not always or even frequently lead to increased complexity and centralization (Arkush 2011:10). Most warfare by non-state societies does not result in conquest, as the participants lack the necessary population or resources for conflict at such a scale. Instead they engage in raiding or ritual warfare, in search of redress for grievances, to gain rank or prestige by demonstrating prowess in combat or capturing trophies, or to acquire resources such as food stores, livestock, or captives (Keeley 1996; Kelly 2000; Sillitoe 1978). However, the prestige and rank that certain actors may acquire through these activities also does not automatically lead to the emergence of hierarchy. Frequent warfare in non-centralized societies may actually prevent this, by asserting community autonomy and notions of equality (Clastres 1977; Wiessner 2006).

Clearly, warfare is not a simple unidirectional cause of sociopolitical change. In the case of Cyprus, however, a more complex sociopolitical formation does emerge at the end of a period of protracted violent conflict, so consideration of the role conflict played in the sociopolitical developments that occur is needed. In this chapter I present the evidence for warfare during the MCIII-LCI transitional period on Cyprus, and then utilize this evidence to characterize the changing nature of the conflict. Fortifications appear in this chapter as a consequence, and therefore index, of warfare, but this is far from a complete picture. Later chapters will explore what fortifications *do*, and the active role they play in transforming the landscape and society.

Changing Settlement Patterns and Mass Migration

Between the ECIII-MCII and the MCIII-LCI there is a decline in the number of known sites island-wide, from 345 to 259 (Georgiou 2007). When these numbers are broken down by region, it becomes apparent that major shifts also occurred in the geographical distribution of sites (Table 4.1). The northern and southern regions of the island saw a significant drop, with site numbers in the north decreasing by 72% and in the south by 47%. The east and the west regions mirrors this picture: in the Eastern Mesaoria, surrounding the future urban center at Enkomi, the numbers of known sites increase 250% (from only 4 known sites to 14), while in the western Morphou region, around the LC center at *Toumba tou Skourou,* there is a 27% increase from 22 to 28 sites, and in the southwestern Paphos district the number of sites nearly doubles, from 25 to 45. The central Mesaoria region provides a most interesting contrast, where the number of sites remains basically unchanged between ECIII-MCII and MCIII/LCI, only dropping from 49 to 47 sites, with nearly 2/3 of the sites (33) continuing in use between the two periods. The quantity of sites that are new foundations (14 sites, 29.8% in the region) is greater than in any other region of the island except Paphos, in the far southwest (Georgiou 2011:479).

How can these population shifts inform an understanding of violence on Cyprus? First, the dramatically different demographic patterns between regions clearly indicates that Cyprus should not be considered as a singular unit when considering these processes. However, the abandonment of settlements in some

Region	Sites in ECIII-MCII	Sites in MCIII-LCI	% Change
Eastern Mesaoria	4	14	250%
Western Mesaoria	22	28	27%
Central Mesaoria	49	47	-4%
North Coast	117	33	-72%
South Coast	93	49	-47%
Southwest	25	45	80%

Table 4.1- Changes in number of sites known (primarily from non-systematic field survey) in major regions of Cyprus (adapted from Georgiou 2007).

regions and the founding of sites in others by itself is only ambivalent evidence for large-scale internecine violence: these movements could have been peaceful, and motivated by economic or environmental factors independent of violence or its threat. Georgiou (2011:480) argues that these patterns represent a major shift in settlement focus from a prevailing north-south transportation corridor in the preceding Early and Middle Cypriot Bronze Age, to a new east-west orientation, with the central region remaining as a stable hub of communication and trade. The numbers used in these analyses can represent sites of all sizes and types (settlement, cemetery, sanctuary, or other activity areas) collected through decades of unsystematic survey, so they are inappropriate for use in any fine-grain calculations, such as attempts at real population estimates. However, these data may still serve as general proxies for gauging the amount of human activity in a region, and as such I submit that the large-scale patterns seen in the data represent real demographic trends.

To that extent, the sheer scale of the population movements implied by the data that Georgiou compiled demands more serious consideration and contextualization. In the northern and southern regions 61% of sites that were utilized in the ECIII-MCII were abandoned in the MCIII-LCI, while the eastern and western regions saw a corresponding 71% increase in the number of sites. Although Georgiou identifies the fortresses potential playing a role in interregional relations, it is also necessary to consider where on the landscape the fortresses are located and how this relates to population movement. This is explored further below and in Chapter 7, but for now it is sufficient to note that the greatest concentration of fortifications occurs in the central region, where there is also the greatest apparent stability and continuity in occupation, with 67% of ECIII-MCII sites continuing to be utilized into the MCIII-LCI.

Significantly, of the 14 known new foundations in the central Mesaoria, 9 (or nearly 2/3) are sites identified as possible fortresses. Ethnographic research into historical and cross-cultural patterns in violence indicates that fortifications in small-scale societies are constructed as a response to violent conflict that is sufficiently frequent and predictable as to make the significant investment in labor and materials worthwhile to the community. More specifically when reviewing the evidence collected in the Human Relations Area Files, Keith Otterbein (1970; summarized by Solometo 2006:30) determined that small-scale societies that experience conflict less than once a year do *not* construct fortifications. While there are situations of endemic violence without fortification, in 100% of instances where there was fortification, there was an expectation of being attacked on an at least an annual basis. This well-documented pattern presumably would hold true in Cypriot prehistory, so we likewise must understand that the communities in the central and northern regions constructing fortifications were anticipating frequent, and likely severe, attacks. The lack of fortifications in other regions of the island, however, do not preclude violence. The picture of relative population stability in the central region, where only 33% of sites go out of use, and nearly as many are founded, may also indicate that the fortresses in this region were a successful response to the violence that had been growing during the preceding period (see previous chapter), and acted as stabilizing forces, protecting settlements and other human activity in the region, or otherwise discouraging population movement.

The other broad correlation of note between the geographical location of fortresses and changes in settlement patterning is that 12 of the other 13 fortresses were found in the north, along the spine of the Kyrenia mountains and the Karpas Peninsula, proximate to where the largest proportional and numerical drops in the number of sites occur. In sharp contrast with the pattern in the central region, it appears that the fortresses in the north were not successful in stabilizing the local population, though what forces beside violence were driving population movements or demographic changes remain unknown. The settlement patterns in the east and west regions also behave differently, with increases in the numbers of known sites and entirely without known fortifications, with the single notable exception of the blockhouse structure at Enkomi. This pattern contrasts sharply with the central region, raising significant questions about the role of fortresses in different regions. How did fortresses relate to local settlement patterns? What were they built to protect? The pattern in the changing demographics on the island suggest that these questions should be considered on a case by case, or regional, basis.

Such apparently large scale demographic shifts are suggestive of migration. However the reasons for migration are always complex[1], and identifying the proximate causes in prehistoric cases may be impossible. However, using modern migration studies as a guide, it may be possible to identify the conditions that would favor migration in the past (Anthony 1990:899–900). Migrants can be divided into non-mutually exclusive categories based on their motivations: environmental, economic, and cultural/political and these motivations can also be divided into push and pull factors: one may be fleeing one factor while attracted by another (Lee 1966).

Environmental factors may have played a role in "pushing" the MCIII-LCI population movements, but there is no conclusive evidence for climate or environmental change on Cyprus at this time that was severe enough to drive Cypriots to abandon their villages. Warm and dry conditions occurred up the Levantine coast and in the Near East in the immediately preceding period (ca. 1950-1750 BCE: Finkelstein and Langgut 2014), which may have alleviated the formerly

[1] And of necessity this discussion oversimplifies the matter. Modern theorists of migration (e.g. Massey et al. 1993; Castles, Haas, and Miller 2014) call attention to additional important social factors in migrations, such as previously existing kinship or economic ties with the destination.

swampy and likely malarial conditions in the alluvial fans in the eastern and western Measoria, making the regions more appealing for settlement. A long gentle warm and dry period could simultaneously have negatively impacted agricultural regions that relied on rainfall moisture, as much farmland in semi-arid regions like Cyprus is marginal and prone to drought (Manning 2019), so that multiple bad years in succession might encourage more entrepreneurial (or desperate) agriculturalists and pastoralists to relocate to regions with reliable perennial water sources. Indeed, during the MCIII-LCI the eastern and western coastal regions saw the foundations of major coastal centers at *Toumba tou Skourou* and Enkomi, adjacent to major river outlets, while the cluster of settlements and fortifications of the Agios Sozomenos region that form the central case study of this dissertation are located in close proximity to the Alykos and Yalias Rivers. Additionally, the expansive plains of these regions would have been more conducive to large scale cattle-driven plough agriculture than the rough foothills of the Karpas and Troodos mountains or the conscribed coastal plains of the north and south coasts, providing some additional positive incentive for relocation as the focus of agricultural production changed to larger scale plow agriculture and centralized storage and redistribution of staple goods, suggested by the large-scale storage facilities identified in LC settlements. These factors could have contributed to "pull" of the Mesaoria, but as there is no evidence that the northern and southern regions had become significantly less suitable for habitation, the scale of the demographic shifts indicates more than environmental factors drove the observed changes.

In modern migrations, the most common push factors are economic, with significant differences in economic opportunities between regions motivating relocation (Lewis 1982:117). Environmental factors are largely inseparable from economic factors in an agrarian society like that of Bronze Age Cyprus. Access to arable land would be of prime importance, but other natural resources were increasing and decreasing in importance during the Bronze Age and must be accounted for. One likely form of wealth that was increasing in importance was livestock, as Cypriot reliance on wild animals and hunting decreased throughout the Bronze Age (Knapp 2013:305). Increased reliance on animal husbandry, particularly larger herds of sheep and goat or of larger and more expensive cattle, would provide incentive for movement to areas where there was more land available for grazing, and would simultaneously reduce the necessity of access to the wooded mountains, where deer herds would be plentiful. Deer continue to be associated with ritual and elite contexts in the later LC, but ovicaprines and cattle indeed dominate the faunal assemblages of most LC sites, while pig, popular in the earlier phases, appears much less frequently (Knapp 2013:399).

Another major source of wealth in the Bronze Age was copper, acquired from a geographically limited band of pillow lavas in the lower foothills surrounding the Troodos Massif. The Cypriots systematically exploited these resources beginning in the Early Bronze Age[2] and increasing through the Middle Bronze Age, as evinced

[2] It appears that native copper was utilized during the Chalcolithic period, as well as possibly smelting of ores (Gale 1991), but there is no evidence for mining operations at this early date. Given the high incidence of near-surface copper deposits in some

by the steady and significant increase in copper and later arsenical and tin bronze objects utilized as burial goods. It is clear that sites on the north coast, *Vounous* and Lapithos in particular, had established access to copper sources in the Troodos foothills early in the EC. However, exerting actual control over resources, i.e. being able to limit others' access, from such distances would be impossible without an extensive infrastructure for which there is no evidence. Increased competition over access to what was a vital raw material in the manufacture of weapons and personal ornament, as well as one of the most valuable trade goods in the eastern Mediterranean, might have inspired emergent elites to develop strategies to assert more direct control over its procurement and processing – control that would necessitate proximity to the metal resources. Peltenburg hypothesized that the fortresses represented an infrastructure established by the emergent urban settlement at Enkomi to "ensure stable production at the mines and uninterrupted consignments of partly smelted copper" (1996:30), and Keswani and Knapp (2003:219)suggest that *Toumba tou Skourou* may have been a parallel center on the west coast. Interestingly, the Agios Sozomenos fortifications are the closets to the copper sources and yet are still more than 9 km away from the nearest mines. Additionally, as previously noted, the majority of the fortresses are located in the north along the Kyrenia mountains or out on the Karpas peninsula. Only the fortresses in the central Mesaoria, including those at Agios Sozomenos, are located

regions, it is quite possible that the people of the Chalcolithic acquired copper ore and raw workable copper, as surface finds (Peltenburg 1982:54–56; 2011:6).

between Enkomi and the copper sources while none appear to be on routes between the pillow lavas and *Toumba tou Skourou*, making this argument tenuous at best, and there presently is little other evidence to suggest that population movements were tied to copper extraction and processing.

Cultural and political factors can also account for mass migrations. Ethnic persecution, conflict, and dissatisfaction with local leadership can factor greatly into the push to find new homes for individuals or groups. Particularly significant for the current study, large-scale migration is also frequently the result of coercion and violence – conditions where the population feels that "failure to migrate would result in destructive consequences including imprisonment and even death" (Huyck and Bouvier 1983:41). The mass migration out of Syria as a result of the civil war has tragically and dramatically demonstrated this pattern in modern times. Although there is no reason to think that the demographic upheaval evinced in MCIII-LCI settlement patterns was necessarily peaceful, the potential role of conflict and violence in this aspect of Cypriot society's transformation has gone unremarked. Such a drastic change in settlement behavior, which disguises what might have been a brutal dislocation in population, begs the question as to why so many people left their homes in villages that had been settled by their kin groups in some instances for many hundreds of years. Changes in site location alone is insufficient to argue for violence as the proximate cause for these population movements, and only serves as circumstantial evidence. But when other sources of evidence such as settlement destructions, weaponry and warrior imagery, as well as the construction of fortifications are factored into the observed changing settlement patterns, a picture emerges of a society struggling to negotiate violent conflict.

Settlement Destruction and Abandonment

The data available from settlement excavations in the MCIII-LCI are even more limited than that from the preceding EC and MC. Because of the lack of temporal resolution, largely due to a lack of radiocarbon determinations for this period, it is possible that some of the evidence presented here may belong properly to earlier phases of the Middle Cypriot. However, the crux of the matter is that settlement destructions provide some of the best direct evidence for internecine violence, and for a particular type of destructive violence at that, and they were clearly on the rise as the Middle Bronze Age drew to a close. Cattle raids and revenge or honor killings are unlikely to result in damage to domestic architecture. Settlement destructions evince a violence that is directed at the very heart of a community, the homes where families lived and worked, and where subsistence activities vital to the survival of the community were completed and the products of that labor were stored. As discussed in the previous chapter, destructions are identified in the archaeological record by a layer of burnt material or the toppling of architectural features. However, this evidence is not unambiguous: burnt layers may be the result of accidental fires, and toppled architecture the result of earthquakes or the passage of time. Crucial to their identification is a close reading of the stratigraphy, to ensure that the fire or wall-fall occurred while a building was still

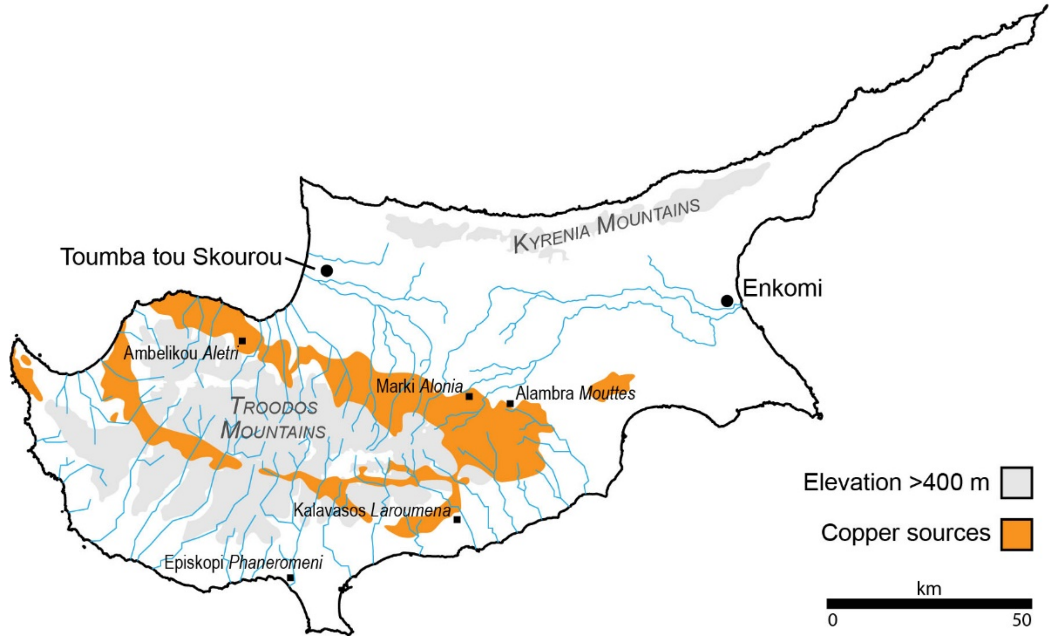

Figure 4.1 - Map of Cyprus with locations of settlement destructions.

occupied. The review of the limited evidence presented here supports a picture of a society where violence was not uncommon, but even ubiquitous.

In the central region, where the north and northeastern foothills of the Troodos meet the Mesaoria, burnt destructions are attested at Marki *Alonia*, Alambra *Mouttes*, and Politiko *Troullia*, in addition to the earlier destruction already described at Ambelikou *Aletri* (Figure 4.1). At Marki, much of the site appears to have been peacefully abandoned earlier in the Middle Cypriot. Units I-IV, located approximately 200 m southeast of the main excavation areas, are the only significant exposure (still measuring only 20 m^2) from the final occupation phase of the site at the end of the MCII. This period was not the main focus of the investigations, so there is limited analysis and data available from these contexts, but the limited exposure appears to have uncovered portions of at least two structures. The building or room called Unit I contained a layer of rubble and mudbrick fall, but this may be the result of collapse after abandonment. Units III and IV are two adjoining rooms in what appears to be a separate structure in the east of the trench. The initial abandonment of these spaces is "marked by accumulations of sediment… with extensive patches of burning evident both on and above the floor" (Frankel and Webb 1996:28–29). There is no evidence for later occupation here, or anywhere else in the site, and two radiocarbon determinations from the burnt layer give an age range for the destruction episode from 1900-1660 BC[3] (Frankel and Webb 2006:35–37).

At Politiko, a workshop area was discovered in Areas M,N, I, and J of *Troullia* West[4], just north of a large courtyard. The workshop contained 5 large (>300 l) broken *pithoi* in situ with black burnt stains, possibly indicating that they contained olive oil that fueled the conflagration. The *pithoi* and other ceramic vessels in the structure, including White Painted III-V juglets and wishbone-handled bowls and Red Slip/Black Slip jugs indicate a late MCII or early MCIII date. The floor of

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[3] All AMS dates from *Alonia* are on individual seeds, with the exception of these two dates. The only datable material from Units I-IV was burnt wood, so there is a strong likelihood that these samples date significantly earlier than the actual destruction. Additionally, a plateau in the radiocarbon calibration curve in this period makes high-precision dates impossible to achieve. Bayesian analyses provide a possible route to improvement in the future, but until we have a greater number of stratigraphically excavated radiocarbon samples we are at an impasse.

[4] This context is currently unpublished, but the directors of the excavations at Politiko *Troullia*, Steven Falconer and Patricia Fall have kindly allowed me to discuss this material here in the context of my dissertation.

the main and adjoining rooms was covered in >10 cm of ash and vessels were found complete, and in some instances even intact. This indicates abandonment immediately following the destruction, without evidence for even a return to retrieve useful objects. The two houses excavated at *Troullia*, in the Eastern and Northern sectors, were also abandoned in this period, although simultaneity cannot be proven. In these contexts, the residents left behind portable stone tools and complete ceramic vessels, suggesting an unplanned and rapid evacuation.

At Alambra *Mouttes*, the Cornell University excavations in the 1980s did not record any evidence for destruction when excavators exposed multiple structures in Area A that were dated to the MCI or MCII. In 2005, the Department of Antiquities undertook rescue excavations as part of a road improvement project in another part of the site. The section cut by the bulldozer exposed buildings dating to the end of the MCII or early MCIII, in which the remains of smashed in situ pithoi were covered with ~10 cm of ash (Georgiou 2008:134), a situation very similar to that found at nearby Politiko. The University of Queensland has returned to the area of this structure for further investigation, but this new project awaits publication.

Outside the central region, there are other violent destructions attested. In the Vasilikos Valley on the south coast, cuts for a new road into the hill at Kalavasos *Laroumena* exposed Bronze Age architecture in profile. Carrying out rescue excavations along a road cut, Ian Todd also discovered thick ash deposits, dark stains, and large quantities of charcoal indicating the fiery destruction of the structure (1993:fig. 3). Ceramics collected from the small excavation support an MCII or MCIII date, although the lack of White Painted ware on the south coast and of robust stratigraphic sequences for the Red Polished ware chronology for the southern region of the island makes a more secure date impossible at this time. Also on the south coast, excavators of the MCIII/LCI site at Episkopi *Phaneromeni* reported a burnt destruction from Area A where, "collapsed walls, smashed pottery, and deposits of ash provide clear evidence that the settlement was destroyed by fire" (Carpenter 1981:62). The excavators reportedly found sherds from the same vessels in multiple rooms, some burnt and some unburnt, indicating that the vessels were broken before the fire. The excavators also hypothesize that these vessels coupled with the lack of metal objects found in the settlement are an indication of looting that occurred before the conflagration. This site also awaits final publication of the ceramics, architecture, and stratigraphy that could help clarify the nature of these contexts.

Finally, in the southeast of the island, the massive (150 ha.) dispersed MCII-MCIII settlement at Kalopsidha also provides tantalizing evidence for episodes of violence. The excavators of Kalopsidha, Einar Gjerstad (1926) and later Paul Åström (1966), proposed an MCIII date for the abandonment of the site, though based on reassessment of the ceramics, Lindy Crewe has subsequently argued for shifting the date slightly downwards, to the early LCI (2007: 50). Åström proposed two explanations for the abandonment of Kalopsidha: either destruction caused by aggression of people from the new coastal center to the north at Enkomi, or simple abandonment when the residents of Kalopsidha relocated to join the same growing center (1966:140). Åström also uncovered a large (~1.5 m thick) wall in Trench 3 at Kalopsidha, which he suggested belonged to a fortification (1966:41; Fig. 21) although this site along with others to be discussed, has never been included in the lists of Bronze Age fortifications. Two 40 cm wide spur walls (Walls B and C) ran perpendicular to the monumental wall, incasing a space designated as Room 2. Åström concluded that this space has been destroyed by fire. Room 2 and Room 1, a partial space on the other site of Wall B, may have been used as storage rooms, as there were 3 large pithoi recovered from Room 2, and two from the portion of Room 1 that had been excavated (1966:47).

Years earlier, Gjerstad had excavated a large structure (~12m x 15m) in another part of Kalopsidha, called site C, approximately 500 m north of the excavations in Trench 3. He identified the 11 room structure as a house, and interpreted evidence of a fire in Stratum 2 of Room 7, near the entrance to the structure, as evidence for the destruction of the house. Following this destruction, a new floor was laid and the house reoccupied briefly before abandonment (Åström 1966: 139). Unfortunately, the ceramics from this excavation became disorganized in storage and when Paul Åström (2001) reassessed them he could only conclude that the final occupation of the house continued some ways into the LCI, so the earlier phase may have been in the MCIII.

Radiocarbon determinations are available for the burning episodes at Marki *Alonia* (Frankel and Webb 2006:36, Text Figure 3.4) and Episkopi *Phaneromeni*

(Fishman et al. 1977:189). The chronologically most recent determinations from Episkopi *Phaneromeni* and the two determinations from Marki *Alonia* are roughly contemporaneous. All three dates have large uncertainties and fall within a pair of plateaus in the radiocarbon calibration curve, so at present provide only a wide date range from ca. 1900 to ca. 1700 BCE for the burnt destructions on Cyprus associated with the transition from the Middle to the Late Bronze Age. Despite the lack of absolute dates for the destructions at *Laroumena*, *Troullia*, or *Mouttes*, the ceramics from these sites indicate that their destructions occurred in the same time frame as those at *Alonia* and *Phaneromeni*.

Most recently, the University of Torino excavations at Erimi *Laonin tou* Porakou have provided tantalizing evidence for deliberate destruction of the extensive workshop complex (Area A) at the site. The settlement area of the site appears to have been intentionally abandoned, with an almost complete lack of ceramic vessels or other artifacts found on the occupation floors, which were covered by deposits indicative of the gradual degradation of the structures (Amadio and Bombardieri 2019:2–3). In contrast, the final phase of the workshop complex is characterized by burnt floors, on which were found intact installations, vessels, and artifacts that were sealed by the immediate collapse of the mudbrick walls, which also show evidence of vitirifcation and oxidation from burning (Amadio and Bombardieri 2019:5) In a study of the abandonment processes at the site, the excavators conclude that the fire in the workshop was intentional, because of the presence of intact vessels and because mud-brick structures are difficult to ignite without accelerants (Harrison 2004). However, they see the configuration of stones and intact vessels in one unit as evidence that this destruction and abandonment were intentional on the part of the inhabitants. Another interpretation would be that the fiery destruction of a large portion of the workshop complex was due to a violent attack, which led to the subsequent abandonment of the rest of the site. It should be noted that this site also has evidence for a large possible fortification wall, potentially indicating an ongoing concern with the threat of attack. Thus, *every* excavated and published settlement with an MCII or MCIII occupation also has evidence for burning or collapse that may indicate acts of violent destruction preceding or at the time of final abandonment.

Mass Graves, Weapons, and Warrior Burials

Mortuary evidence plays a key role in interpretations of the MCIII/LCI period, particularly as excavations of settlements from this period continue to be so few. For the first time on Cyprus, during the MCIII/LCI there are significant qualitative, not just quantitative, differences in tombs and burial assemblages, particularly at the newly founded coastal sites of *Toumba tou Skourou* in the west and Enkomi in the east. These differences include the increase in collective and simultaneous secondary burials discussed below, experiments with new tomb architecture, and the stocking of select burials with rare and finely crafted objects produced overseas from exotic materials (Keswani 2004). These exotica (summarized in Keswani 2005:Table 13), including foreign-made ceramics such as

Tell el-Yahudiyeh juglets, are found at many Cypriot sites, while distinctive contemporary Cypriot-made ceramics, such as Red-on-Black and White Painted wares, are found in increasing numbers in the Levant and Lower Egypt (Maguire 2009). This exchange of ceramics evinces the rapid expansion of external contact and trade in the MCIII, while their inclusion in ostentatious burial assemblages indicates the social significance of access to this trade network. The ceramic trade also corroborates the 19th and 18th c. BCE cuneiform tablets from Mari, Alalakh, and Babylon that record for the first time the metal trade between Alashiya and the mainland (Knapp 1996).

In terms of evidence of physical violence, osteological analyses of skeletal material from this period are not available, as was largely the case for the preceding Prehistoric Bronze Age. Looters destroyed the contents of many tombs, and even in cemeteries that were excavated properly, the early date of most of the cemetery excavations means that skeletal remains were poorly recorded and rarely kept, and preservation continues to be poor. But while trauma on individuals for this period has not been sufficiently investigated[5], there are records of a potential new mortuary phenomenon: mass burials. As with so many things on Cyprus, Gjerstad was the first to note the practice of unusually large numbers of individuals (12-15) having been interred together in a tomb at the cemetery of Politiko *Lambertis* (1926:82). In later excavations, Gjerstad and the Swedish Cyprus Expedition recorded many more

[5] Anna Osterholtz (2015) only analyzed ProBA1 (i.e. MCIII/LCI) material from 2 tombs from Episkopi *Phaneromeni* and 3 from Kalavasos Village, which is an insufficient sample.

tombs with significantly higher numbers of bodies than were expected, particularly Tombs 8, 10, and 14 at Ayios Iakovos *Melia,* which they termed for the first time "mass burials" (Gjerstad, Sjöqvist, and Westholm 1934:302–370). (Sjöqvist 1940:100), who led the excavations at Ayios Iakovos, later suggested that Tomb 8 (2nd layer contained 35 burials) and Tomb 14 (40 burials) marked the beginning of the LCI, and the large numbers of dead was attributable to "one and the same reason – plague or warfare." This interpretation was widely accepted, with subsequent discussion being whether the source of violence was internal or external to the island (Åström 1972:278; Karageorghis 1965:54–56; Baurain 1984:103).

Priscilla Keswani's study of Bronze Age mortuary practices reveals a general trend toward higher occupancy burials throughout the Early and Middle Cypriot. At Lapithos, early group (ECII-IIIA) tombs had a mean of 2.26 burials per chamber, while the late group (MCI-III) had 4.19 (Keswani 2004:Table 4.2). Keswani does not calculate mean burials per chamber for later periods, but utilizing her data (Keswani 2004:Table 5.8) for MCIII-LCIIA tombs in the northern and western part of Cyprus produces a mean of 9.36 burials per chamber. This number is in fact probably even higher, given that the tombs with the lowest recorded MNI are also those with the most uncertainty.

More telling than the gradual increase in mean number of burials, arguably, is how the burials are distributed. Of the 33 tomb chambers recorded, 25 chambers (75.8%) have 9 or fewer burials (with an average of 4.92 burials per chamber), while the remaining 8 chambers (24.2%), all single-chamber tombs, have 14 or more

Site & Tomb	Condition	Min. # Individuals	Pots	Metal Objects	Pots Per Individual	Metal Per Individual
Stephania 5	intact	18	34	2	1.9	0.1
Pendayia 1	intact	34	77	46	2.3	1.4
Ayios Iakovos 8	intact	35	66	20	1.9	0.6
Ayios Iakovos 14	intact	40	41	15	1.0	0.4
Ayia Irini &	looted	37	300	many	8.1	~1
Ayia Irini 21	looted	14	140	37	10.0	2.6
Ayia Irini 20	looted	15	70	14	4.7	0.9

Table 4.2 - MCIII/LCI "mass burial" tombs reported from the north coast with summary of individuals buried and proportional quantities of grave goods. (Adapted from Keswani 2004: Table 5.8)

burials (with an average of 22 burials per chamber). Counting only interments that appear to have occurred within a chamber simultaneously or near-simultaneously, there are 7 mass burials attested: one from Myrtou *Stephania* (14+ individuals), one tomb at Pendayia *Mandres* (34), two tombs at Ayia Irini *Paleokastro* (15 and 14) and one inland (37+), while at Ayios Iakovos *Melia* 2 of 9 fully excavated tombs contain "mass burials" (both with 35 individuals) (summarized in Table 4.2). Keswani (2004) argues that the mass burials proceed naturally from within the normal tradition of secondary burial practices on Cyprus during the preceding periods, i.e. a practice of mass re-interment functioning as a conspicuous prestige-building social event and as an expression of communal identity.

Certainly, secondary mortuary treatments are well attested in earlier periods as well, but nowhere near on this scale. The infrequency of these massive simultaneous interments also suggests that they were unusual events. Mass graves are frequently associated with warfare, as the result of specific conflict events that require the mass internment of multiple casualties. Like other evidence for warfare, however, context is vital to interpretation, because, "A communal burial alone does not constitute evidence for a violent cause of death. Other factors such as a serious infectious disease or ritual depositions may also explain why several persons died within a short span of time" (Smits and Maat 1993:24–25), and the Cypriot tradition of secondary mortuary treatments further confounds the question of whether those buried together died simultaneously. The lack of osteological records from these burials prevent us from identifying potential trauma associated with their deaths, and to my knowledge no scholar has suggested that these burials are associated with ritual sacrifice (murder or suicide).[6]

The deposition patterns of burial goods with these mass burials is unusual, but I would argue there is nothing that clearly points to a special ritual deposit. Using pots and metal objects as proxies for tomb wealth, of the so-called mass burials only Pendayia Tomb 1 contained large numbers of weapons - of the 47 recorded metal objects, 23 are HTWs or knives, along with 4 polished stone maceheads, equaling approximately 0.8 weapons per identified individual. The mass burials at Ayia Irini were accompanied by relatively large numbers of grave goods including metal, but very few weapons, although these tombs were all reportedly partially looted, so it may be assumed that there was more material originally. Of the

[6] Though perhaps this is due to the apparent general reticence to explain any archaeological evidence in the Cypriot Bronze Age with violence.

three mass burials at Ayia Irini, only the tomb recorded as "Tomb &" contained significant quantities of weaponry (3 HTWs, 4 daggers, and an unspecified number of "maceheads"), associated with the partial remains of 37 individuals. Interestingly, the goods that were found in the looted tombs at Ayia Irini include gold and silver jewelry, carnelian and faience beads, imported Helladic vessels, and even ivory and an ostrich egg. This contrasts sharply with the remaining mass burials, where burial goods in general and metals in particular, were found in very low numbers per individual interred. In fact, the differences in the mortuary assemblage among the various mass burials is such that no pattern may be readily identified, and is uncompelling evidence for an island-wide phenomenon of mass internments.

These numbers paint a picture more nuanced than a simple continuation and elaboration of previous burial practices. Secondary treatment was clearly an increasingly important component of burial ritual, but the gross and per capita inclusion of weapons in burials decreased during this time period. In some cases, there were few goods at all in these later burials, and in others new types of prestige goods were taking their place, including ivory, gold, and other exotica. Simultaneously, there was a dramatic increase in the number of burials per tomb, even discounting the pattern of so-called mass burials, which would drop off again later in the Late Bronze Age. In explaining this pattern, Keswani suggests that "participation in copper exchange networks led a heightening of competitive social displays in the context of ritual celebrations" (2004:140). But if this is true, why would heightened social displays involve mass interments with low quantities of metal goods? In instances where there are large numbers of individuals buried with few burial goods, violence and the need for rapid burial of large numbers is a possible explanation. The decreasing number of weapons as burial goods could point to a desire to keep valuable, and useful, weapons in circulation, but it might also represent a change in values and prestige goods, as precious metals and imports become more prevalent.

Figure 4.2- *Cypriot BA weapons and other bronze implements. To the left are Hook-Tang Weapons, at the bottom is a shafthole axe, and immediately above the axe are two flat-tang knives or daggers. (Metropolitan Museum of Art collections, reproduced under the Creative Commons Zero 1.0 license)*

Another development in the MCIII/LCI mortuary record possibly associated with violence is the occurrence of 14 shafthole axes (Figure 4.2), sometimes accompanied by "warrior belts," in burials in the central region of Cyprus. These high-status objects are similar to those found in contemporaneous high-status "warrior burials" in Syria-Palestine, with their best parallels found in MBII tombs at Ugarit (Philip 1991:80-83). However, the Cypriot examples are of a unique type only found on Cyprus, suggesting they are of local manufacture, although their manufacture from true tin-bronze in innovative two-pieced molds also marks them as special (Buchholz 1979:88; Balthazar 1990:370; Philip 1991:83). Another curious, but rare practice that may be associated with these "warrior burials" is the inclusion of equid bones and teeth (Keswani 2004:72; e.g. Politiko Chomazoudhia Tomb 3 - Gjerstad 1926:81; Ayia Paraskevi Tomb 14 - Myres 1897:135–138), possibly related to the burials of horses or entire chariot teams in elite burials in the Near East and Caucasus (Feldman and Sauvage 2010; Pogrebova 2003). Scholars see these objects as signs that Cypriot elites were adopting and adapting "the standard symbols of power of the Levantine MBA" (Philip 1991:85; also Courtois et al. 1986:74–79), and displaying "their symbolic linkage with more powerful foreign elites" (Keswani 2005:392).

Copper axes were not infrequent components of earlier MC burial assemblages, on which grounds Keswani argues that the bronze shafthole axes appearing in the later MC should be understood as, "perhaps a traditional symbol of authority in Cyprus… now elaborated in form and quality, and… further envalued through association with more powerful and prestigious foreign elites." She proposes that this whole assemblage of practices and materials were transmitted as a package via personal interactions with foreigners, and the significance of weapons as status symbols was conveyed through familiarity with Near Eastern iconography, where warriors and gods wield axes, and maces appear as regal paraphernalia (Keswani 2004:80). In this pacified vision of the MCIII/LCI, weapons continued to be "symbols" and valuable, because of how other peoples valued and used them, but there is still no discussion of violence or warfare. By couching it in terms of emulation, Keswani presents the Cypriot practice as mere imitation, without considering the motives of the practice beyond abstractions of "value" and "status."

Shafthole axes, equid bones, metal belts and other weapons were associated with "warrior burials" in Syria-Palestine, a region where conflict, and the construction of fortifications, was flourishing. Incidentally, on Cyprus the shafthole axes, also sometimes accompanied by bronze belts or belt ornaments, are recorded exclusively from tombs in the central region, [7] where the highest concentration of fortifications is located. The shafthole axes, as the fortresses, are evidence that internecine violence that erupted on Cyprus earlier in the Bronze Age was intensifying, giving Cypriots and their Levantine neighbors a shared sociopolitical context in which similar value systems had also arisen: warriors had social status,

[7] The only fully documented examples come from Politiko *Chomazoudia* and Dhali *Kafkallia*, while other pieces are reported to have been recovered from Alambra and Nicosia *Ayia Paraskevi*. The rest are without provenance (e.g. the Cesnola Collection in the Metropolitan Museum of Art).

weapons were status symbols, and both because of their capabilities in conflict. Instead of contextually vacant emulation, the appearance of these objects and practices on Cyprus at this time should instead be seen as a process of adoption, in which their owners were cognizant of their use and significance. These objects' value as status symbols was undoubtedly augmented by their ties to important, and profitable, foreign relations, but appreciating their full significance requires proper contextualization: weapons and warriors were accorded status because of their instrumental roles in violence, and the importance of violence in society.

One weapon type mentioned above and in the previous chapter requires brief discussion: the mace. This weapon-type with the strongest direct association with interpersonal violence appears in record numbers in burial contexts of this period. 4 of 9 fully excavated MCIII tombs at Ayios Iakovos *Melia* contained maceheads. 2 of 6 at *Toumba tou Skourou* contain maceheads. Both MCIII tombs associated with the fortification at *Nitovikla* contain maceheads (2 in one tomb, 4 in the other), while one of the 2 undisturbed MCIII/LCIA mass burials at Pendayia *Mandres* contained 4 maceheads, as well as 9 HTWs and 14 knives (Keswani 2004:Table 5.8; Karageorghis 1965). A particularly intriguing example is an ivory macehead in the collections of the Cyprus Museum, of the same form and size as the stone examples, that was reportedly recovered in the Agios Sozomenos region.[8] Interestingly, after the LCI the polished stone macehead completely vanishes from

[8] Accession no. 1948/VIII-11/1, turned in by a local but reported to have come from the vicinity of *Dhrakontospilios*, a large cave in the cliffs just west of *Kafkallia* and not far from *Glykia Vrysi*.

the mortuary record on Cyprus, seemingly coinciding with the abandonment of the MCIII-LCI fortresses.

These objects, as well as the high numbers of copper and bronze weapons found in MCIII tombs, although decreasing through the LCI and beyond, possessed the capacity for more forceful modes of negotiating social relationships than simple posturing for prestige through the display and practice of mortuary ritual. Even within the context of display, the significance of the obvious association between the symbols these agents have chosen and acts of violence should not be discounted. Visual and material referents to warfare communicate a complex suite of messages that would have been received and interpreted differentially by people of different identities in different contexts, belying a simple attributed significance of "status." Coercion occurs not just through the enactment of violence, but through the reminder of its potential.

Fortresses and Fortifications

The most incontrovertible evidence for warfare at the end of the Middle Bronze Age on Cyprus is the construction of extensive fortifications. The presence of fortifications associated with settlements, and even more so the isolated and apparently purpose-built fortresses, reveal a society in which the threat of violence had become so powerful that communities responded by altering the very way they lived, the way they built, and the way they interacted with the landscape. Fortin (1981) identified 22 fortresses on Cyprus that have been traditionally dated to the

MCIII-LCI period, although only four had been excavated prior to the present research. The other 18 sites were known only through unsystematic survey and some recording of visible architecture. Generally, sites are identified as fortresses or fortifications by the presence of defensive features, especially unusually thick walls, defensive architectural elaborations such as gates or towers, and strategically beneficial topographical placement. This definition, however, remains broadly applied, effectively amounting to a "pornographic definition" of a fortress: you know it when you see it. For the moment, this definition will suffice and the historic identifications of fortified sites accepted, but Chapters 6 and 7 systematically assess the defensive and coercive features of the structures called "fortresses."

There are several defensive strategies that people who are engaged in frequent warfare may adopt, including nucleation into larger sites, aggregation of sites into defensive clusters, the construction of inaccessible refuges, establishment of buffer zones between antagonistic groups, or the redesign of settlements with internal dividing walls or labyrinthine layouts to make the settlement harder to attack (Peregrine 1993; Roscoe 2008). All of these strategies are potentially costly, as, of course, is the construction of dedicated defensive structures: fortifications. Extensive comparative ethnographic studies show that fortification is a strategy only adopted by small-scale non-state societies in situations where the frequency of armed conflict is greater than once a year (Otterbein 1970). It is generally ill-advised to assume rationality in human behavior, but the consistency with which this pattern is observed suggests a pragmatic societal "cost-benefit" analysis: fortification requires a large investment in labor, resources, and collective engagement (Solometo 2004; 2006), and as a result, changes in fortification or other expensive defensive settlement patterns are a reliable indicator of change in the type, frequency, and scale of inter-group violence (Arkush and Allen 2006:7).

As with all matters concerning the Middle to Late Bronze Age transition on Cyprus, uncertainty surrounding the dating of the fortifications likely contributes to the underestimation of their significance. First, despite the recorded presence of chronologically earlier and later ceramic wares at some fortresses,[9] the fortresses as a group have historically been assigned to the MCIII-LCI (1700-1450 BC) (e.g. Catling 1962:19; Fortin 1981; 1983). Robert Merrillees (1971; 1994) revised the date for their inception further downwards into the LCIA, a proposal supported by Peltenburg (2008:152-153), reducing the fortresses' proposed lifespan to at most 150 years. These dating woes are compounded by research that tends to discuss the fortresses as a singular phenomenon (e.g. Merrillees 1982:375; Peltenburg 1996; 2008; Keswani and Knapp 2003; Knapp 2008:144–151). In these studies, all the fortresses are assumed to be contemporaneous, based on the minimal chronological data available, but the fortresses are also assumed to have all served the same function, despite significant variation in the size, form, and location of the sites.

[9] For example, Hector Catling recorded Red Polished III, a ware better associated with the MCI and MCII, as prevalent at the fortress at Dhali *Kafkallia*, and White Slip I, an LCII ware at Ayios Sozomenos *Nikolidhes* (Catling 1962: 161, no. 40; idem 1975: 197). The fieldwork completed as part of the current project reaffirms this problem, demonstrating that the fortresses, at least those in the region of the case study, are not fully contemporaneous.

The perceived homogeneity of Cypriot fortifications combined with the seeming reluctance to seriously discuss intercommunal violence in the Cypriot Bronze Age has produced a relatively unchallenged theory of Cypriot fortresses (cf Crewe 2007:65-66) as components within an emerging settlement hierarchy dedicated to the intensification of mining, transport, refining and export of copper, all of which was organized by and preferentially benefited the emergent elites residing at the newly founded coastal settlement of Enkomi (Peltenberg 1996) and possibly *Toumba tou Skourou* (Keswani and Knapp 2003:219). The models of the last 30 years that limit the fortresses' capacities to operating as components of a security system for the copper trade, combined with the perceived brevity of their construction and use, dismiss Cypriot Bronze Age fortresses as merely epiphenomenal to the island's political economy, a failed experiment during a quickly forgotten transitional period.

Most other scholarly discussion of the Cypriot Bronze Age fortresses has been limited to attempts to discover architectural parallels with contemporary fortified sites in the Levant, Anatolia, or the Aegean, or on occasion to argue instead for their local inspiration (Sjöqvist 1940; Merrillees 1971; Fortin 1981; 1983; Merrillees 1994; Peltenburg 2008). The fortresses also frequently illustrate the sweeping narratives of culture history, less in vogue in recent years. These stories were more descriptive than explanatory, relating the fortifications to the expulsion of the Hyksos, the Canaanite rulers of the 15th Dynasty, from Egypt, or to military incursions from the Levant in search of Cyprus' metal wealth (e.g. Fortin 1981;

Baurain 1984; Hult 1992). However, serious evidence for the presence of Levantine invaders on Cyprus is lacking, and any chronological relation between the end of the Second Intermediate Period and the construction of the fortresses is more likely to be a testament to the general violence and political unrest of this timeframe all around the eastern Mediterranean. Most recently, in her reassessment of the earliest evidence from the LC center at Enkomi, Lindy Crewe (2007:65-66) presents ceramic evidence to support the notion that the excavated fortresses were not centrally controlled, and argues for the construction of all the forts as "regional responses to both internal and external pressures, concomitant with a greater scale of community interaction." In this, she is certainly correct, although she does not explore the ramifications of this conclusion for understanding the social and political developments during this period.

The designation of some of the 22 aforementioned sites as fortresses has also fallen out of favor with scholars in recent years. Andrea Rowe (1995) completed a partial resurvey of the Ayios Sozomenos region in 1993 reinterpreted the three large fortified enclosures atop the plateau as animal pens, a notion repeated more recently in other publications (Devillers et al. 2004; Devillers 2008). This reclassification is problematic, as will be demonstrated extensively in Chapters 5 and 6, as it disregards several known architectural features that would argue against such the new interpretation, not the least of which is the presence of extensive internal architecture at one site, and massive walls and strategic locations at all three. In a rare attempt at theorizing the fortifications, and in contrast to his own earlier position, Knapp has more recently proposed that the Cypriot fortresses should be understood as the opening salvo in the "trend of 'place-making' by emergent elites that would culminate in the monumental ashlar buildings of the LCII-III," and he argues that the indigenous elites built the forts to "control people's movements and interactions by appropriating, enclosing, and monumentalizing space" (2013:360). This is a valuable perspective, but it still manages to sidestep the role that fortresses play in warfare. It also reads a specific intention into the actions of the invisible "elite," rather than considering the active and generative roles that the fortresses played as material components of a new social assemblage and the agency and interactions of non-elite actors.

Settlement fortification in the MCIII has also not received much attention, but there is growing evidence that this practice may not have been uncommon. Dhali *Kafkallia* is included in the list of 22 fortresses, and contains a 3 ha. MCIII village surrounded by a substantial fortification wall (Overbeck and Swiny 1972:28), and therefore should be regarded as a fortified settlement, and Michel Fortin (1981) suspected that several of the unexcavated enclosures in the north might encompass settlements of varying sizes. The ECIII-LCI settlement at Erimi *Laonin tou Pourakou*, located atop a high hill in the Kouris valley on the south coast has a two potential circuit walls, referred to in the literature as terrace walls, one encircling and separating the workshops in Area A at the crest of the hill from the settlement on the lower terrace, which is also enclosed (Bombardieri 2017:350–351, Figure 16.2). Åström believed that the massive wall (>1.5 m thick) in Trench 3 at Kalopsidha might be a fortification, but Crewe speculates that this monumental construction "represent[s] a social strategy of emulation of Levantine elite behavior rather than possessing a purely militaristic function" (2010:65). However, she also observes that the size and construction techniques of that wall are comparable to the walls of the sites classified as fortresses, including the Level A and IA fortresses at Enkomi (Dikaios 1969:15–16), the structure atop the mound at Phlamoudi *Vounari* (Horowitz 2007: 140-141; Table 6.6), and at Korovia *Nitovikla* (Sjökvist 1940:64-73) and Ayios Sozomenos *Glyka Vrysi* (Gjerstad 1926:34-47). There was also one massive wall (~2m thick) discovered in her own excavations at the Middle Cypriot site at Kissonerga *Skalia* (Crewe et al. 2008), although Crewe is certainly correct that the wall at *Skalia* is not in an intuitively defensive location or shape, as it follows a bizarrely serpentine course before stopping abruptly, without apparently encircling much of the settlement.

If Crewe's reading is correct, the speed at which this emulation of Levantine elite behavior spread across the entire island is remarkable, and the necessary scale of investment in energy and resources begs the question of whether status emulation is a sufficient explanation as sole or even prime motivator. The explanation of foreign emulation is being used to write-off the more violent implications of multiple strands of evidence, including fortifications and weapons. Additionally, the monumental walls of the Levant that Cypriot leaders were supposedly emulating were distinctly military in purpose. Like the weapons discovered in Cypriot Bronze Age burials, if fortifications were simply emulation of foreign elite practice, why were the practices chosen for emulation conceptually, and most likely functionally as well, directed towards concerns of violence, defense, and coercion?

Another source of corroborating evidence for the role of Cypriot fortifications in armed conflict is provided by the few fortifications that were previously partially or fully excavated, all four of which demonstrate repeated episodes of destruction and reconstruction. When Dikaios excavated the blockhouse-type Fortress at Enkomi, he concluded that both Level IA (dated to LCIA by Crewe [2007: Table 11.1]) and Level IB (ending in early LCIIA) ended in massive destructions, evinced by thick layers of mud brick collapse, rubble piles, and some evidence for burning (Dikaios 1969:21). However, Crewe questioned this analysis, arguing that the damage Dikaios reports to the northern wall actually suggests intentional dismantling, and that evidence for localized burning only indicates, "minor disasters and rebuilding episodes" (2007:77). It remains unclear what constitutes a "minor disaster," but the continued minimization of violence is apparent. Ayios Sozomenos *Glyka Vrysis* is also a blockhouse-type structure, this time in the central Mesaoria. A sounding below the floor of the fortress found large quantities of MCIII ceramics, but a single intrusive sherd led Gjerstad to assign the initial construction of the blockhouse to the LCI. He reports that the fortress was "violently destroyed by an enemy's hand: the ramparts and walls were partly demolished and fire was applied," and inner walls were completely smashed, but the building was rapidly rebuilt and remained intact following its abandonment (1926:42-46).

Korovia *Nitovikla*, on the eastern Karpas peninsula, is a complex site consisting of a sequence of outer fortifications atop a plateau right on the sea, with a large square courtyard building that strongly resembles a medieval blockhouse castle or the contemporary structure at Tell Burak (Peltenburg 2008). No less than five different scholars have offered up their interpretation of the stratigraphic sequence at this site. The original excavator, Erik Sjökvist (Gjerstad, Sjöqvist, and Westholm 1934:393–407) identified three occupation periods at the site, one before the fortress was built (early MCIII), and a First (late MCIII) and Second (LCI) Fortress, each of which was destroyed with entire walls pulled down. In the SCE volume on the Middle Cypriot Bronze Age, Åström interprets the main fort building and surrounding enclosure as a "war-time refuge," occupied and renovated into the LCIA (SCE IV:1B:4). In the Late Cypriot Bronze Age volume, he calls the destruction of the first fortress a "catastrophe," followed by reconstruction in the LCIB, with a final LCII violent demise (SCE IV:1C:34).

The fortified nature of the structures built during successive construction phases at Phlamoudi *Vounari* also remains debated. More ambiguous than the heavily walled blockhouses at Enkomi or *Glyka Vrysi*, or the large enclosures at *Nitovikla* or *Kafkallia*, Vounari has been alternatively interpreted as an isolated fort (Fortin 1981), a rural sanctuary (Al-Radi 1983), and a monumental enclosure (Horowitz 2008). But like the other excavated fortresses, *Vounari* appears to have suffered a sequence of destructions and reconstructions, in LCIA, LCIB, and a final destruction in the LCIIA. As with the other sites, a recent reinterpretation by Mara Horowitz (2007; 2008) of these destructions casts them as intentional dismantling or geomorphological collapse preceding remodeling. In addition to these sites, Chapter 5 presents evidence that Agios Sozomenos *Nikolidhes* has at least one episode of reconstruction, though it is unknown whether this follow intentional or violent destruction.

Despite the recent efforts of scholars to eliminate, or at least downplay, violence in the interpretation of these structures, the weight of evidence suggests that these sites were the target of repeated attacks, resulting in multiple episodes of destruction and rebuilding. Stone and mudbrick construction is not easily susceptible to burning, although the presence of combustible materials (oil or grain) can cause wood posts and roofs to burn, which in turn can lead to wall collapse (Kreimerman and Shahack-Gross 2018:2925). Accidental fires are certainly possible, but are more likely to begin from the roof, which may point to burning projectiles used in attack. The frequent remodeling of large, heavily built walls indicates a defensive response to these violent destructions, which would not be expected if the destructions had been accidental. The frequency with which buildings throughout the Middle Cypriot Bronze Age burn, collapse, and are reconstructed thus paints a picture of increasing violence, while the remodeling of defensive structures suggests experimentation with different architectural responses. Although earlier settlement destructions appear to be followed by immediate abandonment, the massive LCI structures were frequently rebuilt, perhaps because the strategy of fortification had proven effective and the need for defense has not passed, or because the people of the Bronze Age were just as susceptible to the fallacy of sunk costs as the people of today.

Dimensions of Middle Cypriot Bronze Age War

Arkush and Stanish state, "Archaeologists have been too quick to dismiss warfare as a valid explanation for the empirical patterns seen in the archaeological record" (2005:5), and this appears to be the case for the Bronze Age on Cyprus. This has been demonstrated in the past two chapters, and the defensive role of the fortresses will be further discussed in Chapters 6 and 7, further supporting this argument. But beyond its explanatory value, why should we concern ourselves with prehistoric conflict? Prehistoric warfare is tremendously variable in scale, practice, and effect, and it "has not been conceptualized as a historical phenomenon with its social connections, causes, and consequences" (Vencl 1984:118). Warfare among non-centralized societies is frequently characterized as "just raiding," which depicts conflict as a minor inconvenience, limited in scale and fatalities, with little lasting societal impact (Solometo 2006:24), and yet many models of social evolution rely on armed conflict in prehistory as a key facilitator (Carneiro 1970; Earle 1997; Ferguson 1984; Haas 2001; Redmond 1994).

Recent archaeological studies, including this one, therefore strive to examine the ways in which warfare and societies shape each other. Variability in war relates to variability in consequence – chronic warfare does not always lead to increased social complexity – but war doubtlessly effects society and its agents, and as a social practice may effect social change. However, as a complex and variable practice interacting with other social factors, it also has unintended effects. A first step in understanding the social consequences of war is attempting to characterize the conflict. Here I return to the useful rubric produced by Julie Solometo (2006) and presented briefly in Chapter 3 and summarized in Table 3.1. This rubric allows the characterization of the conduct of war along several inter-related dimensions that aid in exploring the relationship between the conduct of war and the consequences that may be detected in the archaeological record. I first present the dimensions of war here in more detail, and then apply them to the data from Bronze Age Cyprus.

Social Distance – "War is a social activity carried out by groups against other groups" (Solometo 2006:26) and social distance is a measurement of the relationship between these groups, measured by the number and nature of kinship ties, perceptions of group identity, trade partnerships, and other beneficial relationships. Strong and frequent relations can lead to increased friction, but also serves to prevent or limit conflict, as group members are less likely to risk lives, profits, or other benefits of the relationships (Kock 1974; Meggitt 1977). Increased social distance results in fewer shared interests, and therefore fewer reasons to refrain from conflict and fewer opportunities to achieve peace.

Another factor not considered by Solometo but clearly related to the concept of social distance may be the development of "a social calculus based on a notion of social substitutability" (Parkinson and Duffy 2007:100; citing Kelly 2000). Social substitutability is a cultural logic that equates, and thus allows the substitution, of an individual for group of which they are a member. When associated with social segmentation, this social substation encourages raiding and revenge, (Marcus 2008) while social segments becomes institutionalized through ties to the landscape, such as fortresses (Parkinson and Duffy 2007).

Social Scale – This dimension measures the size of the groups involved in conflict. Small parties rely on secrecy and stealth. Conflicts that rely on major offensive events and the adoption of defensive strategies require larger numbers of participants in combat, so recruitment through the building of alliances becomes important.

Tactics and goals– The tactics used in warfare, including the size of the attacking party, the types of weapons used, and the types of targets chosen are all influenced by social distance. Related communities are likely to avoid unnecessary fatalities, especially among non-combatants like women and children, and to minimize property and resource destruction. Conflict motivated by the goals of prestige acquisition or in search of redress for perceived wrongs, such as theft, argument, debt, or property or sexual disputes occurs among related groups (Meggitt 1977; Sillitoe 1978). Small scale raiding for prestige goods, livestock or women may also occur within closely related groups. This type of conflict often occurs away from settlements, or as surprise raids or ambushes.

In contrast, the absence of ties between groups results in dehumanization of the enemy, and therefore trophy-taking, and maximizing deaths and the destruction of settlements and resources. These conflicts involve large war parties, use of deadly weapons, the deaths of non-combatants, and settlement destructions. These tactics also correlate with the social logic of substitution, where the group or segment and the individual are interchangeable.

Frequency and predictability – When war is infrequent and unpredictable, societies do not expend energy on the adoption of defensive strategies. Fortifications are a reliable indicator of frequent and predictable attack, although the inverse is not always true – societies subject to frequent attack may adopt other defensive strategies than fortification, including the construction of inaccessible refuges or the adoption of mobile settlement and subsistence strategies.

Duration – Individual attacks or raids are typically brief. Small-scale non-centralized societies lack the resources necessary for siege warfare. Sieges may also be prevented by communication with allies, so intervisibilty among settlements will discourage this activity. Conflict between related groups is likely to cycle between peace and war, while distant groups lacking the motivation or mechanisms for peaceful settlement may be caught in a state of perpetual war.

In the earlier phases of the Bronze Age on Cyprus, villages were small – certainly too small to be endogamous, so intermarriage between communities must have been frequent. Infilling of the landscape also would have brought communities into more frequent contact as the distance between settlements decreased, providing increased opportunities for inter-communal gatherings, and the formation of trade alliances and social storage, all suggesting low social distance at least between neighboring groups. The small size of Cypriot villages in the early Bronze Age also suggests a small social scale, but both social scale and distance increased as the Bronze Age progressed and population increased. Settlements grew larger, and while alliances with immediate neighbors may have been strong, this could have actually increased social distances between settlements where the physical distance remained the same, as increased population resulted in less requirement for social interactions between groups.

This aligns with the evidence for tactics and goals of Cypriot MBA internecine violence. Metal (particularly weapons), women, and animals were likely sources of prestige sought after in these small-scale intermittent conflicts. Weapons, and particularly maces, which are high-fatality interpersonal weapons, occur more frequently in tombs and settlements as the EC and MC progress. There is little evidence for settlement destruction in EC Cyprus, but by the MCII settlement destruction appears to have become a frequent occurrence, also supported by the large-scale abandonment and relocation of settlements evinced by survey data. Small-scale raiding would explain the lack of settlement destruction during the EC, but a change in tactics that increased the rate of destruction of settlements in the MC would also indicate a change in the scale and goals of the conflict. Also pointing to more lethal tactics and goals at the end of the Middle Bronze Age is the mortuary evidence, in the form of skeletal trauma and mass burial. Osterholtz's sample from the Kalavasos Valley, where 9% of the individuals had evidence for the type of injury to the skull that is expected from interpersonal violence, all dated to ECIII-MCII. Unfortunately, there is no evidence from the preceding or following periods to compare this to, but it suggests that at least by this period in the Bronze Age intergroup violence had progressed beyond mere raiding to the use of lethal force with some frequency. Larger scale attacks that included taking women or children captive, killing defenders, and destroying buildings and stores of staple goods, would deal significant damage to a group's viability. This in turn would provide opportunities for other groups to expand and seize access to contested resources.

Similarly, the construction of fortifications at the end of the Middle Bronze Age is evidence that warfare had become sufficiently frequent, predictable, and costly that some groups were now choosing to adopt expensive defensive strategies to protect their settlements. Discussed further in Chapter 6, the size and form of some fortresses, which lead some scholars to call them animal enclosures, may also point to a contested source of wealth - namely livestock. Although Early Bronze Age settlements on Cyprus are agro-pastoral villages, prior to the fortresses there is no evidence for livestock herds of the scale that might require 4 ha. fortified enclosures. The adoption of these structures, especially suited to pastoral uses and protection, may also indicate changing subsistence strategies to adjust to the economic pressures of endemic warfare, as mobile herds would be easier to protect from attack than crops in fields.

In conclusion, on Cyprus, the Bronze Age fortifications provide the strongest evidence for a society at war, but they are far from the only evidence. Increased weaponry, settlement destructions, skeletal trauma, and shifting settlement patterns, also indicate that violence, and not just interpersonal violence but intercommunal conflict, was a growing concern throughout the Bronze Age. The tactics of the conflict also appear to have changed over time. Cypriot society earlier in the Bronze Age was characterized by a smaller scale and closer social distances, so infrequent or cyclical raiding for women, livestock or prestige goods is the most likely pattern of conflict. With population growth, competition over restricted resources like copper and reliable farmland, and the potential for greater social distances between communities as the Bronze Age progressed, the intensity and frequency of violence increased. Growing emphasis on warrior status, and the targeting of settlements and resources for destruction also indicates increased societal segmentation and social distance. By the end of the Middle Bronze Age, large scale population movements and the construction of fortifications specifically point to an increase in the frequency, intensity, and predictability of attack.

The fortresses are thus a key source of evidence for social practice during this phase. Unfortunately, the 1974 Turkish invasion and subsequent division of the island halted archaeological research on these sites, the majority of which remain inaccessible. This lack of data has hampered theorization of the role these fortresses played in Cypriot society, and has potentially limited scholarly attention to, or even acknowledgement of, evidence for the increasing internecine violence on Cyprus during the Bronze Age. The research undertaken on the fortresses and settlements in the Ayios Sozomenos region as part of this project begins to address these oversights and to fill a gap in our understanding of the role architecture and material culture play in the turn of small-scale societies towards complexity. The next chapter will introduce the Agios Sozomenos case study and the results of recent fieldwork at the fortresses and settlements in the region, as well as previously published comparanda from sites excavated in the north prior to 1974. These data will be used in the analyses that follow in Chapters 5 and 6, to explore how the fortresses generated their defensive and disciplinary efficacy through their architecture and relationships with bodies, materials, and features in the landscape.

Chapter 5:

INVESTIGATIONS AT AGIOS SOZOMENOS: METHODS, SITE DESCRIPTIONS AND COMPARANDA

As demonstrated in the preceding chapter, the construction of fortifications[1] is the strongest and most conspicuous evidence for the escalation of violence at the end of the Middle Bronze Age in Cyprus. However, the "fortress" is not a stable architectural category. As many as 22 Cypriot MC-LCI fortresses have been recorded (Table 5.1) but their classification is not universally agreed on, and recent excavations of settlements from this period suggest that the construction of massive enclosure walls may be even more widespread than previously thought.[2] Of these previously recorded fortified sites, 13 are located in the northern third of the island, on both sides of the spine of the Kyrenia mountain range that runs east-west across the island and out onto the Karpas Peninsula. The remaining nine fortresses occur in three distinct clusters in the central Mesaoria Plain, south and east of the modern

[1] It is impossible to eliminate all confusion with these terms, but I attempt to use *fortress* as a catch-all for this category, such as it is, of sites. A *fort* is a free-, or mostly free-standing individual building, like a blockhouse, courtyard building, or complex bastion or tower structure. An *enclosure*, or *enceinte*, is a large wall surrounding a mostly un-roofed area. A *fortification* or the associated verb, *fortify*, refers to the possession of architectural features associated with defensibility, such as enclosures, ditches, towers, or limited access in the landscape.

[2] The site at Erimi has a large wall encircling the site that was discussed in Chapter 4. Kissonerga *Skalia*, in the southwest of the island, also has a massive wall, dated to LCI, but instead of encircling the site, it takes an inexplicable serpentine route through its center.

Region/ Cluster	Site	Dimensions (m)	Features	Type
Geri Plateau	Geri *Vrysi ti Pantelous*	60 x 90	empty	Enclosure
	Geri *Phthelia*	4 x 7	single structure	Tower
Agios Sozomenos Plateau	Dhali *Khafkallia*	150 x 200, 200 x 400	tower, internal architecture	Fortified Settlement
	AySz *Nikolidhes*	250 x 250	internal architecture, tower	Enclosure
	AySz *Barsak*	250 x 200	double wall and ditch, empty	Enclosure
	AgSz *Glykia Vrysi*	31 x 14	single structure, courtyard	Fort
Aglantzia (Elenja)	Aglantzia *Leondari Vouno*	60 x 40	prominent hill	Enclosure
	Aglantzia *Kafezin*	32 x 41	internal architecture	Fort
	Aglantzia *Nifkia*	20 x 15	Empty	Tower
Kormakiti Plateau	Asomatos *Potemata*	100 x 300	tower, internal architecture	Fortified Settlement
	Karpasa *Styllomenos*	100 x 100	empty	Enclosure
Kyrenia Pass	Dhikomo *Onisia*	80 x 80	empty	Enclosure
	Dhikomo *Pamboulos*	300 x 200	internal architecture	Fortified Settlement
	Krini *Merra*	150 x 80	double wall, bastions	Enclosure
	Bellapais *Kapa Kaya*	100 x 100	internal architecture	Fortified Settlement
Karpas Peninsula	Phlamoudhi *Vounari*	18 x 18	artificial hill, small enclosure	Tower
	Lythangomi *Troullia*	130 x 60	orthostat wall, ditch	Enclosure
	Korovia *Nitovikla*	400 x 200 35 x 40	fort, towers, internal architecture	Fortified Settlement
	Dhavlos *Pyrgos*	?	orthostat slabs, hill	Tower?
	Ayios Thyrsos *Vikla*	50 x 50	prominent hill	Fort?
	Rizokarpaso *Skylla*	150 x 120	prominent hill	Enclosure
Enkomi	Area III Fortress	45 x 13	single structure, courtyard	Fort

Table 5.1 – Summary of Known or Suspected Fortified Sites, based on Fortin (1981). Sites outside Agios Sozomenos were updated when possible with observations from GoogleEarth satellite imagery.

capital city of Nicosia. The southernmost of these three clusters is in the region surrounding the village of Agios Sozomenos (Figure 5.1).

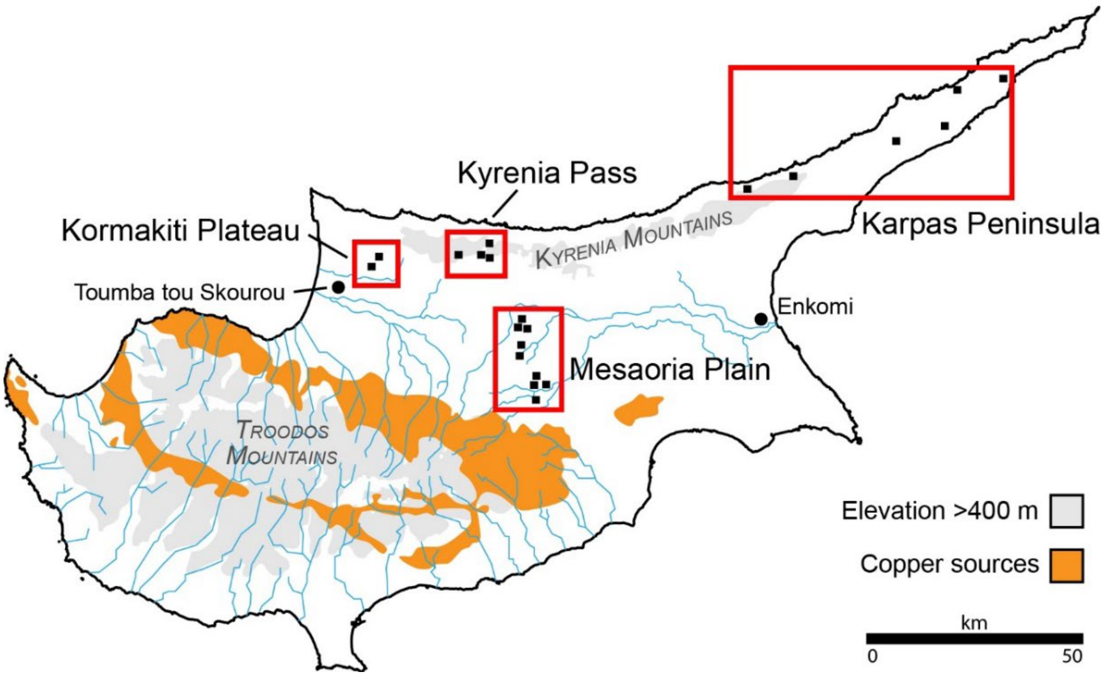


Figure 5.1 – *Map of Cyprus with Regions/Clusters of fortresses marked. The clusters in the Mesaoria from North to South are Aglantzia (formerly Elenja), Geri, and Agios Sozomenos.*

Acquiring an appropriate dataset for an inquiry into the development and interactions of a cluster of fortresses has not been possible until very recently. Due to the partitioning of the island following the 1974 Turkish invasion, none of these sites were accessible to archaeological research. Research on sites that are in the occupied north would be a violation of both Cypriot law and the UNESCO Convention for the Protection of Cultural Property in the Event of Armed

Conflict.[3] The remaining 8 sites, located in the central Mesaoria Plain, are all either in or directly adjacent to the UN-established "Buffer Zone,"[4] a no-man's land buffer zone between the territory controlled by the Republic of Cyprus and that occupied by the Turkish military. In the decades following the war, some areas adjacent to the Green Zone were heavily militarized by Cypriot, Turkish, or UN forces, further restricting access to these sites.

The relaxing of military tensions between the self-declared Turkish Republic of Northern Cyprus and the Republic of Cyprus in recent years and the completion of UN landmine removal projects has again allowed access to the Agios Sozomenos region, providing the opportunity for renewed investigations into the most southerly of the known clusters of fortifications. This cluster consists of three large enclosures at Dhali *Kafkallia*, Agios Sozomenos *Barsak*, and Agios Sozomenos *Nikolidhes*, and the blockhouse fort at Agios Sozomenos *Glykia Vrysi*. I completed the fieldwork for this dissertation at these and surrounding contemporaneous sites in the region between 2013 and 2016, in collaboration with Dr. Despina Pilides and the Agios Sozomenos Excavation and Survey Project of the Cyprus Department of

[3] The Hague, May 14th, 1954. Second Protocol, The Hague, March 26th, 1999.

[4] Also sometimes referred to as the "Green Line." because Major-General Peter Young of the British peace force drew the ceasefire line on a map with a green pen (Calame and Charlesworth 2011:133). I was told anecdotally by a Cypriot colleague that the Buffer Zone varies in width because of the small scale of the map and the variable pressure of the original writing instrument. Whether this is true or not, it is a fascinating demonstration of both the unintended political force of objects and the imagined political landscape.

Antiquities. The location of the study region is marked in Figure 5.2. Pilides and ASESP have continued to work at some of these sites in subsequent years, and I include discussion of their most recent results, as already published (Pilides 2017a; Pilides 2017b; Pilides 2018a; Pilides 2018b).

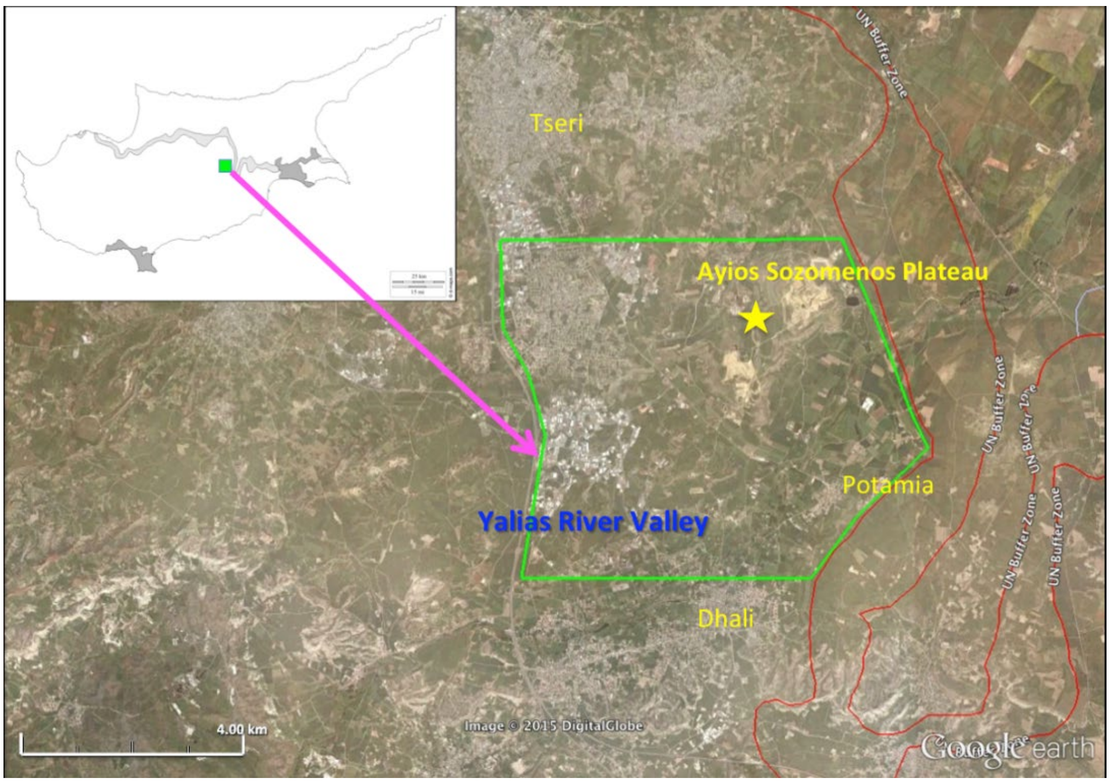


Figure 5.2 - *Location of the Agios Sozomenos study area (green), adjacent to the UN Buffer Zone (in red)*

Little is known about most of the other fortifications from this period, as prior to 1974 only four of the fortress sites had been excavated. One of these was Agios Sozomenos *Glykia Vrysis*, and the other three (the blockhouse fortress in Area III at Enkomi, the enigmatic platform at Phlamoudhi *Vounari*, and the major installation and enclosure at Korovia *Nitovikla*), provide vital comparanda for my analyses. This chapter provides a brief overview of the Agios Sozomenos region and the history of research in the area (see also Pilides 2017a:97–100), and then describes the research methods employed in this project. The chapter closes with brief descriptions of the sites that are key to this research: the 4 fortresses of the Agios Sozomenos region and the 3 fortresses in the northeast excavated before 1974.

Topography and Resources

The Agios Sozomenos study region covers an area of roughly 25 km^2 in the geographic center of Cyprus. It consists of the catchment of the Yialias River as it exits the foothills of the Troodos mountains and is joined by the Alykos River, before crossing the Mesaoria plain. The modern village of Agios Sozomenos, abandoned during the intercommunal violence that followed Cypriot independence in 1963, lies just west of this confluence, at the foot of a large marine sandstone plateau that dominates the local landscape. The plateau can reach over 40 meters above the surrounding terrain, and the cliffs, near-vertical in places, greatly limit passage from the Yialias River valley floor to the top of the plateau (Figure 5.3). Today, as in the past, the only readily traversable routes between valley and plateau are a rock-cut trail behind the modern village, the drainage of *Glykia Vrysi* in the south, or via the gentler slopes on the far side of the plateau in the north and west.

The river valleys of the Alykos and Yialias are broad, with gently sloping alluvial terraces that are primarily used today as agricultural land, and that also serve as communication routes: southwest up the Yialias into the copper-bearing foothills

Figure 5.3 - *View of the Barsak promontory of the Agios Sozomenos plateau, from atop the Nikolidhes promontory. The abandoned modern village lies between.*

near Alambra and Mathiatis and west up the Alykos towards Marki or north to Nicosia and the Kyrenia Pass. Where the two rivers converge near the village of Agios Sozomenos, they form a wide and fertile alluvial plain; the enriched Yialias River then continues eastwards across the Mesaoria towards the sea and the site of the Late Cypriot harbor town at Enkomi. Agios Sozomenos is also situated just a few kilometers to the east of the A1, the present-day multi-lane North/South highway. This route, however, was not the traditional preferred route from Larnaca Bay to the capital of Nicosia, and onwards to the north coast. Prior to the regrettable partitioning of the island following the 1974 invasion, and the resultant UN-established Buffer Zone, the main route between Larnaca and Nicosia passed immediately east of the Agios Sozomenos plateau. These modern north-south land-routes and the east-west corridors of the Alykos and Yialias rivers immediately demonstrate the diachronic potential of this region as a crossroads of trade routes.

The confluence of the rivers ensure that this region is exceptionally well-watered, but in addition to the rivers, the territory surrounding Agios Sozomenos is dotted with modern and ancient wells, and perennial springs, notably including two that originated atop the plateau close to the Bronze Age enclosures (Figure 5.4). Although the courses of these two streams are now almost completely destroyed by modern sand mines, evidence for their presence can still be seen in the construction of water reservoirs, the occasional flooding of the sand quarries, and the presence of lush greenery even in high summer. The river valley, particularly the level floodplain between the two rivers, is highly sought after agricultural land and the plateau is still grazed by sheep and goat herds. The plateau itself is a ready source for building stone[5] and there are several locations around the perimeter of the plateau with evidence for ancient quarrying.

Of course, no discussion of Bronze Age settlement in Cyprus is complete without consideration of access to copper resources, located in the cuperiferous

[5] Much of the plateau is fairly porous marine sandstone, made from a conglomerate of large grains of quartz and limestone from the ancient sea bed. The main industrial activity today on the plateau is the large-scale extraction of this stone, which is then ground into sand for use in concrete.

band of pillow-lavas that surround the Troodos Massif, where the calcareous soils that cover most of the island meet the volcanic soils of the mountain upthrust. The Agios Sozomenos region is well-situated with regards to known copper sources in

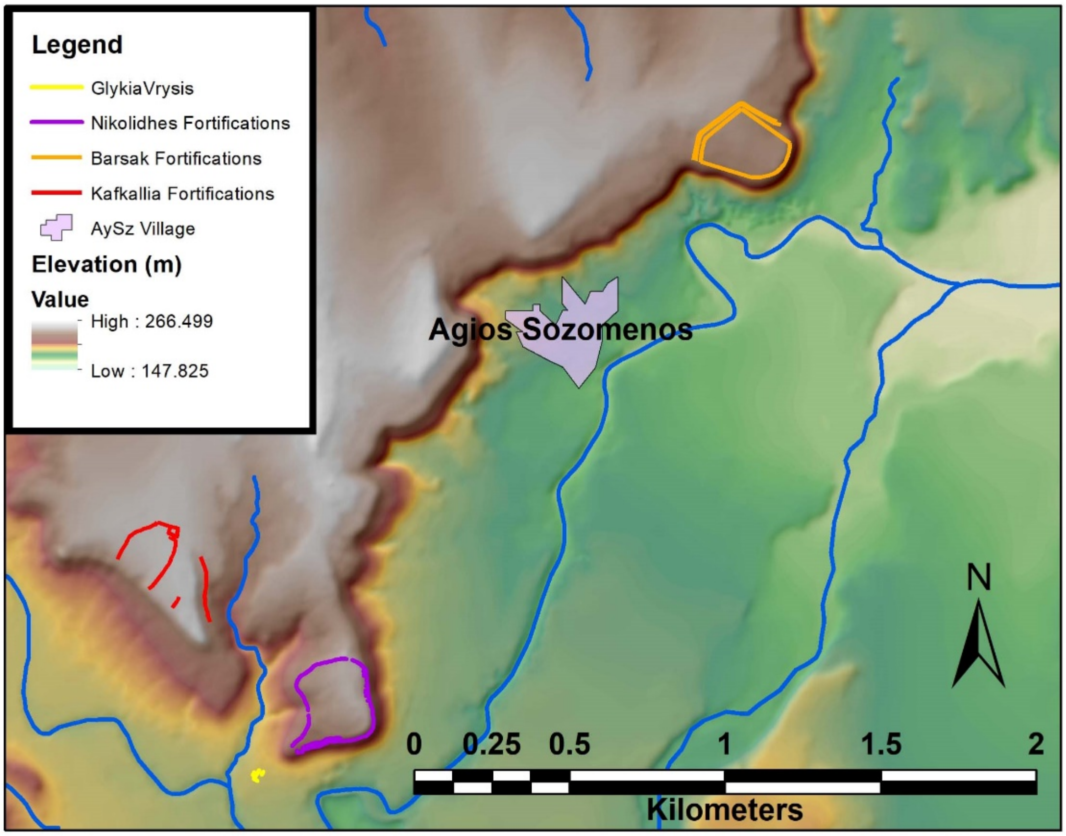


Figure 5.4 - *Map of Agios Sozomenos Plateau, with the Yialias River (north) and Alykos River (south) highlighted, and historical tributaries now destroyed by development. (DEM courtesy of Zomenia Zomeni, Cyprus Geological Survey).*

the pillow-lavas directly to the west, although the evidence for the exploitation of these sources during the period in question is inconclusive. The Sia-Mathiati copper ores are only 10 km away from Agios Sozomenos, but there is no evidence for mining during the Bronze Age in this region, as the earliest known mine in the area, Ayia Varvara *Almyras*, has only been dated to the Iron Age (Gale et al. 1996:400).

Agios Sozomenos has been somewhat protected from modern development by its proximity to the Buffer Zone, but in the last two decades, industrial sand mining operations on the plateau, the construction of water treatment facilities, and intensive agriculture and dairy farming have taken their toll on the local archaeological remains. Additionally, the location of the plateau immediately adjacent to the Buffer Zone has contributed to the heavy militarization of the region. Modern military activity has also had a detrimental effect to site conservation, but on the other hand, these activities dramatically demonstrate the continued economic, strategic and defensive importance of the plateau and the surrounding territory.

History of Research

Both archaeologists and looters have long recognized the Agios Sozomenos region as a focus of Bronze Age settlement (Catling 1982:227–236; Pilides 2017a). Max Ohnefalsch-Richter first excavated tombs in the region in 1894, and Einar Gjerstad excavated a blockhouse-type fort structure at Glykia Vrysi (at that time assigned the toponym *Nikolidhes*) in 1924 as part of his dissertation research preceding his involvement with the Swedish Cyprus Expedition from 1927-1934. At that time, he also noted the presence of an early Bronze Age settlement atop the hill with "foundations, built of unwrought stones, projecting above the thin earth-layer," almost certainly *Kafkallia*, and that the hill above Glykia Vrysi "is fortified by a defensive wall and surrounding forts," likely referring to the site now called

Nikolidhes (1926:6). In his description of the excavations at *Glykia Vrysi*, Gjerstad also comments that the blockhouse and the "fortifications on the hill north of the settlement" (aka *Nikolidhes*) are "a sort of military establishment and not a town," and that "it is worthwhile to mention the establishment of a similar military station 3 km northeast of *Nikolidhe*s [sic *Glykia Vrysi*], close to the village of Ajios [sic] Sozomenos" (1926:37). Here, he clearly refers to *Barsak*.

In 1953, Hector Catling first visited Agios Sozomenos as a PhD student, writing brief reports and delivering finds to the Department of Antiquities that remain unpublished. Catling returned to Agios Sozomenos in 1957, completing an intensive survey as part of the newly formed Cyprus Survey, in which he recorded most of the sites known today in the region (Catling 1962; 1982), including all three of the large enclosures atop the plateau. In 1972, Stuart Swiny and John Overbeck surveyed the region and found no new sites, but they mapped the fortified settlement at Dhali *Kafkallia* and excavated a partially looted tomb at the *Kafkallia* cemetery.

Michel Fortin completed a dissertation on Cypriot Bronze Age fortifications in 1981, the research for which included a trip to Agios Sozomenos accompanied by Stuart Swiny in 1975. This visit, however, was cut short by the military closure of the region. Andrea Rowe (1995) was the first archaeologist to work in Agios Sozomenos again following the 1974 invasion, undertaking a partial resurvey for her MA research in 1993. Although much of the region remained inaccessible to her due to continued military restrictions, she relocated several of the more westerly sites recorded by Catling. Her research was further complicated by incomplete or inaccurate recording of site locations and toponyms, resulting in confusion in subsequent publications. She also recorded nearly all the Red Polished ware she encountered in her survey and in the collections made by Catling as Red Polished IV, and as a result, she assigned most sites to the MCIII period. This is problematic due to the low number of diagnostic sherds that she or Catling recovered and the difficulty in identifying RP wares exclusively by fabric. Similarities between much of the Agios Sozomenos area Red Polished fabrics and forms, and the "Red Polished B" recovered in the 1974-1985 Cornell excavations at nearby Alambra *Mouttes*, suggests that much of this material could actually date to earlier phases of the Middle Cypriot (Coleman et al. 1996; Barlow 1991).

In 2012, Despina Pilides, under the auspices of the Cyprus Department of Antiquities, launched the Agios Sozomenos Excavations and Survey Project (ASESP), with the aim to enhance our understanding of the role and function of the center of the island during the Late Bronze Age through survey, excavation, and other research methods. The research that I completed from 2013-2016 was in cooperation with, or directly under the auspices of, ASESP. Since the completion of my fieldwork and museum study, ASESP has continued to excavate at the fortress of *Nikolidhes* and the settlement at *Ampelia,* but only the published results up to the 2018 season will be considered in my analyses (Pilides 2016; Pilides 2017b; Pilides 2017a; Pilides 2018b).

Methods and Data Collection

Mapping the Fortresses

In July 2013, in cooperation with ASESP, Matthew Spigelman and I completed a project at two of the fortified enclosures on the plateau: *Barsak* in the north and *Nikolidhes* in the south. The goals of this season were to record the architectural remains visible on the surface, to better understand the nature and condition of the sites and to assess prospects for future research. This work took ten days, and consisted of high resolution, detailed recording of the standing architecture at *Nikolidhes* (200m x 200m) and *Barsak* (230m x 230m) using a Trimble Total Station to take measurements every 1-2 meters (Figure 5.5), as well as photographic documentation of architectural features, including spur walls, orthostats, quarrying and other cuts in the bedrock. An RTK GPS was used to record control points at both sites to allow integration of the Total Station data with map data from the Republic of Cyprus Department of Maps and Surveys and the Cyprus Geological Survey, and to document the location of modern military trenches. At *Kafkallia*, the third fortification on the Ayios Sozomenos plateau, we established control points with the high-accuracy RTK GPS, that later facilitated the georectification of aerial photographs and archaeological plans from Overbeck and Swiny's 1972 mapping project with the survey GIS. This became the pilot season for this dissertation.

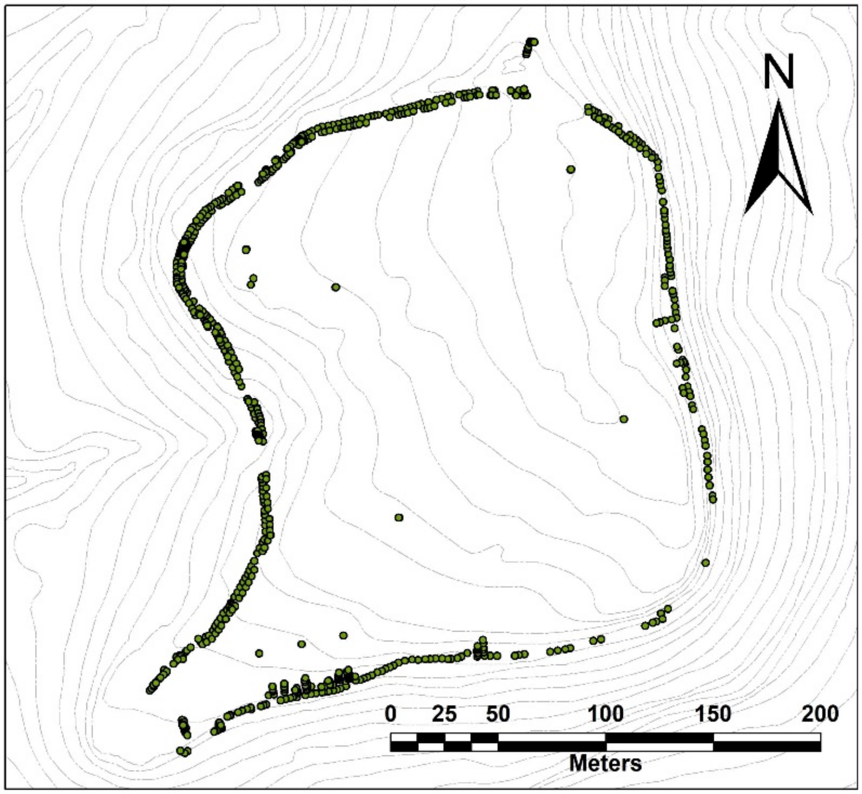


Figure 5.5 - *Visualization of raw data from 2013 mapping season at Nikolidhes*

Aerial and Satellite data

Historical satellite imagery available through GoogleEarth, high resolution multi-spectral satellite data,[6] and black and white aerial photographs collected by the RAF in 1963 and 1993 were integrated in the project GIS. These datasets enabled the identification and recording of archaeological features no longer visible at ground level, or visible only under certain soil conditions. In the summer of 2015, prior to the pedestrian survey, I established tentative locations of all the sites that the survey would attempt to visit, and these datasets helped with reaching and

[6] Worldview 2 8-band multi-spectral and panchromatic imagery, collected on July 5th 2012.

identifying sites on the ground. Identifying site location in satellite imagery also enabled the diachronic tracking of damage to the fortresses and other sites in the region from development, agriculture and military activity.

Agios Sozomenos Regional Survey

A major component of the fieldwork for this dissertation was the completion of a regional survey. Exhaustive archival research produced a list of 27 possible Bronze Age sites previously recorded in the region, but it was necessary to resurvey the region, both to assess damage and improve the quality of the data regarding the surviving sites. Spatial data concerning both location and extent of the sites from former surveys was unreliable, and the chronology and function of most sites was known only from very limited judgmental, or "grab", collections of surface material. Therefore, for 5 weeks in September and October of 2016 with a team of 2 to 4 colleagues, I completed a new extensive survey of the region, with the intent to relocate as many previously identified sites as possible. Promising sites were then chosen for more systematic and intensive survey in order to obtain improved spatial, functional and chronological data (Monahan and Pilides forthcoming). The results of the archival research and the present field survey have been filed with the Department of Antiquities, and will be used to update the Department's digital catalog of archaeological sites, as part of the CADiP (Cyprus Archaeological Digitization Programme) database.

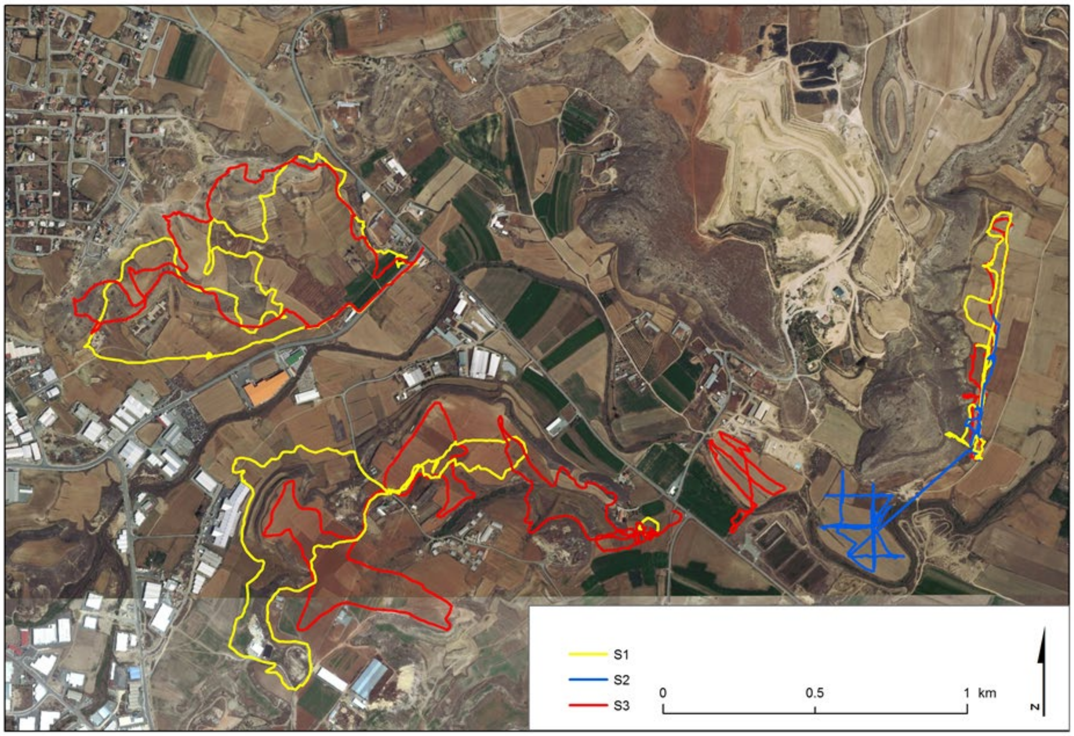


Figure 5.6 - *Selected GPS tracks from extensive survey of western portion of study region. The blue track shows movement during intensive survey at Glykia Vrysi.*

Extensive Survey

In order to relocate sites known from previous surveys, I selected cadastral fields based on the results of my archival research and evidence from aerial and satellite imagery. A team of three walked across the fields, maintaining roughly 15-20 m spacing between surveyors and counting artifacts to establish a sense of the density of cultural material. We also collected small judgmental samples of ceramics to help determine the nature or chronology of sites. The team recorded tracks with handheld GPS units, allowing us to check our coverage and target further days' efforts (Figure 5.6). When a marked increase in artifact densities or other evidence such as visible remains of architecture were located, we assessed the suitability of the site for more intensive and systematic survey. Some fields in the valley could not be revisited because of agricultural activity, including plowing and manuring, which at times reduced surface visibility to zero. We also encountered problems surveying the fortified sites on the plateau, where severe erosion and deflation has left very little surface material, so that we had to adapt survey methods to each site's unique conditions.

Of the 27 previously identified Bronze Age sites in the study region, we successfully relocated 16 through the extensive survey (Figure 5.7 and Table 5.2). Of these, we subsequently revisited 11, including the three fortresses, for more intensive survey. Of the 11 sites that we failed to locate, I suspect that at least five were destroyed by mining or other modern development activities. Another two atop the plateau were probably ephemeral to begin with, and one site remains inaccessible within the Buffer Zone, although it may be possible to investigate at a later date. In addition to the previously recorded sites, the survey crew walked an additional 64 cadastral fields, primarily in the south and west of the survey region, where it seemed coverage from previous surveys was less thorough. In this manner, we discovered two new sites. We also recorded a fairly consistent, but quite thin (<2 sherds/100 m walked) scatter of highly abraded Bronze Age and Iron age ceramic sherds across the fields and plateaus south of the Alykos. There was no evidence for architecture or groundstone tools, so it is likely that this territory was used only for intermittent agricultural or pastoral activities.

Site Name	Site Type	Result
Dhali *Kafkallia*	Fortress & Settlement	Surveyed
Dhali *Kafkallia*	Cemetery	Destroyed
Nikolidhes	Cemetery	Located
Dhrakondospilios	Cemetery	Not Located
Glykia Vrysi	Fortress & Settlement	Surveyed
Glykia Vrysi	Fort	Excavated
Nikolidhes	Farmstead	Destroyed
Nikolidhes	Fortress	Excavated
Muttaes	Farmstead	Located
Meloutzia	Farmstead	Located
Teratsies	Settlement	Surveyed
Muttaes	Cemetery?	Not Located
Galatere	Settlement	Surveyed
Kakoskalin	Settlement	Located
Kokkines	Unknown	Located
Laxia tis Skalas	Unknown	Not Located
Laxia tis Lourismenou	Unknown	Destroyed
Barsak	Fortress	Excavated
Vathia Gonia	Settlement	Destroyed
Djirpoulos-Ambelia	Settlement	Excavated
Bezinargos	Settlement?	Not Located
Djirpoulos	Cemetery	Destroyed
Ambelia (West)	Settlement	Excavated
Ambelia (West)	Cemetery	Surveyed
Ambelia (East)	Cemetery & Settlement	Surveyed
Kamini/Ambelia (East)	Settlement	Surveyed
Kafkalla tis Dhrakontias	Settlement?	Not Located
Potamia *Ambelin*	Settlement	Located
Potamia *Katsikoronia*	Cemetery	Surveyed
Dhali *Ayios Demetrianos*	Settlement?	Not Located

Table 5.2 – List of Bronze Age archaeological sites in the Agios Sozomenos study region and present status as result of survey.

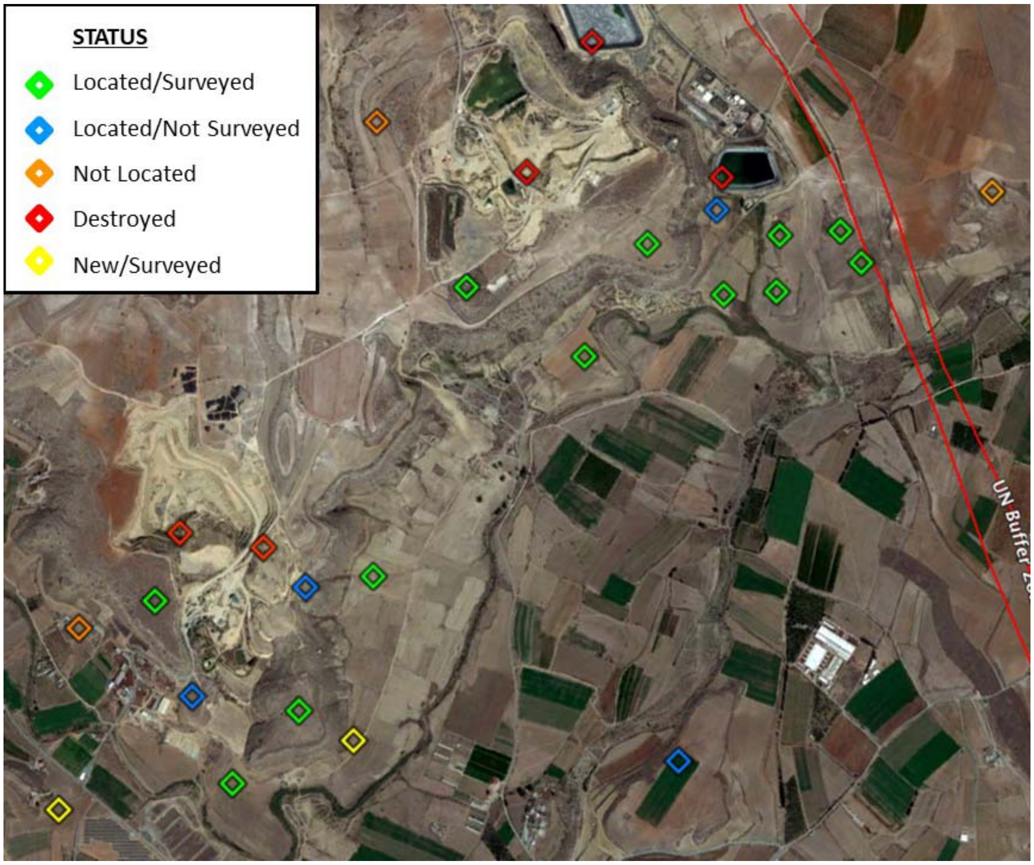


Figure 5.7 - *Map of Sites from 2016 ASESP Survey.*

Intensive survey

Five large (>1 ha) areas were selected for intensive, systematic survey. These areas were Potamia *Katsikoronia* and Agios Sozomenos *Glykia Vrysi*, *Mouttaes*, *Galatere/Kakoskalin*, and *Ambelia*. The intensive survey at *Ambelia* encompassed an area that previous surveys recorded as four or more separate sites and covered more than 6 ha. of ground. Although there was no significant break between these sites, I divided the survey of *Ambelia* arbitrarily into East and West, along a modern road passing through a shallow saddle in the center of the site. I also surveyed the newly discovered site at *Teratsies* systematically, although the presently visible extent of the site was less than 1 ha. In order to survey the sites, I modified the "transect interval sampling" method (Chartkoff 1978) similar to that utilized by John Cherry in the survey of Keos (Cherry et al. 1991:29–30). Using handheld GPS units, we established one or two N-S and E-W transects across and extending beyond the expected area of a site (Figure 5.8). Along these transects we established 2m radius (12.6 m^2) collection circles every 20 meters, making 100% collection of portable artifacts within each circle. Groundstone was recorded by its general type (e.g. quern, mortar, hammerstone, etc.), photographed, weighed, and left in the field near the original findspot. Non-diagnostic pithos (arbitrarily defined as pottery >1.5 cm thick) sherds were counted and weighed, before also being left in the field.

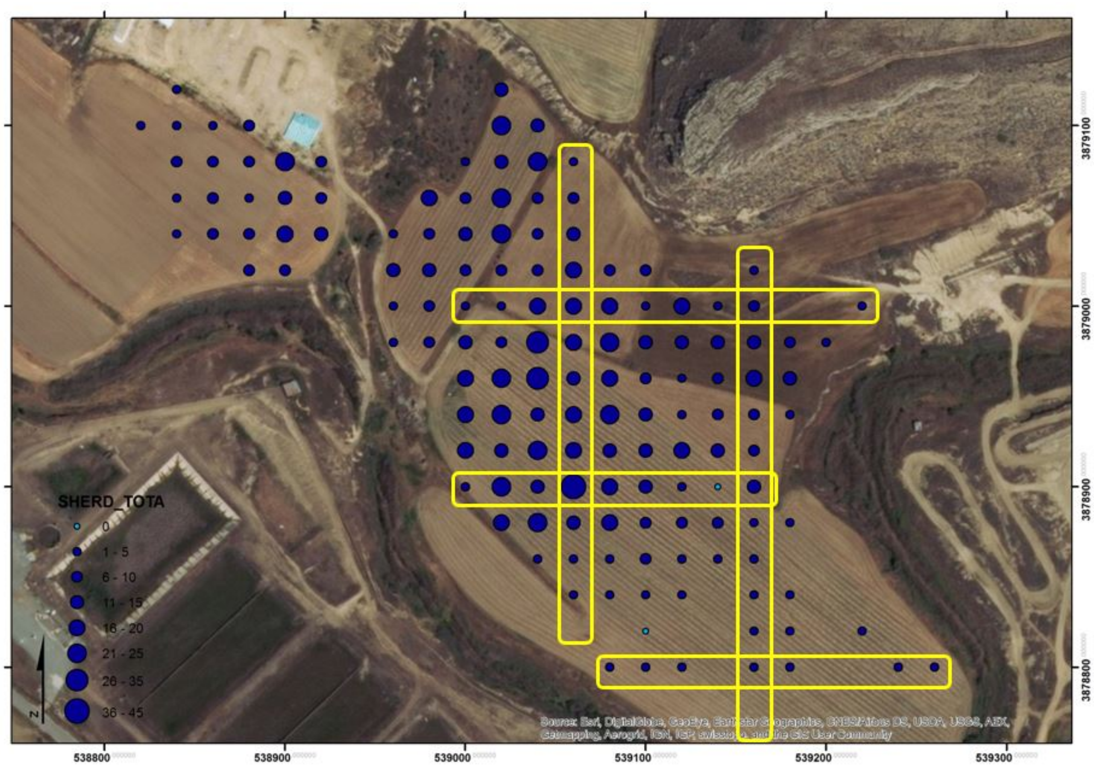


Figure 5.8 – *Map of Total Sherd count data from intensive survey at Glykia Vrysi. Each circle is a collection unit. Yellow highlights the transects made on the first day (visible as the blue track in Figure 5.7).*

Preliminary artifact counts were immediately entered into a database for integration in a GIS, allowing same-day visualization and assisting us when we returned to extend transects, if needed, to capture the full extent of the surface scatter of a site, or to fill-in areas on the same 20x20m grid. This system proved very efficient, and we were able to cover significant portions of *Galatere*, *Ambelia*, and *Glykia Vrysi* on a complete 20 m x 20 m grid. As we recorded all of the data from 12.6 m^2 area from each 400 m^2 grid block, the data presents a systematic, stratified sample consisting of 3.2% of the surface material across each site. Two sites, Agios Sozomenos *Mouttes* and *Katsikoronia,* were surveyed systematically, but after preliminary analysis of the ceramics from the initial transects I determined that only a very minor component of each site dated to the Bronze Age, so further research at these locales was abandoned.

At *Ambelia West* the area of highest artifact density was further sampled on a 10x10m grid, to guide future excavation (Figure 5.9). *Teratsies*, a small LC site below *Nikolidhes*, was also partially surveyed on a 10m grid due to the site's more compact nature. The resulting data will allow analyses of artifact distribution across the sites, suggesting different functional areas or pointing to spatiotemporal development of a site, as well as guiding future excavation. Additionally, a hillock at the north end of *Ambelia West* was targeted for 100% recovery as this area clearly contained an important LC structure, evinced by massive quantities of ceramics and visible exposures of architecture, all of which were under immediate threat of damage by plowing, military trenching, and hunters' vehicles. At this site we collected six crates

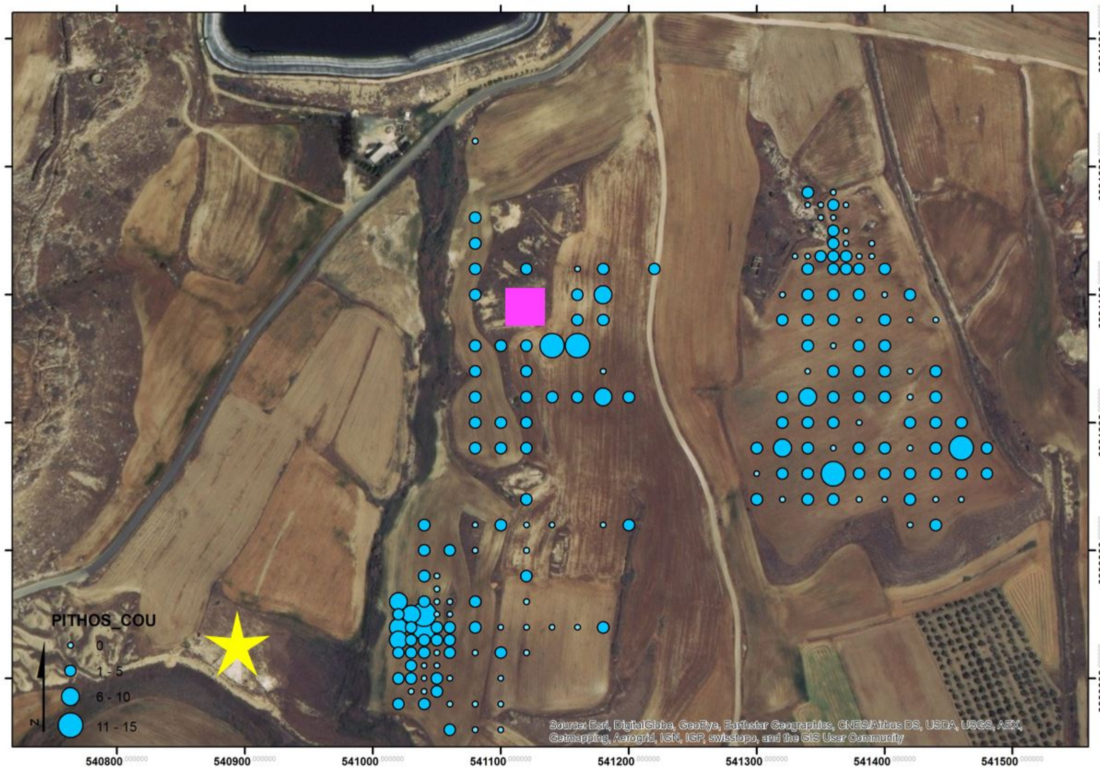


Figure 5.9 – *Map of Pithos sherd count data from intensive survey at Ambelia. Yellow Star = ASESP's excavations at Ambelia-Djirpoulos. Pink Square = marks the area of 100% collection in Ambelia West, where ASESP excavated an LBA storage building in 2017.*

of ceramics, and weighed and discarded over 140 kg of undiagnostic pithos, from an area of 732 m². ASESP then undertook excavations at this hill in 2017 and 2018, where they uncovered the remains of a significant Late Bronze Age storage building (Pilides 2017b; 2018a; 2018b). It is hopes that the high level of spatial resolution in the survey may permit close correlation of the survey collection with the underlying architecture.

Survey of the Fortresses

The nature and chronology of the fortresses atop the plateau required further clarification, but as previously mentioned, severe erosion has left the fortresses with little surface material. Somewhat ironically, at *Barsak* and *Nikolidhes*, where modern military activity has severely impacted the landscape and ancient architecture, that same activity provided a unique opportunity for us to develop alternative data collection methods: at these sites military trenches were walked and artifacts collected from the sections and spoil heaps, and the locations of architecture found in section were recorded.

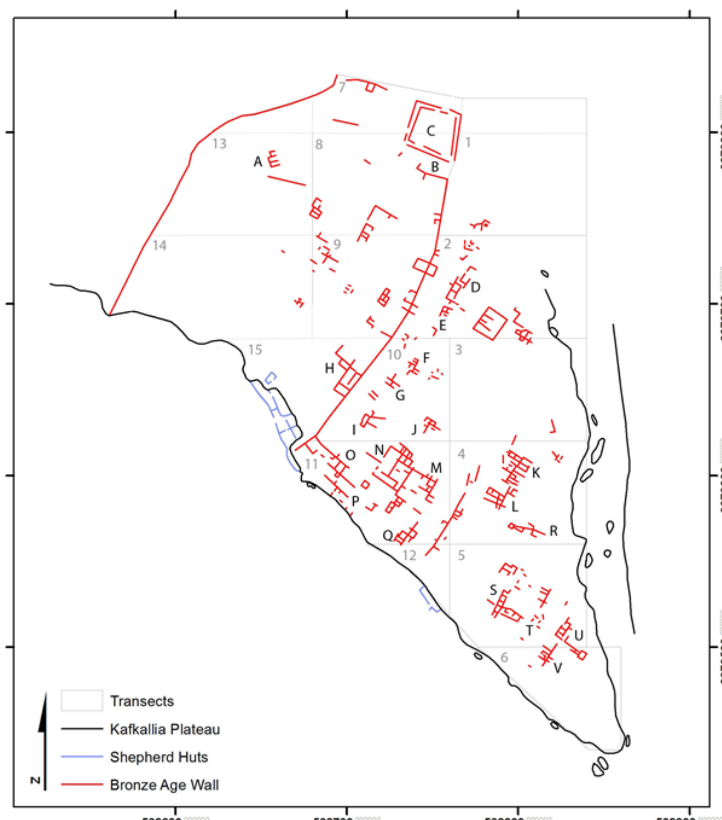


Figure 5.10 - *Map of Kafkallia with survey transects and architectural units labeled. (Map by Sandra Rosendahl, after Overbeck and Swiny 1972, Plate 1)*

At Dhali *Kafkallia*, there is extensive internal architecture visible on the surface, but still very limited quantities of artifacts, so a different strategy was needed. Using a digitized map of the architectural remains at *Kafkallia* recorded by Overbeck and Swiny in 1972, the site was divided into tracts. We walked these tracts in 10 m spaced transects, and when clearly recognizable architectural units were encountered, material from within the architecture was collected and recorded separately (Figure 5.10). Despite our best efforts, material recovery from all the fortresses was still low, particularly at *Nikolidhes*, so all chronological estimates should be considered tentative, and subject to revision with the collection of further data.

Excavation at the Fortresses[7]

In 2015 and 2016, ASESP excavated at multiple locations in the Ayios Sozomenos region (Pilides 2018). For two weeks in October 2015, I supervised the excavation of two trenches at *Barsak* and a program of wall cleaning and excavation of one small test trench at *Nikolidhes*, and I returned to *Barsak* with ASESP in October 2016 for further investigation of the architecture. All ASESP trenches are named using the conventions of the Cyprus Department of Antiquities, based on a 5m x 5m grid centered on a fixed datum established near the excavations at *Djirpoulous*, and established by high-resolution RTK GPS. This stands in contrast to

[7] The complete results of the 2015 excavation season are included in this dissertation, and I am co-authoring their publication with Despina Pilides.

the 20 m x 20 m grid used in the survey, using lower resolution hand-held GPS units. Excavation was completed by context, with each context assigned a unique Green Number. Each Green Number is described, measured, and drawn, and archaeological material collected and recorded. The excavations are described briefly here and the results are presented in the site descriptions below.

The 2015 excavations at *Barsak* revealed the remains of the perimeter wall in two different areas of the site: a 3m x 5m trench (-37/66) in the southeast and a 4m x 4m Trench (-70, 96) in the northwest (Figure 5.11). The trench in the northwest began as a 2m x 6m trench across the rubble pile indicative of the perimeter wall location. As the rubble was cleared and the location of the wall became clear, the trench was extended 2m to the north, and expanded to 4m wide. This resulting 4m x 4m area was the target of all further excavation.

Figure 5.11 – *Northwest Enclosure wall at Barsak after 2015 excavations.*

ASESP returned to *Barsak* in 2016 with the goal of exploring the interior of the enclosure for evidence of internal architecture and site function (CDA 2016). Three 5m x 2m trenches (grid locations -46/95, -46/96, and -48, 98) and three 5m x 1m trenches (-43/103, -43/104, -43/105) were opened in areas where we anticipated sufficient soil where we hoped there might be preserved deposits. Instead, all five trenches were less than 50 cm deep before reaching sterile soil or bedrock, and empty except for small quantities of worn sherds. An additional trench (-43,99) opened adjacent to the interior side of the enclosure wall uncovered in 2015 at similarly found no material (Pilides 2017a:164).

Sturt Manning and Thomas Urban visited *Barsak* for one day in September 2016 on invitation by ASESP, and completed two *ad hoc* out-and-back transects with a Ground Penetrating Radar starting inside the enclosure, crossing over the enclosure wall, and then continuing approximately 30 m outside the wall, with the goal of collecting more information about the anomalies visible in the aerial imagery of the site. One transect ran SW-NE over the eastern enclosure wall, and one ran S-N over the northwestern enclosure wall. In both instances, while observing the real-time readings from the radar unit, Urban reported distinct anomalies 15-20m outside the enclosure wall. This distance correlated well with the dark signature visible in the aerial and satellite photography of *Barsak*, presumed to be the result of differential soil drainage and higher moisture retention.

These results guided the next phase in the excavations at *Barsak*. We established four 1m x 1m test trenches (-70/97, -70/98, -70/99, and -70/100), at 5 m intervals extending northward from the northwestern enclosure wall. The first three trenches were completely empty, and we reached bedrock in less than 50 cm. We halted excavation of the fourth test trench (-70/100) when, at a depth of 1.5 meters it was no longer possible to dig down in the tight confines of a 1m x 1m test pit. We then opened the 1m x 4m area between the test units at -70/99 and -70/100 to understand what was happening in the intervening distance, thus uncovering the remains of the outer perimeter wall adjacent to an external ditch (Figure 5.12). To confirm that this was not a unique occurrence, a 1m wide trench was also dug heading north across the eastern enclosure wall of the fortress (Pilides 2016; 2017a:164; 2018b:80–81).

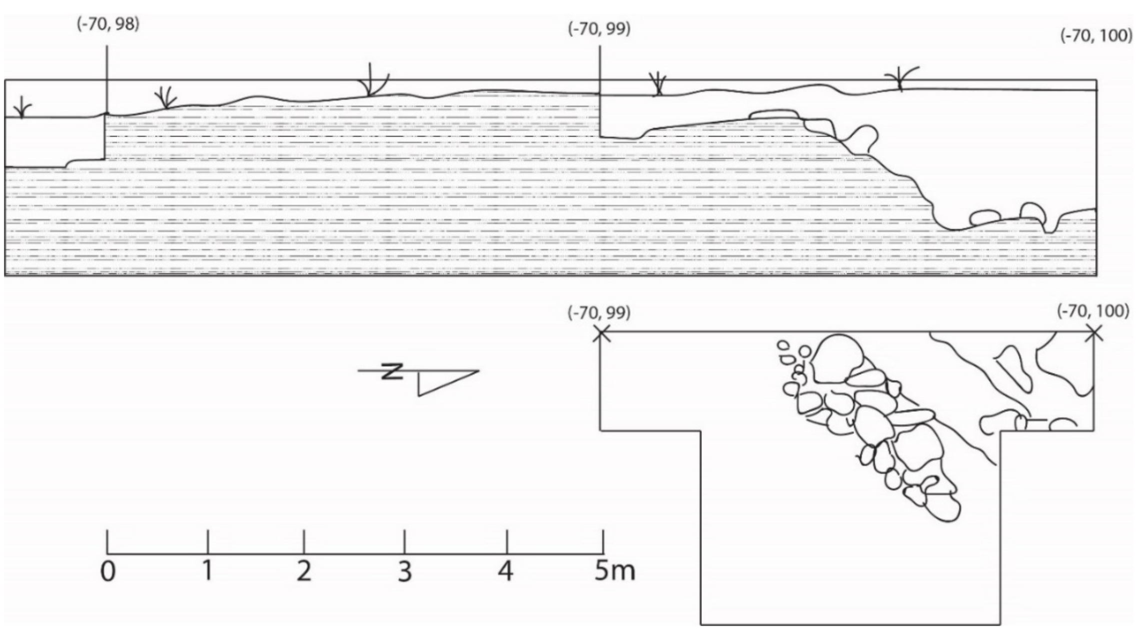


Figure 5.12 - Profile (above) and top plan (right) of 2016 excavation of outer wall and ditch in north at Barsak.

In 2015, following the completion of the two trenches revealing the enclosure wall at *Barsak,* we spent two weeks investigating the so-called "bastion" in the northeast section of *Nikolidhes*. We first established a 1.5m x 4m trench (-306/-246) horizontally along the south edge of the rough ashlar wall, east of the looter's pit in which the wall was visible. We also clarified the path of the ashlar wall, and the structures to which is connected, through extensive surface scraping to a depth of <20 cm. ASESP continued excavation in 2017 and 2018, slowly revealing the relation between the circuit wall and the tower (Pilides 2018a; 2018b).

Artifact Processing

Initial processing of ceramics in the field from both survey and excavation entailed washing, counting, and separation into diagnostic and undiagnostic sherds. As this study focuses on the Bronze Age, later materials were recorded as "Late" unless of an easily recognized diagnostic type, such as Classical/Hellenistic Black Glaze, Terra Sigillata, or medieval Sgraffito ware.

Non-diagnostic sherds for each collection unit were counted and recorded by ware, thickness (fine = <.5 cm, medium = 0.5 - 1 cm, large = 1. - 1.5 cm), and, when possible, whether the vessel was open or closed. Non-diagnostic pithos sherds (> 1.5 cm thick) were not collected, but added to final counts. Diagnostic sherds were pulled for coding and photography, and a smaller selection was made for drawing. Diagnostic sherds were rims, handles, bases, or other sherds diagnostic to vessel form, or were incised, painted, or otherwise decorated.

Site Toponym	# of Units Collected	Total Sherd Count	Diagnostic Sherds
Ampelia East	52	864	153
Ampelia West	104	639	126
Ampelia W. Hill	183	2187	113
Barsak	12	236	41
Kafkallia	35	385	62
Glykia Vrysi	87	1083	218
Teratsies	28	157	8
Mouttaes	24	201	42*
Katsikoronia	53	404	48*
TOTAL	578	6156	721

Table 5.3 – Summary of ceramics collected and analyzed from 2016 ASESP Survey. Starred ceramics were not fully analyzed or included in the total diagnostic count, because the sites were recognized to not have a significant BA component.

Sixteen crates of ceramics were collected during the 2016 survey season. Over 200 kg of pithoi were discarded in the field. Including those pithos sherds, 6156 sherds were collected in 578 collection units, and 721 diagnostic sherds were analyzed (Table 5. 3). Ceramics from the excavations at *Barsak* and *Nikolidhes* were few, and mostly non-diagnostic, but they too were recorded and analyzed. The only other artifact discovered during excavation was a broken RPIV spindle whorl from *Barsak*. During survey, other artifact types encountered and recorded were groundstone, chipped stone, and slag. Chipped stone and slag were collected, but presently remain unanalyzed beyond simple counts.

Agios Sozomenos Fortress Descriptions

Dhali *Kafkallia*

The site of Dhali Kafkallia covers over 5 hectares and contains extensive remains of domestic architecture (Figure 5.13). A massive circuit wall, over 2 meters thick in places, does not enclose the bulk of the settlement. Instead, another large (>1.2 m thick, 180 m long) wall divides the settlement into two parts, the northern of which is then encompassed by a more significant (1.3-1.8 m thick, 230 m long) curved wall. The resulting configuration still serves to largely cut off access to the narrow triangular promontory, where the more densely settled southern part of the settlement lies. The enclosure walls are built of a shell-style construction with well-built inner and outer faces made of roughly shaped local calcareous sandstone, dimensions ranging from 30 cm to 1 m. The much smaller walls of the structures inside the settlement are generally only 25-40 cm wide, or one to two fieldstones wide. All surviving walls, including the enclosure, are preserved to at most 2-3 courses of stones. It is likely that much of the stone foundations were robbed out and used for construction projects in later centuries, but it is also likely that, like many prehistoric and modern Cypriot constructions, the bulk of the walls would have been made of mudbrick.

Notably, the edges of the site that are protected by high and steep cliffs remain unenclosed, suggesting a conservative attitude of the builders to the expenditure of effort and material. The 2016 survey recovered significantly more ceramics from the southern promontory, which also appears to have been much

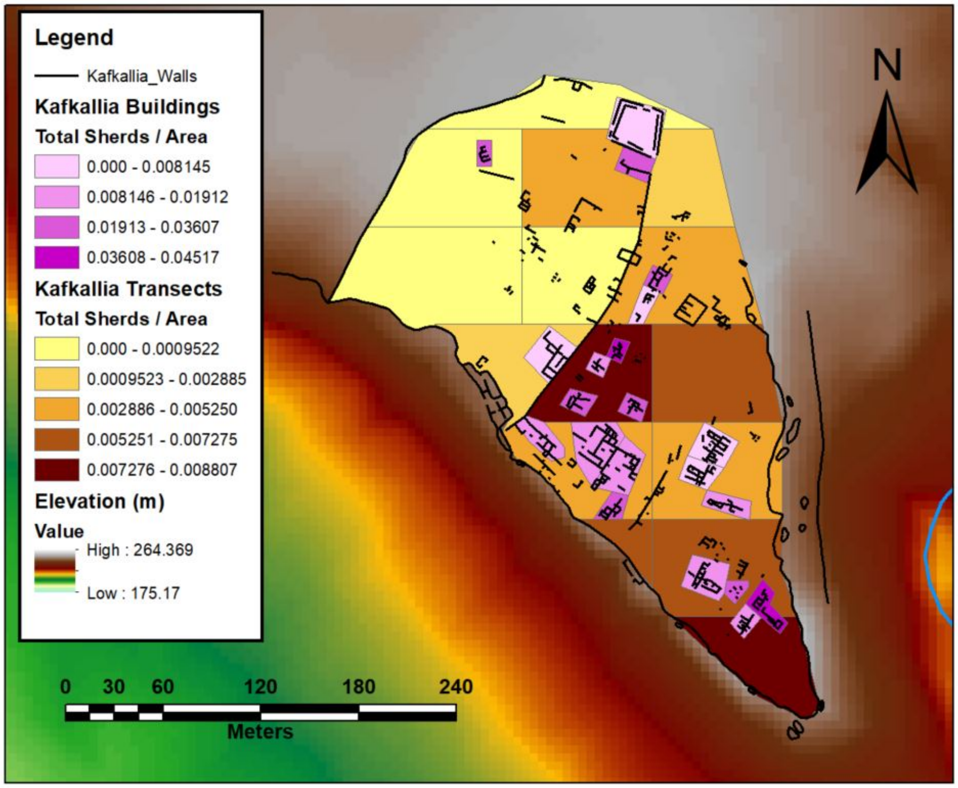


Figure 5.13 – *Map of Total sherd count data from surface survey at Kafkallia. Values normalized by size of collection area to sherds/m.*

more densely inhabited than inside the fully enclosed space. Erosion is so severe this may just be a function of preservation, but it more likely indicates that there was more domestic activity on the southern promontory, while the enclosure may have been added later, and kept largely empty for much of the site's occupation – perhaps serving as a defensive area for the village's livestock.

Overbeck and Swiny (1972) recorded the remains of at least 25 structures in the settlement, most of which can still be seen today. Of the recorded structures, less than 1/3 are actually within the enclosure, while the great majority are located on the isolated southern promontory. There is a 15m wide gap, or buffer zone, between most of the domestic architecture south of the central enclosure wall and the wall itself, but there are a few structures, as well as the stubs of several spur walls, that abut both sides of the enclosure wall. The haphazard manner in which domestic architecture appears to spread only partially into the enclosure may indicate that the enclosure was built later than the founding of the settlement, which then continued to grow and expanded into the previously empty enclosure. It seems unlikely that the settlement began within the enclosure and then expanded out of it, as there appears to be plenty of empty space left inside the enclosure, and as an independent structure the enclosure would actually be quite inefficient, using a lot of wall to protect a relatively small area. This, and the irregular distribution of structures, suggests an overall ad hoc approach to construction and use of space that developed organically over the duration of the site's occupation.

A heavily built 25 m x 25 m tower or bastion at the northeast corner of the enclosure looks over the likely entrance routes to the site, and was probably adjacent to any gates or restricted passage into the fortifications or promontory. The walls of the tower are nearly 3 m thick, and consist of two widely spaced rows of large fieldstones, the interior of which was filled with soil and small rubble, the same building technique used for the enclosure wall. There is no visible entrance to this space, and the floor, at least now, is bedrock, with no evidence for postholes, spur walls, or other means of supporting a roof over the central space. It is possible that this space was open to the sky, but just as likely that the floor and wooden column supports are now missing.

Although no definite gate survives, the structure immediately south of the tower is a strong candidate for the entrance to the northern enclosure. The lack of controlled access to the promontory where the majority of the domestic structures are located, however, seems unlikely. A long wall immediately below the eastern cliff of the promontory was already badly damaged when mapped in 1972, and has now been eliminated by a new road. It may be that this wall would have continued westwards and met with the tower/bastion, or perhaps there was another wall, now destroyed. Certainly the route from the southeast was the most likely means of access to the site from the river valley below, as it is today. Although now destroyed by the sand mine, the route also would have passed by Glykia Vrysi ("Sweet Spring"), the perennial stream of potable water that once originated atop the plateau and ran through the gully between the promontories of *Kafkallia* and *Nikolidhes*. This spring was undoubtedly the water source for the settlement. The only other feasible route to the settlement would be from the north, across the plateau.

The material recovered during survey was limited, but it was perfectly consistent with a domestic assemblage of the Middle Bronze Age (Figure 5.14). More material of all types came from the promontory than from within the actual enclosure. Ground stone of all sizes and types were recorded, especially grinders. Two large broken saddle querns were recorded, as well as more than a dozen round and rectangular basins carved into the bedrock that would have served as mortars or mealing bins. Ceramics collected from survey were predominantly Red Polished ware. Vessel parts recovered were primarily bowl rims or open spouts and vertical

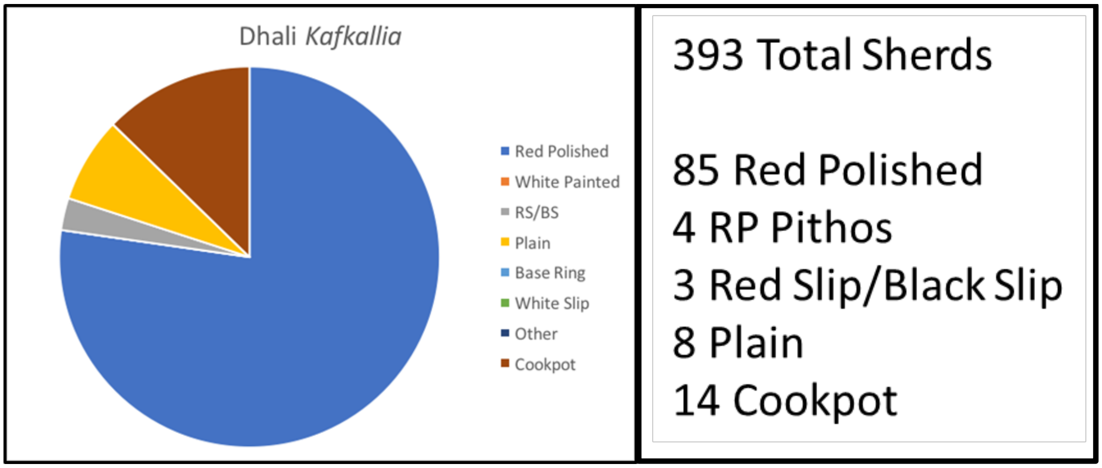


Figure 5.14 - *Ceramic wares recovered during survey at Dhali* Kafkallia.

lug handles, also from bowls, and a couple of very typical BA cookpot handles. As mentioned previously, the main pottery ware from Kafkallia has previously been identified as RPIV. Indeed, the well-fired gritty brown fabric, with a thin burnished orange-brown slip exterior is consistent with this identification, but as mentioned previously, it also matches the Red Polished B ware from the Middle Cypriot settlement at Alambra *Mouttes*, located just 8 km to the west. This may indicate an earlier date for the settlement at *Kafkallia*, partially contemporaneous with *Mouttes,* which was occupied in the ECIII-MCII. This date precedes the MCIII-LCI dates during which all fortresses were thought to have been built. However, the limited ceramic evidence, as well as the free-standing rectilinear domestic architecture also support the site's continuing use into the MCIII, although the lack of other late Middle Cypriot ceramics is striking. The suggestion that the settlement may have been occupied prior to the enclosure being built means that a later MCII or MCIII date for the fortifications is perfectly possible. However, there is no ceramic evidence for occupation beyond the Middle Bronze Age, and although it seems likely that the enclosure wall was a later addition to the site or may even have been built in stages, without stratigraphic evidence this remains speculation.

Agios Sozomenos *Barsak*

Barsak is located about 3 km to the northeast of *Kafkallia*. It sits on a dramatic promontory on the most eastern extent of the plateau, protected by the mesa's highest and most vertical cliffs. The enclosure wall that is partially visible on the surface today is 1.8 to 2 meters thick, and surrounds the entire site, including more than 360 meters of its length which are also protected by a precipitous drop off the 40 m high cliffs. Like *Kafkallia*, *Barsak* likely had access to a good water supply in the form of a perennial spring that originated less than 500m away on top of the plateau. Unlike *Kafkallia* though, *Barsak* has no easily traversable route to the valley floor immediately adjacent to the site. Instead, getting off the plateau requires a journey either 1 km north to where the plateau slopes gently down, or 1 km southwest to a switch-back path that takes advantage of the natural topography to successfully negotiate the cliffs behind the modern village of Agios Sozomenos.

Barsak's interior enclosure wall that faces the interior of the plateau may be divided into two portions that meet at a near 90-degree angle in the north corner of the site. That intersection is now destroyed by a large earthwork built by the Cyprus military as a tank emplacement, but the 1963 aerial photos show no indication of a gate or tower previously located here before the emplacement's construction (Figure

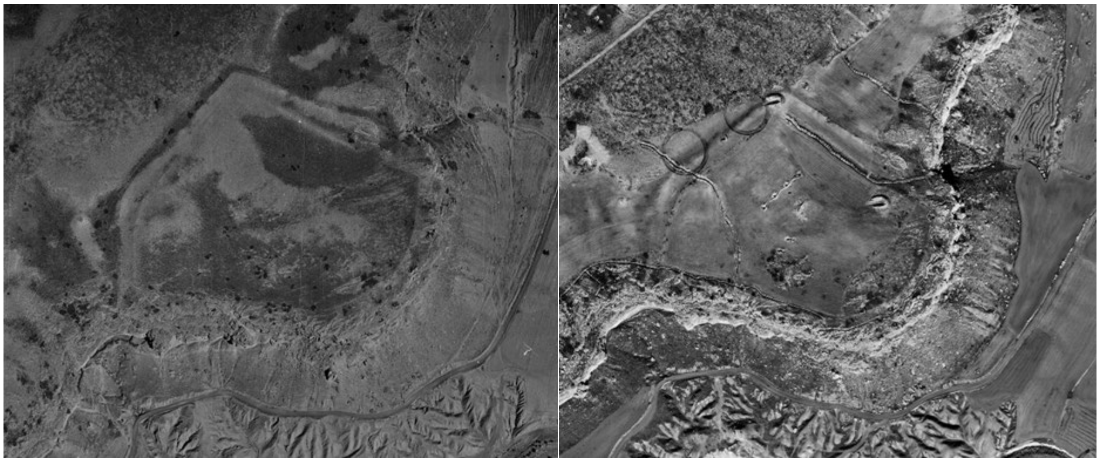


Figure 5.15 – *Detail of 1963 (left) and 1993 (right) aerial photographs of Barsak. In the 1993 image, recent military trenches and earthworks are visible, while both images clearly show the course of the subsurface outer enclosure wall and ditch. (Photographs courtesy of Cyprus Lands and Surveys)*

5.15). The eastern wall segment runs perfectly straight for 190 meters before it meets the southern wall. Again military construction, in this case a trench that runs 5-10 m in from the edge of most of the eastern half of the plateau, has destroyed the intersection. Neither the profiles of the trenches nor the historical images reveal the presence of any additional architecture that might indicate a tower or gate. The western wall also runs straight for nearly 150 m, before it curves to the south to meet the wall at the cliff. Here the military trench and a farmer's road have damaged the wall, but as in the other "corners" of the site there is no evidence for architectural elaboration or an entrance. The southern wall, which runs along the cliff edge, is 1.8 meters wide, and faced in medium-large (30 – 50 cm) rough fieldstone, and the interior appears to have been mostly filled with smaller rubble and soil. In contrast, the walls that face the interior of the plateau are 1.8-2.0 m thick. The faces of these walls contain a higher proportion of larger stones (50 – 70 cm), and the interior is densely filled with larger rubble and little soil.

The small amounts of rubble found adjacent to the southern wall during the 2015 excavations suggests that either stone from the wall was robbed out in subsequent periods for use in construction projects in the valley below, or the wall was never more than a few courses of stone, most likely capped by a mudbrick superstructure. The excavation of the wall in the northwest uncovered large amounts of stone wall collapse both towards the interior and exterior of the perimeter wall, though substantially more was found towards the interior, where the bedrock was also lower. The quantity of building material in the collapse is sufficient to build the wall to at least the same height again as currently preserved, indicating that the stone portion of this stretch of wall was likely over 1.5 m in height. Again, it is likely that some stone was removed from the area and/or there was a mudbrick superstructure.

About 1/4 of the area enclosed by these walls is exposed bedrock, while the remainder has been illegally farmed and plowed. There are large quantities of small and medium sized rubble (10-30 cm) mixed in with the soil, which is otherwise the same fine pale reddish-brown sand-silt as elsewhere on the plateau. Whether this rubble comes from the now collapsed enclosure wall, or from destroyed internal architecture is not certain, but there is no indication of internal architecture in the 1963 aerial photographs, any of the test trenches or military trench profiles, or identified during survey. Thus the current evidence supports the conclusion that *Barsak* was, in fact, a large empty enclosure.

As hinted by aerial and satellite imagery, and confirmed in the 2016 ASESP excavations, the fortification system at Barsak is more complicated than what is visible on the surface today, with a second wall running parallel and exterior to the main enclosure wall on the west and north sides of the site facing the interior of the plateau. This wall appears to run between 15 and 20 meters outside the main wall. The actual stones of the exterior wall have only been seen in two 1m wide excavation exposures, where only 1-2 courses, 70 cm wide, remains. However, the wall can be easily traced in the earliest aerial photographs, and was likely somewhat wider and has partially collapsed in places into the ditch running immediately outside it. The ditch is more enigmatic and requires further investigation, but the soil signature in the aerial photographs and the cuts in the bedrock where the ditch exits the plateau, suggest that the ditch is at least 5 meters wide. Excavation indicates that the ditch is at least 1.5 m deep, with steeply angled walls (see Figure 6.4).

The excavations in 2015 and 2016 through shallow deposits of loose soil produced no material suitable for radiocarbon dating, so like *Kafkallia*, the dates at *Barsak* are dependent on the rather scant ceramic corpus. Under the stone wall collapse in the southern enclosure wall trench (-37, 66) we recovered several pieces of a White Painted III-V Wavy-Line Style tankard (Figure 5.16) and a Black Slip jug, apparently crushed *in situ*, establishing a *terminus post quem* for the wall destruction of

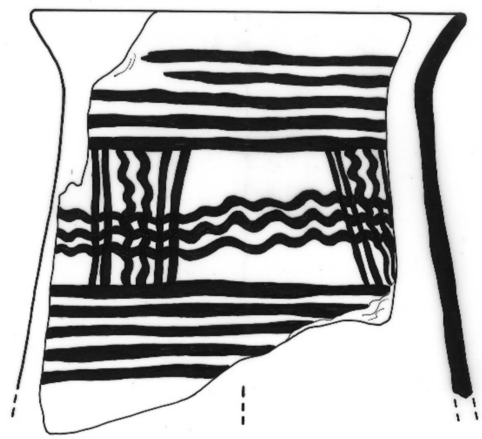
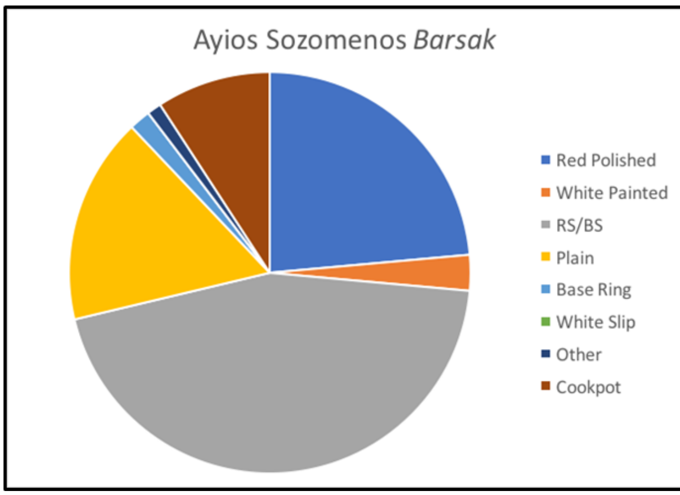


Figure 5.16 - *Barsak 3503.3 - White Painted Wavy-Line Style Tankard, 11 cm dia. rim, recovered beneath wall collapse inside main enclosure wall, 2015 SE trench. (Drawing by Clara Vasitsek)*

the Middle Cypriot III, ca. 1650 BCE. Ceramics from both trenches were primarily Red and Black Slip, Red Polished IV, and White Painted III-V, with a few sherds of large Plain White storage jar, all consistent with occupation in the Middle Cypriot III, possibly extending into the beginning of the Late Cypriot I, although no diagnostic ceramics exclusive to the Late Cypriot were recovered. Although a small sample, the ceramics are consistent with a domestic assemblage, including decorated fine wares such as the White Painted tankard and a Red Slip deer-head protome, various plain ware bowls, cookpots, and storage jars, and a plain Red Polished IV biconical spindle whorl.

Including the ceramics collected during survey, nearly half (45%) of the pottery recorded from *Barsak* is Red or Black Slip, and another quarter (24%) is Red Polished, of which most identifiable pieces are Red Polished IV. Cookpot wares are also a significant component (10%). Notably, there are also several pieces of Plain White ware, all of which appear to be handmade and most or all being from large storage jars or pithoi. This corpus is consistent with an MCIII date, likely extending into the early LC, although the lack of Plain White open forms, or any Base Ring or White Slip might indicate that any significant use of the site ended prior to the LCII (Figure 5.17).



209 Total Sherds

41 Red Polished
5 White Painted
78 Red Slip/Black Slip
29 Plain White
7 PW pithos
3 Base Ring
1 Bichrome
1 Red-on-Black
16 Cookpot

Figure 5.17 - *Ceramic Wares recovered during 2015-2016 ASESP Survey and Excavation at Agios Sozomenos* Barsak.

<u>Agios Sozomenos *Nikolidhes*</u>

The third and last of the enclosures atop the plateau, *Nikolidhes* is also the largest, with its enclosure wall encompassing ca. 5.5 ha. The site is located just 300 m southwest of *Kafkallia's* southern tip, though the sites are separate by the deep gully carved by the Glykia Vrysi stream, which presumably also served as *Nikolidhes'* water source. The square promontory on which Nikolidhes is perched is attached to the main body of the plateau by a narrow isthmus, at one point just over 100 meters wide, but despite having steep cliffs to the south and east, and rough, steep slope to the west, the enclosure wall of *Nikolidhes* completely encircles the site (Figure 5.18).

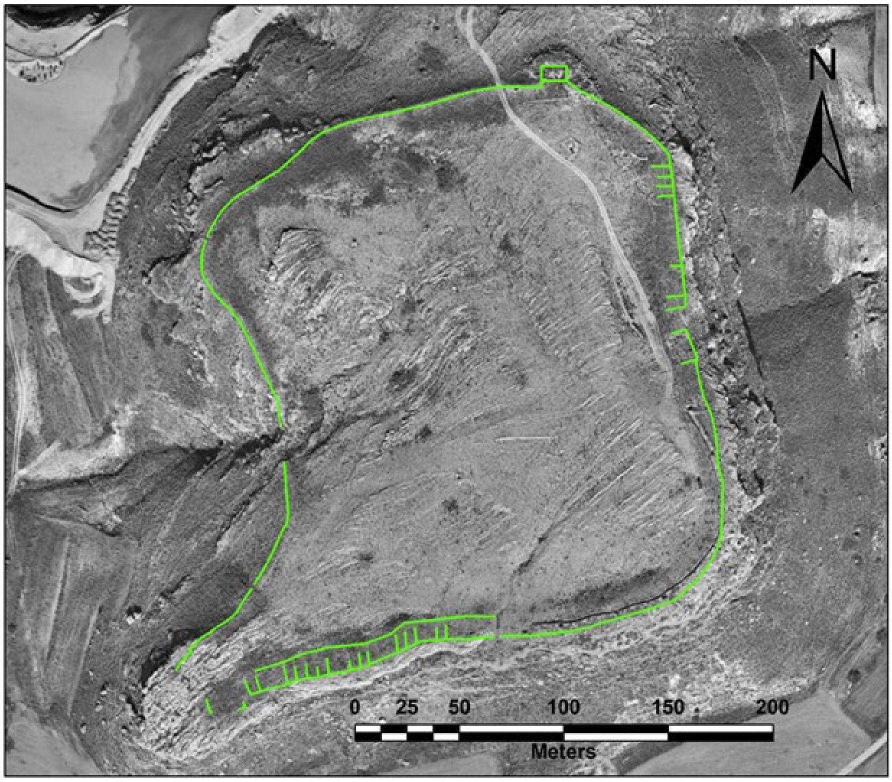


Figure 5.18 - *1993 aerial photograph of Nikolidhes, with architecture in green from image interpretation, surface mapping, and excavation. (Map after photograph courtesy of Cyprus Lands and Surveys)*

The enceinte wall itself is also the most massive of those of the Agios Sozomenos fortifications, measuring 2-2.2 m thick at most locations where both faces of the wall may be accurately located (contra Fortin 1981, who reports it only 1m wide). The wall is built in the same shell fashion as the inner wall at *Barsak*, with well-constructed faces of large fieldstones, possibly roughly shaped, and the interior filled with rubble. Also like *Barsak,* there are places where particularly large stones

(>1.5m high) were built into the wall. As the stones are sometimes flipped up to be balanced on a narrow side to maximize their outward appearance, it is clear that they had not been found *in situ* by the builders, with the wall built to accommodate them, but were intentionally placed.

Also, like *Barsak*, there is no confirmed gate installation. There are four places where there are clearly intentional breaks in the wall (Figure 5.19), but these breaks vary from just 1.2 – 2.7 m in width, and there is no evidence for architectural elaboration around the breaks. The largest break, located in the center of the southern side of the site, is immediately above an impassable cliff, so it could not have been an entrance. The other three, located on the western end of the north side (1.5 m wide), and the northern (1.2 m wide) and southern (1.6 m wide) ends of the western wall, open onto steep terrain that can be climbed, though not easily. It is possible that these were the entrances to the site, with their narrow size making them easily defended or blocked off. These breaks in the circuit wall would also serve as drains for rainwater, of vital importance to the stability of the construction. The circuit wall surrounds *Nikolidhes* at an elevation several meters below the highest elevation of the site. Especially during the heavy rains of early Spring, water pours off the cliffs of Agios Sozomenos in sheets,[8] and one may imagine what the

[8] I observed this phenomenon myself while excavating at *Djirpoulos-Ampelia*, directly below *Barsak*. It was clear that water management would be a concern not just to those living atop the plateau, but to those below it, where a mudbrick structure, if built in the wrong location, would be destroyed by the deluge coming down the cliffs.

water from a severe storm, if not given proper outlet, might do to a wall holding it back.

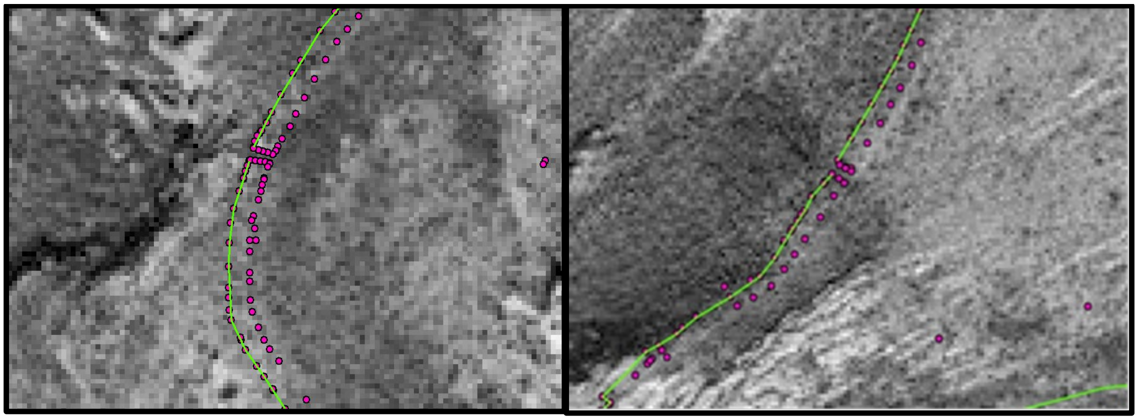


Figure 5.19 – *Intentional (built) gaps in the Nikolidhes enclosure wall, NW (left) and SW (right) corners. Pink dots = total station measurements at wall faces. Green line = interpreted outer face of the enclosure wall. (after detail of photograph courtesy of Cyprus Lands and Surveys)*

There are other apparent breaks in the enclosure wall, though it is difficult to discern whether these are intentional, or the result of erosion, stone-robbing, or collapse. The most notable are adjacent to the "tower" in the northeast and in the center of the western side where a gully cuts into the promontory. The current entrance to the site is 20 meters west of the tower structure, where a break in the enclosure wall has provided access to the promontory by motorized vehicles for decades. Given its proximity to the tower and the easy access it provides from the plateau, which is otherwise inaccessible from any of the other documented openings, it is tempting to believe that a proper entrance to the enclosure was once located here although the lack of elaboration in the vicinity of the break would argue against it.[9]

The second major break in the wall could also mark an original main entrance to the site, located where a steep, narrow gully cuts into the western side of the *Nikolidhes* plateau. Here the enceinte wall slopes down into the gully from both the north and south, and the enclosure walls terminate unevenly. There is a 15 m gap between them, and the northern stub makes a complicated step-wise turn as it negotiates the steep and uneven drop in the bedrock. Perhaps a gate was once located here and the wall has collapsed into the gully and been washed or carried away. In the 1963 and 1993 aerial photographs, a goat path is clearly visible entering the plateau from Glykia Vrysi by this route. When I traversed this path myself, I found it quite manageable, though my route was highly constrained by the natural rock formations, which would likely have been desirable for those who built the site. The terrain within the enclosure wall rises quickly to the east (10 m in elevation gained over 40 m) so if this area were an entrance it could be easily monitored.

Nikolidhes is even more eroded than *Barsak* and *Kafkallia*. Over 90% of *Nikolidhes'* surface area is exposed bedrock, on which there is no visible evidence of human occupation. However, unlike *Barsak*, there is more to say regarding internal architecture. In the northeast of the site, excavation has revealed the plan of a 15m x 7.5m tower (Pilides 2017a; 2017b; Pilides 2018a). The southern face (internal to the

[9] The most recent excavations by Pilides (2018) also raise the tantalizing possibility that the tower is part of an elaborate gate complex, with the entrance actually located directly east of the tower, and passing through the rough ashlar lined space.

enclosure) is built of large rectangular rough ashlars (Figure 5.20), and the other faces are built of large fieldstone, possibly roughly shaped. The interior appears to be completely filled with small rubble, held together with a reddish soil as mortar. The NW corner of the tower was excavated to its base, and the north face and the NW corner stone were missing, destroyed by the modern disturbance visible in the 1963 aerial photographs. This disturbance may have been the result of looters, or, if the north face was also ashlar, stone robbers. The remains of the tower now stand 1.2 m high interior to the enclosure (Pilides 2017a:107, pl. 17). The tower is surrounded by a dense rubble pile, containing some stones with dimensions over 1m. These stones are larger than the most of those presently visible in the tower's construction. It seems likely that the platform of the tower stood much higher than it does today, but there may also have been a structure atop it.

Figure 5.20 – *Rough ashlar wall on interior (south) face of Nikolidhes tower as exposed during 2015 ASESP exploratory excavation.*

The circuit wall does not meet the tower, but in the west they are joined by a well-built 3.2 m thick wall, also faced by rough ashlar on the side facing the interior of the site (Figure 5.21). This wall abuts, but does not join the circuit wall, so it seems that the tower was likely a later addition to the site, and a portion of the circuit wall was removed to make room for it. Similarly, where the circuit wall approaches the tower from the east it appears to have been rebuilt for the last 20 m, moving slightly up slope and narrowing from 2.05 m to 1.8 m . Whether, or how, this wall articulates with the tower remains unclear, and it is also possible that an entrance was located here (Pilides 2018b:82). The nature of the wall south of the tower remains unknown.

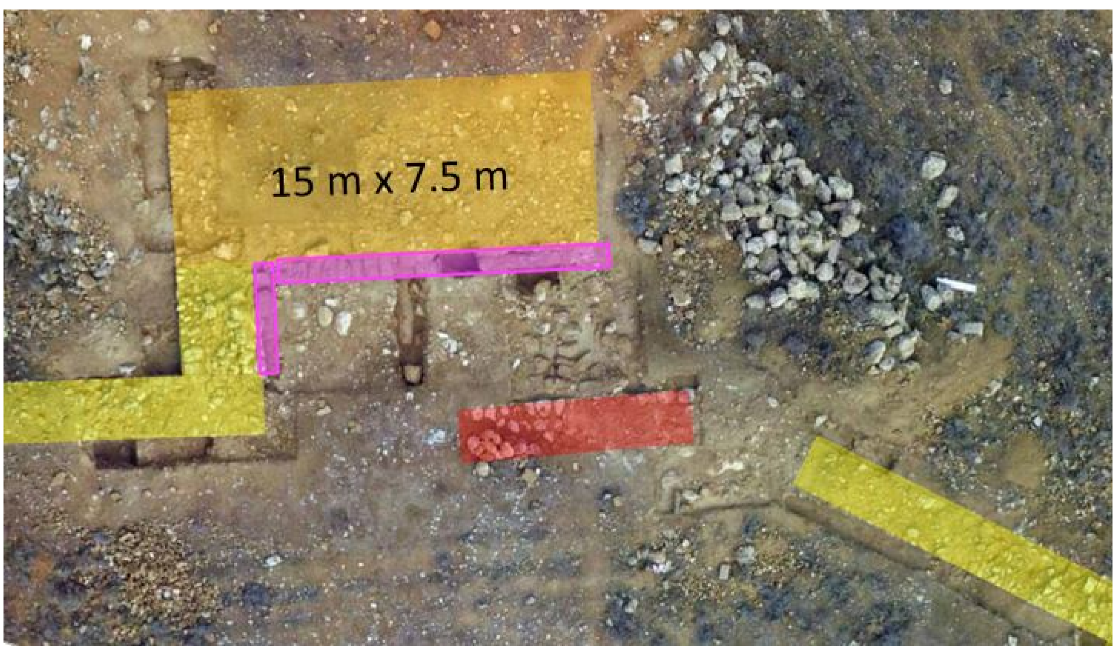


Figure 5.21 – *Interpretation of 2017 ASESP excavations of tower at Nikolidhes. Yellow = enclosure wall and addition. Orange = rubble filled tower platform. Pink = rough ashlar facing. Red = unknown wall. (after detail of photograph in Pilides 2017b).*

There are many more structures directly abutting the circuit wall that remain to be explored. During the 2013 mapping season several spur walls were recorded on the east and south sides of *Nikolidhes*. and using their visual signatures as a guide, I have identified at least 24 such spurs in aerial and satellite photographs of the site. These walls are all perpendicular to the circuit wall, and frequently appear to be relatively evenly spaced, roughly 5 meters apart (Figure 5.22).

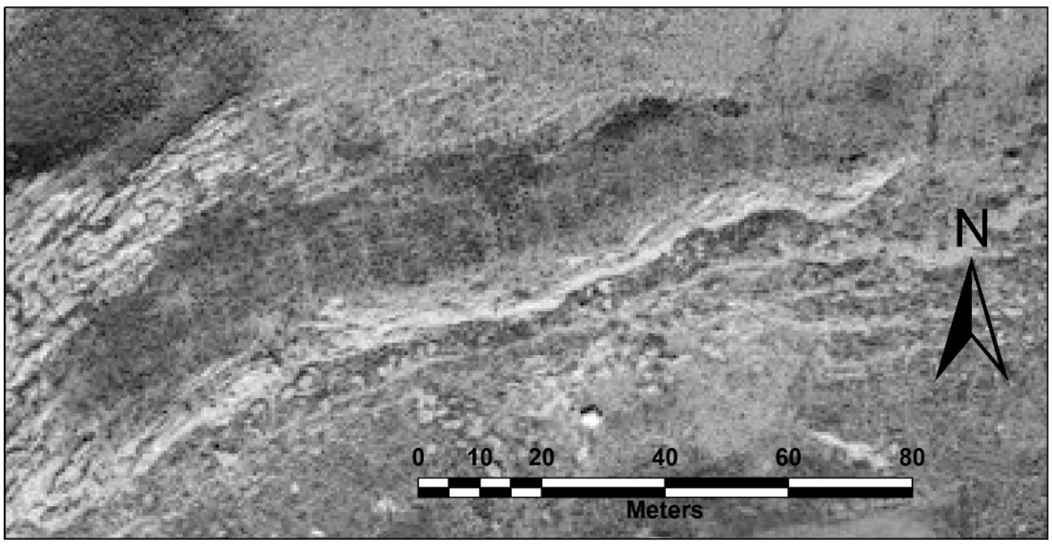
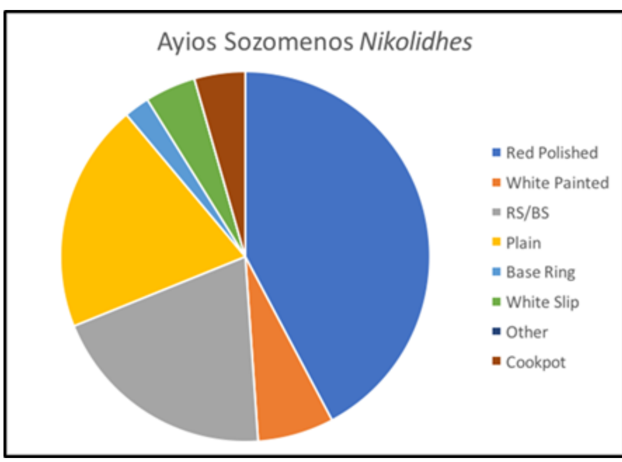


Figure 5.22 - *Detail of southwestern wall at Nikolidhes from 1993 aerial photograph. Subsurface casemate walls are clearly visible (Map based on photograph courtesy of Cyprus Lands and Surveys).*

Despite two seasons of excavation at *Nikolidhes*, and several surveys, this site has the most tenuous dates. Catling collected a few sherds of RPIII, RPIV, and Plain White handmade, while Astrom (SCE IV:1C p.32 n.1) reports in a footnote that he collected White Painted IV-V, RPIV, and PW Handmade, as well as a sherd of Red Lustrous Wheelmade at the site. The 2015 and 2016 surveys and excavations at *Nikolidhes* produced a mere 73 sherds, the majority of which was RP, with some

PW, RS/BS, as well as a few sherds of White Slip and Base Ring, and one Cypriot imitation Late Helladic III cup handle (Figure 5.23). This sample remains too small to allow any conclusions to be drawn on the basis of relative occurrence. The Department of Antiquities excavations in recovered WPVI, WSI, WSII, RS, PW and Helladic material indicating a chronological range that spans LCI and LCII (Pilides 2018b:82). At this time on the basis of the limited material available we may tentatively state that the site was likely founded in the Middle Cypriot, probably MCIII, and there is evidence for use of some kind continuing as late as the end of the LCII. Perhaps the circuit wall was built contemporaneously with *Barsak* and the later use at *Kafkallia*, while the modifications to the circuit wall and construction of the tower date to LCI, contemporaneous with *Vounari* or *Nitovikla*, with which it has compelling parallels that I will discuss in Chapter 6.



73 Total Sherds

19 Red Polished
3 White Painted
9 Red Slip/Black Slip
9 Plain White
1 Base Ring
2 White Slip
2 Cookpot

Figure 5.23 - *Ceramic Wares recovered from surveys of Nikolidhes and 2015 exploratory excavation (excluding 2017-2018 Department of Antiquities Excavation results).*

Agios Sozomenos *Glykia Vrysi*[10]

The fourth of the "fortresses" at Agios Sozomenos, *Glykia Vrysi* is an entirely different type of structure from the other three, as it is a single "blockhouse"-type building, rather than a multi-hectare enclosure (Figure 5.24). However, the mass of its construction, potentially defensive features, and possibly contemporaneous dating validate its inclusion in the coming discussions. It was also the first site excavated on Cyprus to be classified as a fortress. Unfortunately, Gjerstad did not publish the pottery from his excavations, and I was unable to relocate the collection in Sweden.[11] Therefore, as with the other Agios Sozomenos structures, the dates must remain tentative.

It is also important to establish the correct location of the site, which has not been certain for several decades. Fortin (1981:Figures II.1-3) located the fortress in the maps in his dissertation directly south of the center of the *Nikolidhes*

[10] As previously mentioned, Gjerstad (1926) referred to this site by the toponym *Nikolidhes*, which is the actually the name of the promontory on which the large enclosure site of the same name is located. Catling (1962: 155, 161) called the site *Glyka Vrysis-Nikolidhes* and Åström (SCE IV:1C: 30-32) called the site *Nikolidhes-Glyka Vrysis*. The correct spelling of the Cypriot Greek name for the stream is Glykia Vrysi, which the Department of Antiquities has officially assigned the site for all future references.

[11] The collections from Einar Gjerstad's excavations as a PhD student at Uppsala are believed to be held by the Medelhavsmuseet in Stockholm. They are thought to have been exported at the same time as Sweden's share of the finds from the Swedish Cyprus Expedition. However, only a half dozen pieces of groundstone could be located at the museum. I did find three small boxes of material from Gjerstad's 1924 excavations at Alambra, and Lindy Crewe previously found one small box of sherds from *Glykia Vrysi* mixed in with the Medelhavsmuseet's collection from Gjerstad's excavations at *Kalopsidha*, so the remainder of the ceramics may yet be located.

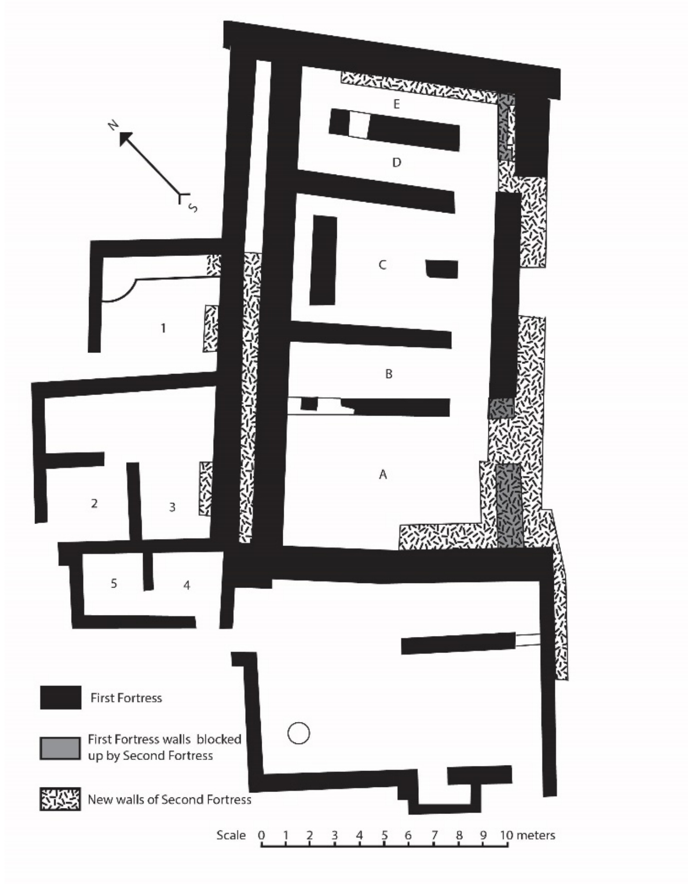


Figure 5.24- *Plan of fort at Glykia Vrysi. (Plan by author, after Gjerstad 1926)*

promontory, although he suggests that the site may also extend to the west.[12] In 1993, Rowe (1995:Appendix 1, no.1; Map 12) surveyed the region and placed the site in the same location, and although she records a larger overall extent for the site, she asserts that Gjerstad's 1924 trench and the foundations of the blockhouse are still visible, but even further east than where it was recorded by Fortin.

[12] The maps from the Cyprus Survey in the collections of the Department of Antiquities have the same location marked, in identical fashion, though whether Fortin based this location on Catling, or if the maps in the DoA collections were prepared later based on Fortin is not clear. Fortin did make a survey of the region with Stuart Swiny in the summer of 1975, before the military blocked access.

In September 2016, ASESP attempted to locate *Glykia Vrysi*. We were certain that we found the larger site, but there was no evidence of a trench or foundations in the eastern locale recorded by Fortin or Rowe. We also found almost no artifacts in these areas. As recorded by Rowe 20 years earlier, that location was heavily disturbed by large scale earth movement in the production of a military firing range, so perhaps the site had simply been destroyed. However, the fields three hundred meters west of that location were full of LCI ceramics, groundstone, and slag. When analyzing the results of the systematic survey collection, a curious gap in the center of the artifact distribution could be seen. When laid over a sequence of historical aerial and satellite images (Figures 5.25-26), the near-empty collection unit that produced that gap falls in the center of a rectangular area defined by an L-shaped wall, which in later decades became field boundaries, and a fragment of another wall parallel to the long leg of the L, that was plowed out of existence in later years. The SW-NE alignment of these walls correlates with Gjerstad's plans. With orthorectification of the images it was possible to measure the approximate lengths of those walls: 32 x 14 m. Gjerstad reports the fortress to be only 19 x 8.3 m, numbers repeated in all subsequent publications that discuss the site, but these dimensions refer only to the interior of the main building. With the massive walls and the large court at one end, the structure measures 31 x 14 m, as confirmed by Gjerstad's own plans.

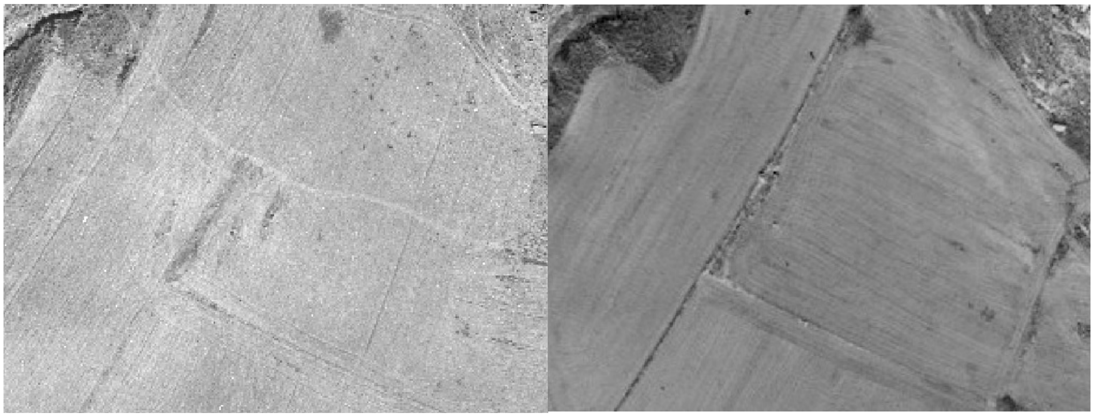


Figure 5.25 - *Detail of 1963 and 1993 aerial photographs of field containing the fort at Glykia Vrysi. 1963 shows the outline of the structure more clearly, but higher resolution in 1993 reveals the NW double wall. (Photographs courtesy of Cyprus Lands and Surveys)*

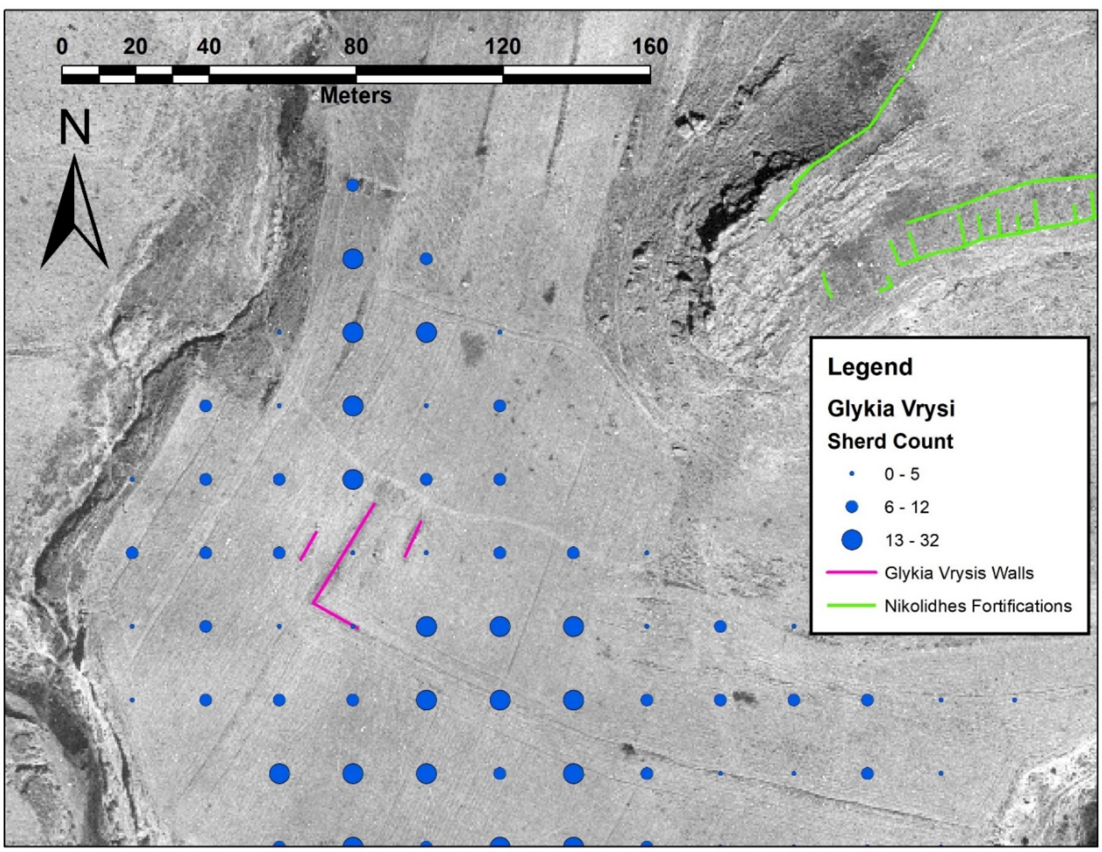


Figure 5.26 - *Map of Glykia Vrysi from 2016 survey results, showing gap where Gjerstad's trenches were likely located, and with walls from 1963 aerial photograph interpreted in pink.*

In the field west of the long wall there is another signature that could be the remains of a wall. This wall runs parallel to the main structure at a distance of 8 m. According to Gjerstad's plan of the site, the structure attached to the west wall of the fort was 8 m wide, and its location in respect to the main building is correct for it to be that wall. Another indication that the true location of Gjerstad's fortress has been correctly identified is an enormous saddle quern ASESP recorded as part of this field boundary during survey. Gjerstad recorded just such quern located in Room 1 (1926:43).

If this were insufficient evidence, there is also Gjerstad's description of the siting of the building adding weight to the argument. Although he provided no maps, in a catalog of known Cypriot prehistoric sites, when describing the greater Agios Sozomenos locale, Gjerstad said,

> A tributary to the river Alikos Potamos runs through a cleft between two hills. To the west of the river on the slope and top of the hill is a necropolis… Some hundred meters further to the west, on the top of the same hill is a settlement from the Early Bronze Age with house foundations, built of unwrought stones, projecting above the thin earth-layer. *To the east of the river is a settlement, where in 1924 I excavated a small fortress.* As the area of the settlement is too small in proportion to the fortifications to have been occupied by a common village, it probably was merely a military station. This gains probability through the fact that also *the hill above the settlement to the right of the river is fortified by a defensive wall and surrounding forts.* (1926:6; emphasis added)

The tributary to which Gjerstad refers is the stream of *Glykia Vrysi*, running through the cleft between the promontories of *Kafkallia* and *Nikolidhes*. He then describes the cemetery and settlement of *Kafkallia* west "of the river," so he is still referring to

Glykia Vrysi. He places his excavations to the east of that river, and below the defensive wall on the hill that is *Nikolidhes*. This description matches the location I propose for the site. He later refers to the "fortifications on the hill north of the settlement" (1926:37), which may be the source of confusion, but which does not preclude the newly proposed location, especially when Gjerstad's description of his excavations is read closely. Although the fort is aligned almost perfectly SW-NE, Gjerstad refers to the walls by the cardinal directions. The wall he calls the north rampart faces NE, and if one were to stand inside the fortand face NE across this wall one would be looking directly at the fortifications of *Nikolidhes* (Figure 5.26).

The NW wall is the most massive and, made of two parallel walls, longest and unsurprisingly the one that survives as a modern field boundary. Each individual wall was over 1 m wide, with a .5-1m wide gap between them, which was subsequently filled with earth and gravel, creating a 2.5-3 m wide unbroken rampart. The other external walls are ~1.3 m wide, and only preserved to 1 m in height (30-40 cm of which were below floor level), so Gjerstad believed they supported plastered mudbrick walls, evinced by a layer of hard clay collapse with plaster fragments. The building had two entrances, both in the long SE wall, one just .7 m wide, and the other, presumably the main entrance at the southwest end, was 1.75 m wide. The interior was divided into 4 spaces by narrow walls, all open at the SE so that no hallway was needed to pass through all the spaces. A free-standing wall in one of the central rooms runs parallel to and only .75 m from the thick NW rampart, which Gjerstad proposes would have supported a wooden staircase to a second floor or the roof. Calculating an inclination of 2:3, and a length of 7.4 meters, Gjerstad also calculates the height of the roof at 4.9 meters.

Glykia Vrysi had two phases of occupation. The first ended in destruction and conflagration, after which the fort was rebuilt on the same plan, but with the southeastern wall strengthened to more than 2 m wide and both entrances blocked up, replaced by a single entrance in the middle of the wall. This second phase appears to have simply been abandoned. With the ceramics unpublished, and the collections unlocatable, I rely on Gjerstad's dates for the site. In the first phase he recorded large numbers of pithoi from the court and rooms external to the fort, BS, WP, and a single sherd of WS. The second phase contained large amounts of BS, a few WP, and BR and WS. In a test trench to deposits below the architecture opened "in the southwest corner of the fortress, Middle Cypriote III pottery (White Painted III-V and Black slip ware) was found in great quantities" (Gjerstad 1926: 46). However, a single sherd of WS found below the floor level near the inside of the Eastern wall lead Gjerstad to assign the construction of the fortress to the LCI. He also saw the destruction, reconstruction, and abandonment of the site all occurring within the LCI. This is possible, but such a final date is based on the absence of Helladic imports and the prevalence of WS and BR in what he reported as a very small sample size. It is therefore possible that the site lasted into the LCII, which is supported by the pottery collected from the Glykia Vrysi locale during the 2016 survey.

Comparanda Site Descriptions

Enkomi Area III – Fortress

Enkomi is a major Late Bronze Age settlement in the eastern Mesaoria plain of Cyprus, located where the Yalias River once met the sea.[13] The settlement is on low ground, below and behind a low ridge that would have blocked the view to and from the sea. Massive city walls, extensive use of ashlar masonry, and formal orthogonal city planning, among many other attributes, have contributed to its identification as the capital of the first "state" on Cyprus, identified with the polity of Alashiya named in contemporary Akkadian sources (Knapp 1985:1996; 2013). However, the majority of the evidence from the site, as with most of the major LC centers, comes from the LCIIC period (ca. 1325-1200 BC) and later. Although the site was extensively excavated prior to 1974, only the Department of Antiquities excavations from 1948-1958, directed by Porphyrios Dikaios (Dikaios 1969-1971), uncovered and published evidence of the LCI occupation. Dikaios excavated two LCI buildings at Enkomi, one in Area I and one in Area III. It is in Levels IA and IB of Area III that the so-called "Fortress" is located (Figure 5.27). Like most of the constructions called fortresses, this identification has been challenged (Fortin 1981:246, 498; Crewe 2007:76). Certainly the building erected in its place in Level IIA (LCIIA, ca. 1425 BCE) is markedly less defensive in character, but the present discussions will be limited to the Level IA building and its Level IB alterations.

[13] The lagoon that served as Enkomi's port silted up, apparently at the end of the Late Bronze Age or early Iron Age, and settlement moved several kilometers further east to Salamis, where river now met the sea (Devilliers 2006).

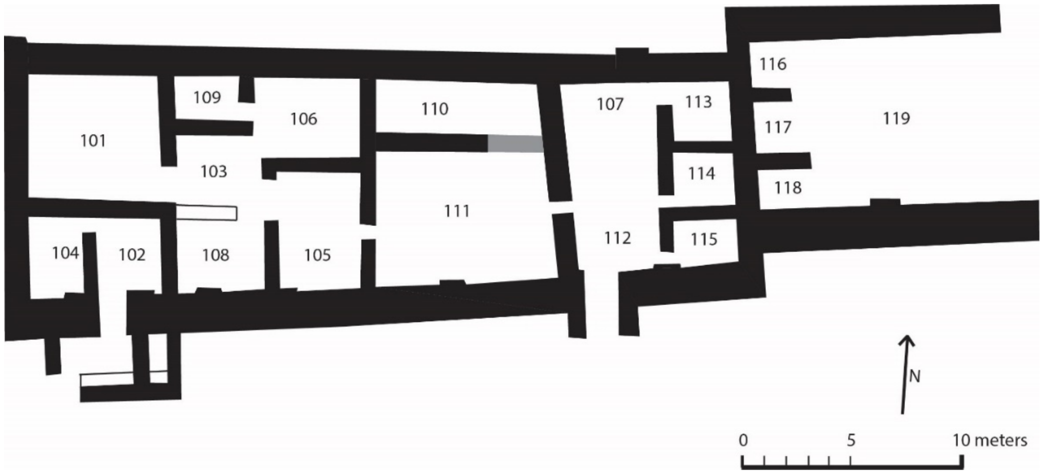


Figure 5.27 - *Level IA Fort, Area III, Enkomi. (Plan by author, after Dikaios 1969-71: Plate 243)*

Area III is located in the far northern sector of the town, adjacent to the city wall. The city wall is a much later construction, probably erected when the orthogonal urban plan was enforced. Prior to the LCIIC, Enkomi, like other late Middle and earlier Late Bronze Age settlements, consisted of discrete buildings surrounded by empty space, rather than the dense urban layout of the latter period. The earliest level, Level A, in Area III consisted of a single wall, which Dikaios believed was part of a building that he assigned to the MCIII, but Crewe is not convinced that this was not contemporaneous with the Level IA building, dated to LCIA.[14]

[14] Dikaios (1969-71:15) called the Level A "building" from Area III the "Pre-Fortress Building" and suggested that it was the predecessor, possibly also a fortress, of the building in Level IA. Fortin (1981:241) does not include it in his list of Bronze Age Cypriot fortifications, because the evidence is too scant. Indeed, the "building" consists of just one wall, with "floors," perhaps more reasonably considered surfaces, partially preserved on both sides. Because of constraints on the area that could be opened,

The Level I building is a large rectangular structure (45 m x 13.3 m), with the long axis running east to west. The massive external walls were preserved in places over 2m in height, allowing Dikaios (1969-71:16) to observe that the lower courses were built of large sandstone fieldstones (ca. .5-.9 m x .4m x .6 m), and upper courses were built with smaller stones (ca. .5 m x .3-.4m x .5 m). The north wall was 1.4 m thick, while the southern wall varied from 1.7–2m, with 6 internal buttresses (1.1-1.4m x .2 m). The east and west walls were only 1.1 m thick, but still substantial compared to that of internal divisions or typical domestic architecture. The fort had two entrances, both in the south wall. The entrance at the western end was protected by a complicated dog-leg structure with a .8 m wide opening, and lead into two rooms. Dikaios reconstructed the dogleg structure and rooms as a tower or towers,[15] though how they articulated with the rest of the building is unclear, and all reconstructions and plans of the building show no passage. Dikaios notes that the northern wall of rooms 102 and 104 was found in a "destroyed state" (1969-1971:17), which may have obscured the former doorway.

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only 10 m of the wall were uncovered. The wall runs east-west, vanishing into the profile in the west, and the east ends roughly in the middle of the open area, just 5 m southwest of the southwestern corner of the Level IA building. This wall is built directly on bedrock, is 1.66 meters wide, and is well-built with large fieldstone facing and smaller rubble-filled interior. Thus, in both dimensions and construction technique this wall matches well with those of the enclosures at Agios Sozomenos. I mention this because Fortin (1981:498) observes the parallels between *Enkomi* and *Glykia Vrysi*, but questions Enkomi's identification as a fortress because it was "so far from any fortified settlements" and "not incorporated into the defensive network." The Level A wall might be part of such a fortified settlement, but without further exposure there is no way to know.

[15] Fortin (1981: 503) gives a detailed argument of why Dikaios' theory of two towers flanking a gate, as seen at Nitovikla, makes little sense at Enkomi.

The entrance at the east end of the southern wall was also elaborated by wall stubs or external buttresses that extended over 1 m out from the curtain wall, creating a short, 1.5 m wide corridor into the building. The structure clearly had a second floor, evinced by the bottom levels of two stone-built staircases, one belonging to Level 1A, and the second apparently added in IB. Although the walls of the building are preserved to a significant height in stone, courses of mudbricks were preserved on the northern external wall, and decomposed mudbrick was found throughout the excavations. The original building preserves 18 internal rooms, and there is an open court, with similar thick northern and southern walls, attached to the east end of the building, although there is no visible access from the court to the interior. The court has no eastern wall, though Dikaios (1969-71:19) suggested it may have collapsed as the bedrock foundation here was very steeply slanted, and Crewe (2007:76) hazards the possibility that it may be the western part of another building altogether.

Level IA, according to Dikaios, ended in a massive destruction, which he saw in the large deposits of rubble and mudbrick collapse in several rooms, and some small evidence for burning prior to brief abandonment (1969-71:21). Crewe (2007:76) challenges this interpretation, suggesting that the damage is likely due to deliberate dismantling rather than largescale systematic destruction. Level IB sees the fortress repaired and partially rebuilt to the same basic plan, and also the first evidence for small-scale copper production. The only significant change beside the second staircase is the construction of a stoa, or roofed colonnade, on the south side between the two entrances, consisting of five column bases for supporting wooden posts, 3m out from the southern wall. Dikaios saw Level IA also ending in destruction, with more widespread evidence for burning and collapse. In the subsequent period, Level IIA, an almost entirely different building was erected in the ruins of the fortress, using the massive outer walls as foundations.

The Enkomi fortress is also without radiocarbon determinations, so chronology is dependent on the ceramic corpus. Adopting the reassessment of the material by Crewe (2007:127), Level IA in Area III contained White Painted, Red Slip/Black Slip, and Red-on-Black/Red. However, it also already contained significant quantities of Plain White, with high proportions of wheelmade Plain White and RS/BS, in addition to the presence of White Slip I, Monochrome, and White Painted Wheelmade, which support Crewe's conclusion of construction late in the LCIA (ca. 1600). An increase in Plain White, especially Wheelmade, Base Ring and White Slip, including the first pieces of Base Ring II and White Slip II, support an LCIB-IIA (ca. 1550-1400) date for Level IB, and occupation ends sometime in the LCIIA.

Korovia *Nitovikla*

The village of Korovia is located 35 km, or roughly halfway, along the Karpass Peninsula in northeastern Cyprus. The site of *Nitovikla* is a steep-sided flat-topped limestone hill about 8 m above sea level, immediately on the south coast of the peninsula, flanked by two crescent sandy beaches (Figure 5.28). The Swedish

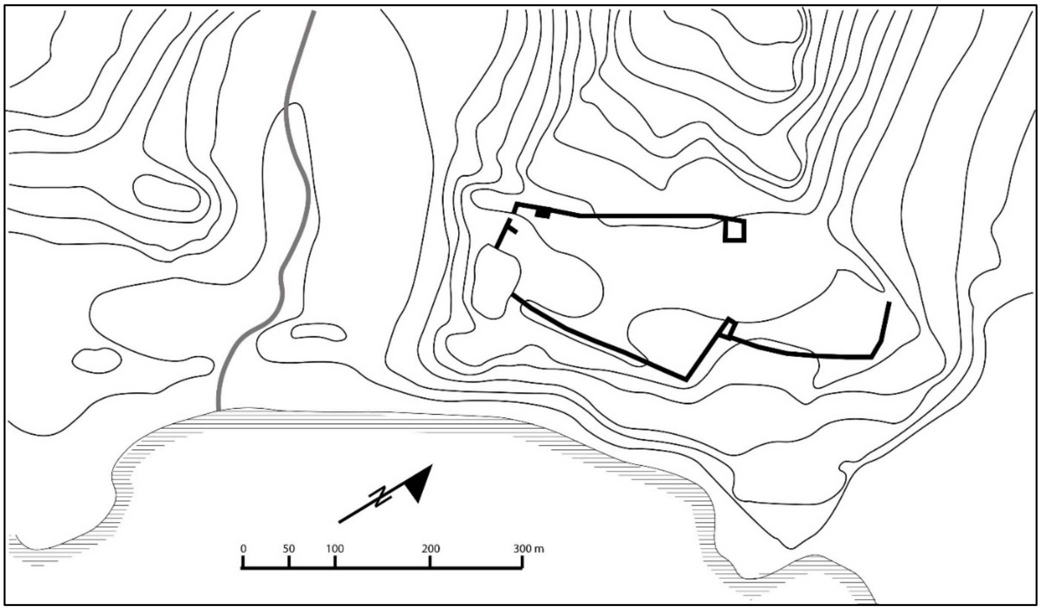


Figure 5.28 - *Plan of the enclosure at Korovia* Nitovikla *(after SCE I, Pl. IV:2). The fort building, western corner, is shown in Figure 5.29.*

Cyprus Expedition, under the direction of Eric Sjökvist (SCE I: XX) excavated a fortress here in 1929. Like all sites in the north, *Nitovikla* has not been visited by archaeologists since 1974, but the ceramics from the Swedish excavations and the chronology were reassessed by Gunnel Hult in 1992 and discussed by Crewe in 2007. Of all the fortresses, this is the one that has never had its defensive character questioned. This is probably because its form evokes traditions of fortification in the Near East and Europe, though what relation it has to those traditions, if any, is uncertain.

The southern extent of the hill is encircled by a roughly rectangular 250m x 100-200m enclosure, reportedly made of very large, rough fieldstone without mortar. However, there is no record of the enclosure wall ever being excavated, so whether this is an accurate description, or is the result of wall collapse is not clear.

The enclosure appears open at the north end, but the opening is flanked by two rectangular structures, likely towers. Outside the eastern tower, a circuit wall continues north for another 150 m before turning sharply west for less than 100 meters before the line of the wall is lost. Inside the outer partial enclosure, the Swedish project recorded a small necropolis, and in the larger enclosure a few suspicious piles of rubble were believed to be the remains of domestic architecture. The main feature of note, and the only one properly excavated, was a heavily built, large square fort in the southwestern most corner of the enclosure. The western wall and a portion of the southern wall of this structure are missing, presumed to have collapsed down the steep hillside, but 50-70% of the structure's floorplan was preserved (Figure 5.29).

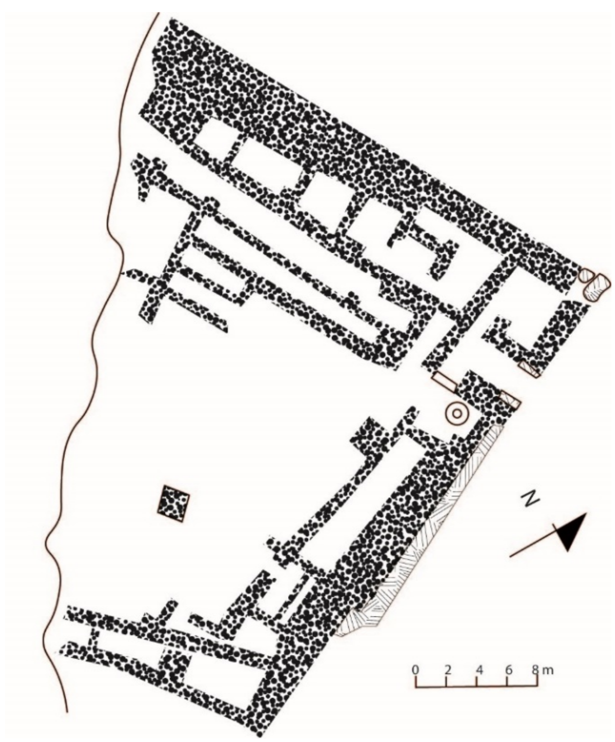


Figure 5.29 - *Plan of Nitovikla Fortress building, located in SW corner of the main enclosure (after SCE I, Fig. II).*

Unfortunately, the Swedish project did not record how this fort structure articulated with the enclosure walls, which could provide evidence for whether it was built before or after the enclosure. The fortress building itself was almost square (40 x 35 m) when complete, and the curtain walls facing the interior of the enclosure are massive, 2.5 - 5 m wide. The northern wall has true casemate rooms built directly into its structure, while both the northern and eastern walls have additional casemate-like rooms built parallel to them. Large numbers of pithos sherds recovered from the rooms in the northern wall suggest they functioned as a storage area (Hult 1992: 75). The southern wall's form is less clear. The portion that does survive suggests that it was more lightly built (perhaps only 1m thick walls), but also had some sort of casemate rooms attached to the interior. Like the structures at Agios Sozomenos, these walls are made of local marine sandstone, likely quarried from the plateau on which the fort is built. The walls are faced with larger stones, possibly roughly shaped, while the cores are small rubble. The excavators recorded no mortar. Astrom reconstructs the height of the casemate rooms to 3 m, and suggests 6 m as the height for the ramparts (SCE IV:1B:5).

The fort building was entered through a gate at the north end of the eastern wall. This entrance is a true gate, flanked by two rooms, and marked by exceptionally large well-cut ashlar orthostats sitting atop ashlar plinths with drafted margins (Hult 1992:16). This is generally believed to be the earliest example of true ashlar attested on Cyprus. The heavy construction of the walls of the rooms flanking the gate led the excavators to reconstruct these two rooms as towers flanking the entrance, reminiscent of a Near Eastern-type migdol tower, despite the anachronism. Passage from the gate to the courtyard is also via a dog-leg. The middle of the structure was a 25 x 20 m courtyard, at the center of which was a 2 m x 2m platform, interpreted as an altar. The fort also contained its own water supply, in the form of a cistern inside one of the rooms adjacent to the gate, and a well inside the outer enclosure (SCE IV:1B:5).

Like several of these structures, *Nitovikla* has evidence for possible destruction episodes. The pre-Fortress Period I, represented only by a lime plaster floor discovered below the fortress courtyard, was covered by a layer of debris and ash, suggesting a possible destruction (SCE I:394; Fortin 1981: 178). Period II (divided into A for the founding and B for later occupation and some remodeling) ends in "catastrophe," after which the walls are quickly repaired and rebuilt, with little remodeling. This second fortress appears peacefully abandoned. The dating of the phases of *Nitovikla* has been the subject of some debate, but the current research accepts the dates argued by Merrillees and Crewe (Table 5.4). It should be noted however that these dates are for the construction of the main fort building, and not for the enclosure wall. Notably, the three tombs excavated by the SCE from within the enclosure at *Nitovikla* date to the MCIII, indicating some sort of occupation of the site preceding the construction of the fort.

		Sjokvist (SCE 1)	Astrom (SCE IV: IC)	Hult (1992)	Merrillees (1994)	Crewe (2007)
Period IIIB	2nd Fortress (end)	LCIB	LCIB	LCIIB	LCIIA/B	LCII
Period IIIA	2nd Fortress (start)	LCIA		LCIIA	LCIB	LCIB
Period IIB	1st Fortress (end)	MCIIIC	LCIA	LCIIA	LCIB	LCIB
Period IIA	1st Fortress (start)	MCIIIB	MCIII end	LCIB-LCIIA	LCIA	LCIA2
Period I	Above Floor			LCIA-B	LCIA	LCIA
Pre-Period I	Below Floor	MCIIIA		LCIA	MCIII	MCIII-LCI

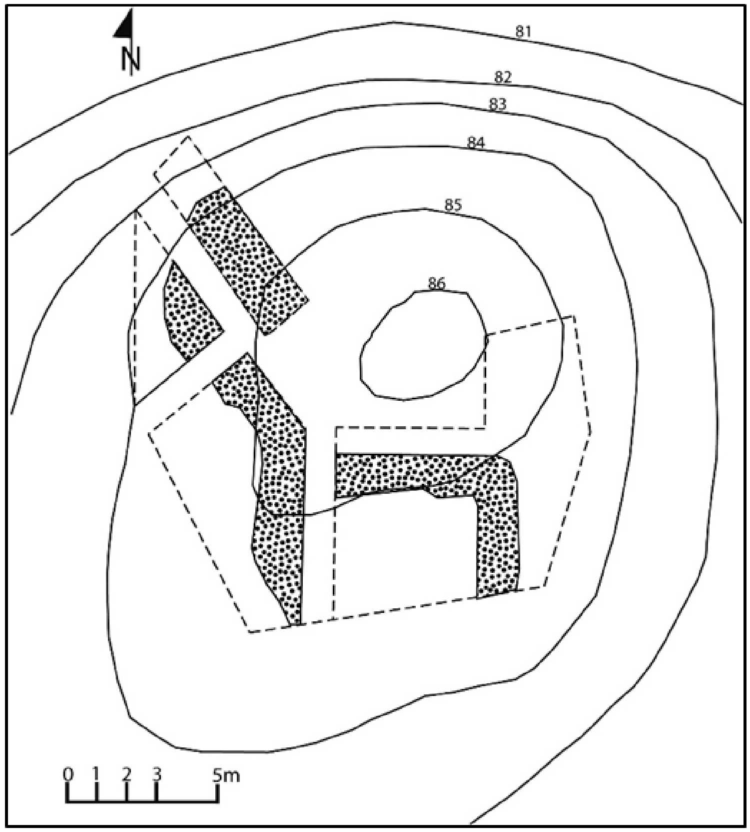
Table 5.4 – Periodization and comparison of published chronologies for Korovia *Nitovikla*.

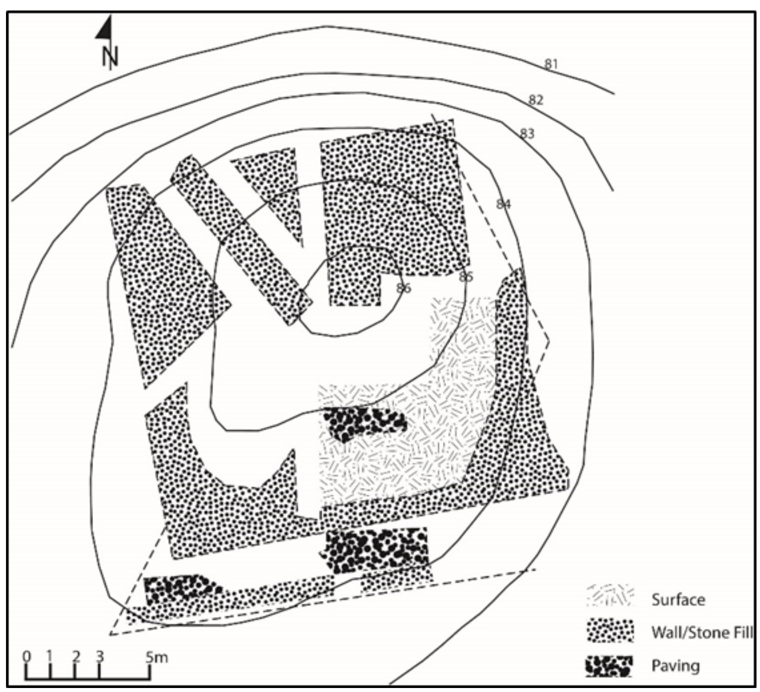
Phlamoudhi *Vounari*

Phlamoudhi is also located in the inaccessible northern portion of Cyprus, at the base of the Karpas peninsula on the north coast. Although the defensive nature of Vounari is questioned, the site of *Vounari* has to be included in these analyses because of its monumental nature and the architectural and chronological relationships with the other sites. What the function of the site was, however, is not so clear. Originally reported as a fortified settlement by the Cyprus Survey (Catling 1963: 168, no 208), the later excavators called it a sanctuary (al-Radi 1983). Fortin (1981: 133-141) included it in his list of Bronze Age fortifications but felt there was insufficient evidence for the designation. Later, Webb (1999:135–140) suggested that it should be considered a defensive structure, but in the most recent and thorough analysis of the stratigraphy and ceramics, Horowitz (2007) sees the site as multifunctional and multivalent, "used for exchange, storage and food consumption… ceremonially mediated economic and political activities acted out on a monumental public space" (2007: 401).

The earliest and most impressive feature at *Vounari* is the hill on which the site is constructed, which reaches a height of 7-10 m above the surrounding landscape, and is roughly 35 m at the base. At the top of the hill, which is at least partially a man-made feature produced by the heaping up of clays (Horowitz 2007; Noller 2008), the first phase of architecture is a single-room 8 x 6 m rectangular building with walls roughly 1.5 m thick (Figure 5.30). The three extant walls are made of large and medium rubble, packed with earth mortar. There are also the remains of a wall about 1.8 m thick that "describe[s] a curved enclosure of the western half of the ancient summit" (Horowitz 2007:157). From the excavation drawings it appears likely that the wall would have encircled the whole summit, creating a round courtyard of 12 m diameter attached to the north wall of the building.

These walls were subsequently pulled down, and a major renovation occurred in the next phase, which saw the construction of a monumental platform (Figure 5.31). Approximately 16 m x 16 m, the platform consists of a well-built "terrace wall" built of roughly dressed fieldstones with green-grey mortar, and filled with rubble and more mortar. The platform is preserved to about 1 m in height, and there was a segment of clay floor preserved on top. A 1 m thick wall runs parallel to the south side of the platform with a 2.2 m gap between them. Later phases (Figure 5.32) saw buttresses added to this platform, and the southern wall is built over with





Figures 5.30 and 5.31 – *Top - Phlamoudhi Vounari Phase 2 (MCIII/LCI) 8 x 6m tower building. Bottom - Phase 3 (LCIA/B) tower and wall (after Horowitz 2007, Fig. 7.2 and 7.3).*

a new wall, 1.2 -1.5 m thick that also encloses the western side of the platform. This wall is built with a distinctive red earth mortar, and the corridor between the wall and platform is widened, filled and leveled, and then plastered.

Horowitz's careful analysis of the stratigraphy and ceramics from the site, and the resulting periodization and chronological assignments are accepted here (Table 5.5). Crewe (2007: 56) uses an LCI date for the Phase 2 building, because of one White Slip I sherd reported by the original investigators, but Horowitz understands this sherd to come from the later use of the building, not its construction.

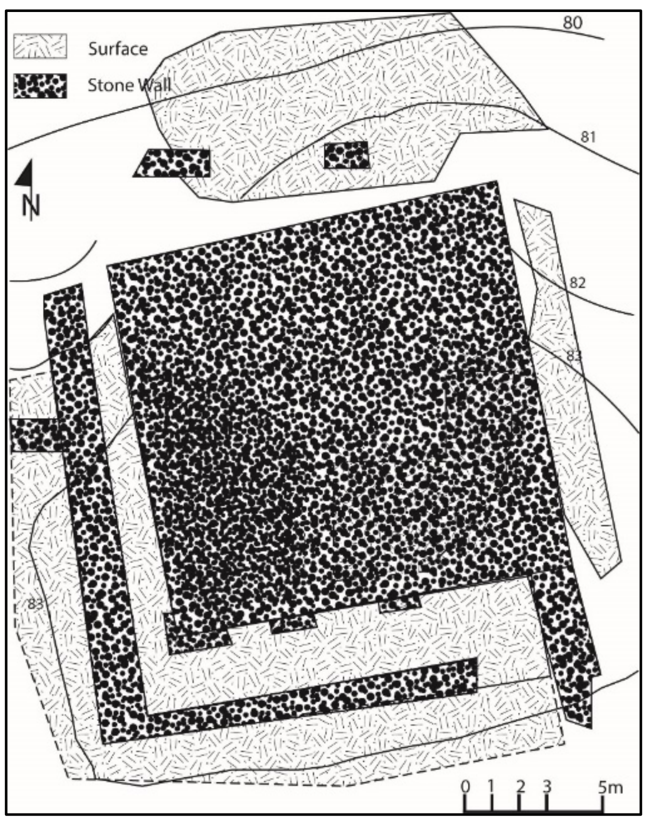


Figure 5.32 - *Phlamoudhi Vounari,- Phase 4/5 (LCI-II) platform/tower with buttresses and walled corridor. (Plan by author, after Horowitz 2007, Fig. 7.4)*

Phase 2	8 x 6 building	MCIII-LCIA
Phase 3	Platform and S. wall	LCIA/B
Phase 4/5	Buttresses and Corridor	LCIB-LCIIA

Table 5.5 - Phasing, architecture, and periodization at Phlamoudhi Vounari (Based on Horowitz 2007).

Chronology Discussion

Although a great deal of ink has been spilled debating the relative chronologies of the fortified sites on Cyprus, the datasets are not robust enough to make detailed arguments concerning the chronological relationships among sites. However, the results of the recent surveys and excavations do allow the proposal of a tentative chronological sequence for the fortresses in the Agios Sozomenos region, and the identification of some broad contemporaneities with other fortifications. First, considering the enclosures at Agios Sozomenos, the present evidence supports a sequence of construction that starts at *Kafkallia*, followed by *Barsak* and *Nikolidhes*. Occupation at *Kafkallia* appears to end first, before the LC even begins, while occupation at *Barsak* continues into LCI, and *Nikolidhes* remains in use into LCII. The blockhouse at *Glykia Vrysi* was primarily occupied during LCI. This sequence suggests that the enclosures at Agios Sozomenos, especially Barsak and Nikolidhes, were roughly contemporaneous with the earliest construction phase at Phlamoudhi. *Barsak* preceded the construction of the forts at Enkomi and *Nitovikla,* which are likely to have been contemporaneous with the fort at *Glykia*

Vrysi and the later tower addition at *Nikolidhes* (Figure 5.33). The tentative nature of these chronological relationships is such that for the Agios Sozomenos enclosures the best that can be said is that *Kafkallia* appears likely to be the first occupied, and *Nikolidhes* the last, and that they may all have briefly been in use simultaneously, sometime in MCIII.

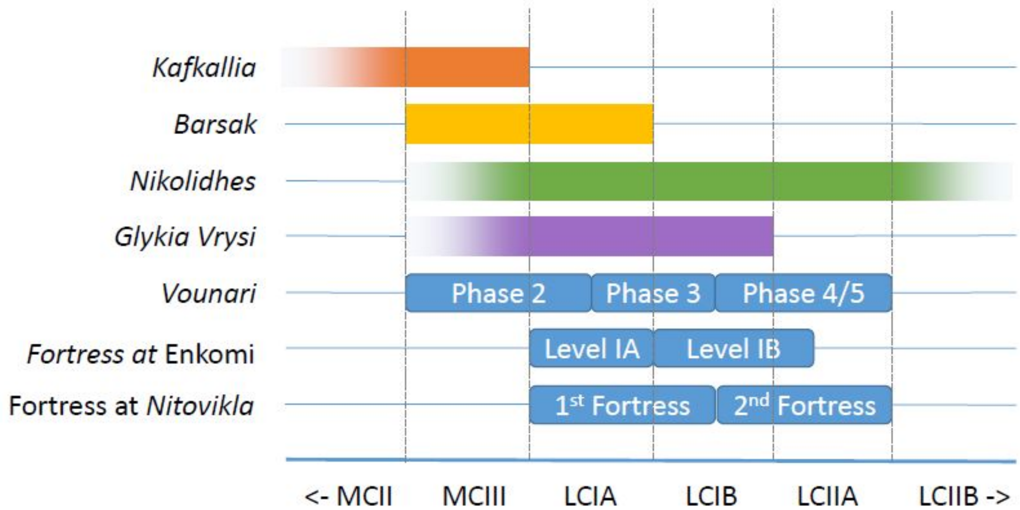


Figure 5.33- *Chronology of fortifications discussed in the text, based on presently available survey and excavation data from Agios Sozomenos, or published dates for comparanda.*

What is clear, however, is that during the transition from the Middle Bronze Age to the Late Bronze Age, Cypriot society was experimenting with entirely new ways of interacting with architecture, with the landscape, and with each other. The sites called fortresses here are not a uniform group, and display so much diversity it is not entirely obvious why they should be investigated together. There are, however, key features that repeat across constructions. First, the scale at which these sites operate is new. The forts, as individual structures, use mass, elevation, and materials in ways different to the domestic buildings of the proceeding 600 years. Second, these buildings and the people who occupied them relate to the landscape in new ways, either taking advantage of local topography, or for the first time manipulating the physical landscape at a not-insignificant scale, in order to achieve particular ends. Third, even if defense were not the only or primary function of these buildings, they all incorporate features that point to a new relationship and concern with violence. And finally, even if the chronologies are not as reliable as we would hope, there are patterns in how these constructions develop, either diachronically within an individual site, or between sites in the landscape as at Agios Sozomenos. These patterns can aid our understanding of how the relationship of societies with violence can change, transforming the active violence of warfare into new forms of coercion and control.

Chapter 6

The Fortress Apparatus: Architectural Affordances and Efficacies

Previous chapters presented the evidence for growing intercommunal violence on Cyprus during the Bronze Age, emphasizing variability in the practice of warfare. It is within this context that the similarly diverse fortified structures were built at the end of the Middle Bronze Age. The materials and design of these structures, massive and distinct from the architectural forms of the residences and workshops known in earlier periods, produced new affordances and defensive capabilities that were undoubtedly intended by the communities that constructed them. However, these new components of the political assemblage did more than afford their builders protection and a sense of security. The same materials and material practices that produced the defensive efficacy of the fortress were capable of generating other effects, some of which may have been "in excess of the human meanings, designs, or purposes they express or serve[d]" (Bennett 2010:20).

This chapter explores the efficacy of Cypriot fortresses, particularly those in the Agios Sozomenos region, at the scale of the individual structure, while the following chapter will investigate their operation within the landscape. Designed to resist attack and defend materials and people, the Bronze Age fortress was a component in a relatively simple form of security apparatus. However, it is my contention that, beyond their function as innovative defensive technology, these structures were also key components in a disciplinary apparatus, working together to collect knowledge of and exercise power over the community and materials they protected to produce a new kind of subjectivity. In this way, defense and discipline are two sides of the same coin, producing within the assemblage the properties of defensibility and docility. By the time the Cypriot fortresses went out of use during the LCII because their defensive capabilities were no longer needed, the effects of the disciplinary landscape that emerged from their operation had already transformed society, having produced new relations of power and domination that would continue to characterize the Late Bronze Age.

This reconfiguration of social relations did not occur immediately, and it is possible to trace some of the process of transformation by observing the diachronic changes in the architecture and material practices associated with the fortresses. First, I consider the characteristics of fortress architecture, namely the affordances of the materials and their configuration, from which the structures' defensive capabilities emerge. These capabilities are the "practical military functions" of the fortifications, which are primarily material or physical efficacies. I then continue to discuss the "symbolic functions" or communicative affordances of fortresses, which are associated with the tactics of monumentality but also contribute to the defensive efficacy of fortresses and their function in the practice of warfare. Next, I present an analysis of the disciplinary techniques operating through fortress architecture and material practices, calling attention to how, through a process of functional overdetermination and strategic elaboration, the configuration and interactions of materials that produce defensive efficacy may operate as a disciplinary apparatus producing docility and political subjectivity.

Security: Defensive Affordances of the Fortress

Fortresses and defensive settlement patterns incorporating fortifications may be the most archaeologically visible evidence for warfare or the threat of war. Ferguson (1997:325) rightly observes that fortifications do not "necessarily indicate actual warfare, as strong defenses may dissuade potential attackers, but they do mean that war is a social reality sufficient to influence behavior." The existence of defensive architecture is evidence of an intent to fortify, to generate new defensive efficacies, but there if more to producing security than just the presence or absence of defensive features. Fortification may be highly variable in the strategies that are adopted and the levels of energy and quantities of materials that are expended, with the configuration of different materials and features producing different affordances. In defense, form follows function, and as Allen and Arkush (Allen and Arkush 2006:7) observe, changes in patterns of fortification or defensive settlement patterning are a reliable indicator of the type, frequency, and scale of war. Thus, while warfare provides important context for these structures and their architectural features, they in turn have the potential to inform our understanding of the nature of conflict.

The construction of fortifications and their continued presence also had effects in the landscape and on society beyond their practical role in internecine conflict. Much debate over the defensive character of European hillforts, for example, has centered on the capability of fortifications to carry and communicate a variety of meanings. Tringham (1972:47) argues that, "the choice to demarcate a settlement when there is no direct threat to the inhabited area or its contents may be the result of the attempt of one settlement to establish an illusion of impregnability and invincibility in the early stages of formation of a political hierarchy of settlements…" When discussing the Neolithic fortification at Carn Brea, Mercer and Legge (1981:67) opined that "it may well be that the structure was deliberately constructed to present an imposing appearance, and was, in effect, a statement of the status of the community that built it." Keeley (Keeley 1996:57) agrees that fortifications possess a great capacity for symbolic communication, transmitting messages of military sophistication, community power and territory, the boundaries and identities of attackers/defenders or owners/usurpers, and the importance and power of leaders, but he correctly observes, "all these symbolic functions derive from and depend on the practical military function of such constructions." Additionally, their effectiveness as a symbol was increased if they actually successfully withstood an attack. Thus, in order to explore fortresses' potential for symbolic communication it is necessary to understand their practical defensive capabilities, and it is a mistake to see fortresses operating in other social or economic capacities or communicating other messages as somehow supplanting their defensive function.

Establishing the defensive capacity of a structure is not entirely straight forward, and indeed, many of the Cypriot fortresses have had their identification as such contested. The large enclosures at Agios Sozomenos have been called "animal enclosures" (Frankel 1974:11; Rowe 1995:64) and the platform at Phlamoudi *Vounari* a cult place (Al-Radi 1983) or a multi-functional monumental ceremonial site (Horowitz 2007). Rather than contest these interpretations, I wish to call attention to the capacity of a building to serve multiple purposes and to carry multiple meanings. For this study I define a fortress simply as a structure that has been fortified, meaning that the structure has features, i.e. particular configurations of materials, that provide specialized defensive possibilities. Thus a fortress can serve any number of other functions in a society, and indeed there are fortified settlements, towers, blockhouses and enclosures that also served as residences, workshops, animal enclosures, and administrative centers. Such peaceful activities in no way preclude the structure's defensive function, although they do give important indications of what the community valued and desired to protect. Only in complex territorial societies would one expect structures to serve an almost exclusively military purpose as frontier outposts (Keeley 1996:58), and even these would likely house domestic activities. Complex assemblages like vernacular architecture are likely to have served multiple purposes and had multiple effects in society, and a single-minded focus on just one functional area runs the risk of diminishing our comprehension of the social power generated by that assemblage's operation.

First, I wish to assess the architectonic features of the structures under consideration that produced defensive affordances. These features are significant because they are innovative new architectural components introduced to the material assemblage of Cypriot Bronze Age society. Cypriot communities built these structures, at least initially, through consensus and voluntary collaboration in response to a pressing need for security in the face of widespread internecine conflict, and particular features were designed or chosen for the specific affordances that they provided the assemblage. Later in this chapter and the next, I will demonstrate that the interactions of these same features also generate the effects of discipline, enabling the transformation of the defensive assemblage into a disciplinary apparatus. In *War Before Civilization,* Keeley (1996:56) provides a list of things fortifications do—that is, the efficacies of the material structures that provide an advantage to defenders during conflict:

- they shield defenders, noncombatants, property and livestock from harm
- they make attackers more vulnerable to defenders' weapons
- they prevent surprise attacks or infiltration
- they force attackers to target specific locations, thus mitigating the advantages of attackers' numbers
- they screen defenders' movements and numbers, providing tactical advantages
- they provide elevated platforms from which to see and fight

This list is a helpful rubric for assessing whether observed architectonic features offered affordances that contributed to the structure's defensive efficacy. However, it should also be noted that fortresses often concentrated wealth and population into a fixed location, thus creating a target and attracting the very violence that they were built to withstand. This unintended consequence of the fortress assemblage could cause increased dependence of the community on the fortresses, leading to further investment and elaboration of the assemblage to mitigate these effects. This feedback loop of entanglement and mutual dependence is a source of the kind of functional over-determination and strategic elaboration that characterizes the operation of a Foucauldian apparatus (see discussion in Chapter 2).

Keeley et al (2007:55) identify three features of fortifications that are unequivocally military in function, meaning they serve no historically or ethnographically attested purpose besides defense: V-sectioned ditches; defended gates; and bastions. These features are also frequently archaeologically visible, meaning that their presence is detectable in plan or subsurface remains, and they are more likely to be preserved and observed. V-sectioned ditches, particularly those backed by an enclosure wall, are impractical for non-defensive purposes but they efficiently expose aggressors to counterattack from atop the wall. Ditches with other cross-sections may still be effective in defense, but may also provide for drainage or other uses. Defensive ditches need not be particularly deep, as demonstrated by

Roman encampments, which used ditches just 1.5m wide and 1m deep, though far larger examples are known from permanent fortifications (Keeley et al. 2007:60–61).

Defended gates are entrances to an enclosure (or building) that protect the defenders, but expose attackers, through the use of baffles or screens to obstruct direct access to the entrance, or by flanking the entrance with towers or bastions. Both types of defended gate (baffled/screened or flanked) create passageways that could be further blocked, but flanked entrances were "commonly used for 'main' gates, probably because compared with baffles and screens, it better accommodated the ever-necessary and incessant peaceable traffic." Defended gates also commonly entered into an inner chamber or courtyard, where presumably those passing through could be screened, or attacked, before being granted access to the main enclosure or building (Keeley et al. 2007:66-67).

The last of these unequivocal features are bastions, or towers, which are "external projections of a barrier large enough to hold several defenders and their fire weapons" (Kelley et al. 2007:68). These bastions strengthen a wall but, depending on their spacing, are expensive in materials and labor to construct. By protruding out from the horizontal plane of the structure's outer surface, a bastion or tower also increases angle of visibility and attack for defenders, which is further increased in the case of a tower by greater elevation.

A key characteristic of all these defensive features is that they do not operate independently, but function only as components of an assemblage that includes some sort of *enceinte*, i.e., an enclosure or curtain wall. It is the affordances that emerge from the interaction of these components that produces their efficacy. A ditch in front of an enceinte effectively makes the defensive enclosure higher, and at a significantly lower labor and material cost than extending the wall. The ditch makes the wall harder to scale and gives the defenders an even greater advantage with their weapons, as the ditch constrains and complicates the attackers' ability to move. Towers and bastions serve to physically strengthen the enclosure wall, while counteracting the limitations to visibility and counterattack imposed by the solid barrier by affording defenders improved sightlines and attack angles outside the wall. Defended gates provide necessary passage through the *enceinte*, while mitigating the risk imposed by a break in the barrier. The enclosure wall itself is an important component of the defensive assemblage (Figure 6.1), and will also be discussed further.

A review of the data from the Agios Sozomenos cluster and comparanda (summarized in Table 6.1), indicates that all of these features appear in Cypriot fortifications, but no single site possesses all three. Additionally, all sites except for the second phase at *Vounari*, whose identification as a fortified site has been debated, appear to possess at least one of these features, although the identification of these features is not always entirely clear. *Barsak* has a particularly unique structure, being the only Cypriot fortress known with a double-enceinte and a defensive enclosure ditch.[1]

[1] Another fortress on Cyprus believed to date to the Middle Bronze Age is reported to have a double enclosure. This site, Krini *Merra,* is located on the southern slopes of the Kyrenia mountain ridge that runs east-west across the northern edge of the island, and

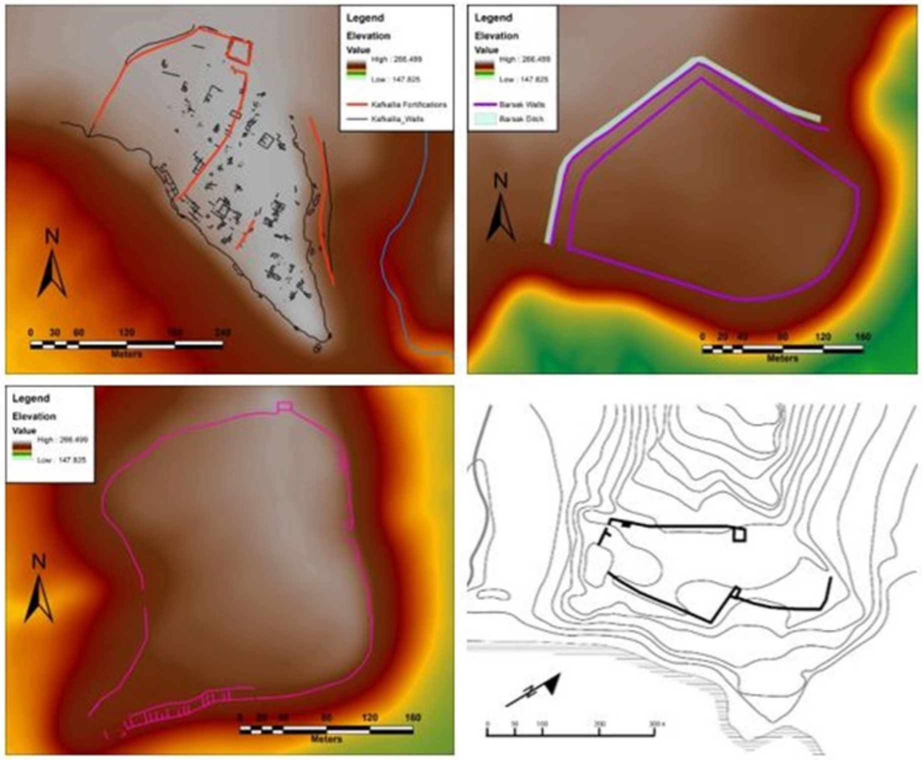


Figure 6.1 - *Plans of the enclosure fortifications at the major fortresses under discussion. Clockwise from top left - Kafkallia, Barsak, Nitovikla, and Niolidhes.*

	Defended Gate	Bastion/ Tower(s)	V-Shaped Ditch	Enclosure
Dhali *Kafkallia*	?	X	---	2
Ag. Soz. *Barsak*	---	---	X	XX
Ag. Soz. *Nikolidhes*	?	X	---	X
Ag. Soz. *Glykia Vrysi*	---	X	---	---
Enkomi Area III Fortress	X	X	---	---
Korovia *Nitovikla*	X	2, 2	---	2
Phlamoudi *Vounari*	---	X	---	?

Table 6.1 - Specialized defensive features at Cypriot BA fortresses. “X” indicates presence, and “?” indicates possible presence. Nitovikla has 2 towers on the fort building, and 2 on the enclosure wall.

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was never systematically surveyed or excavated. The sketch plan of the site produced by Michel Fortin (1981: Figure V.5), confirmed by satellite photography, shows a set of 7 regularly spaced and heavily-built bastions attached to the exterior of a heavy outer wall, with a narrower unelaborated inner wall. Alas, little more can be said until political conditions change to allow archaeological research to return to the north.

All of the fortresses under consideration have a bastion or tower-like structure, with the exception of *Barsak*. *Nikolidhes* has the only feature that resembles a proper bastion by Keeley et al's definition, as the bastion/tower in the northeast projects outwards from the enceinte (Keeley et al. 2007:67). This structure was a solid platform, suited to supporting multiple armed combatants. Moreover, it seems likely that this structure could have held additional architecture on top, and flanked an entrance to the site, but this has not been confirmed. The earlier phase 2 structure at *Vounari* appears to have been a smaller tower/enclosure assemblage atop the artificial mound, with tower walls extending outwards from the small enclosure wall. The square platform of the later phases (3-5) at *Vounari*, like the platform at *Nikolidhes*, may also have supported additional architecture, but this platform was not attached to an enclosure wall. It may have been surrounded by one, but the configuration is not one suited to defense, as was previously concluded by Horowitz (2007). At *Kafkallia,* likely the earliest of the Agios Sozomenos fortresses (see Chapter 5 for detailed descriptions and tentative dating of the sites), the large (25 m x 25m) structure inside the northeastern corner of the U-shaped enclosure is identified as a tower due to its thick walls. This structure was likely adjacent to one or, even two entrances to the enclosure. This tower would also have commanded a view over the entrance to the village on the escarpment (see Chapter 7 for a discussion of routes to the sites). The large size and open interior of the tower's structure, and its location inside the enclosure wall complicates interpretation. Peltenburg (2008) thought it might be similar to the courtyard-blockhouse at *Nitovikla*, but unlike *Nitovikla*, *Kafkallia's* heavily-built square building has no visible internal divisions or evidence for casemate rooms. However, the >3 m thick wall footings could have supported very high walls, the tops of which would have served well as a platform for defenders if the interior of this structure were open. If this area were partially roofed, even more space would have been available.

Nitovikla, the largest of the fortresses on the Karpass peninsula, has two sets of towers. The first are a pair of bastions incorporated into the *enceinte*, and like the courtyard/tower at *Kafkallia*, are attached to the interior of the enclosure wall on either side of what appears to have been a wide passage between the inner and outer enclosures of the site. Although the publications of the Swedish Cyprus Expedition provide no measurements of these structures, the excavator Erik Sjökvist (SCE I: 371) refers to them as "a large, square bastion, now completely ruined" and "an other[sic] equally large," and the rough sketch plan in the publication (Plan IV, 2) suggests that these structures could have been as large or larger than 20 meters on a side, making them quite comparable to the bastion at *Kafkallia*. The Swedish excavators also believed that the heavy, protruding walls of the rooms surrounding the entrance to the main fortress-building supported a pair of towers, with the rooms inside the corner acting as chambers flanking a gate, with an off-set entrance (Figure 6.2).

The two blockhouse forts in this study, *Glykia Vrysi* at Agios Sozomenos and Enkomi on the east coast, may also have had tower-like features integrated in their

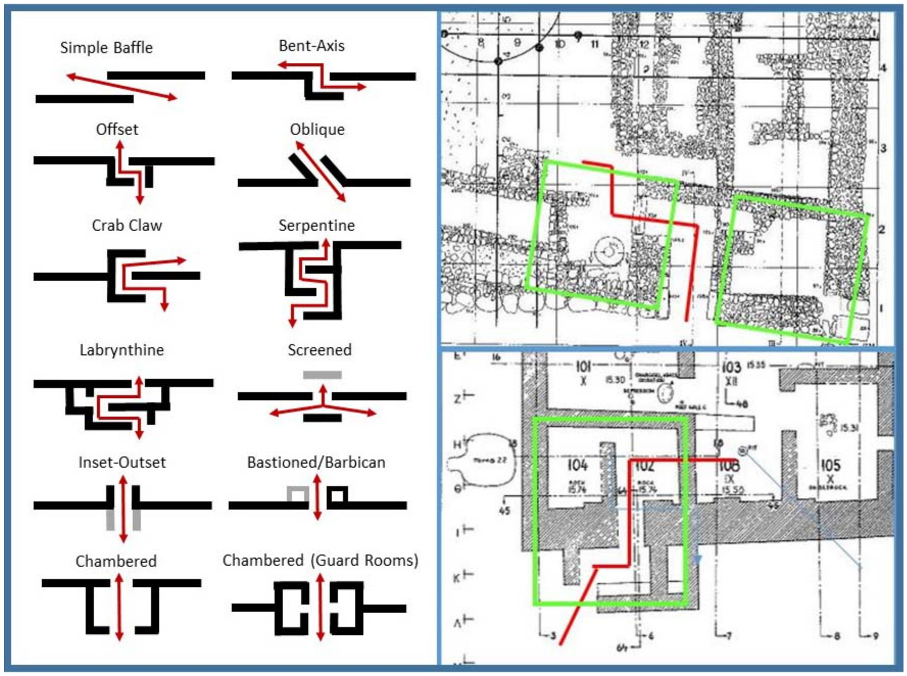

Figure 6.2 - *Defensive gate configurations. Left - schematics of different defensive gate configurations (after Keeley et al. 2007, Fig. 1). Top Right - entrance to Nitovikla fort. Bottom Right - entrance to Enkomi fort. Towers proposed by excavators oulined in Green. Red marks the offset entrance routes, passing potential defensive chambers.*

design. Dikaios believed that the square configuration of rooms partially protruding from the southwest corner of the fortress at Enkomi was a gate flanked by chambers and towers, similar to that at *Nitovikla*. This seems unlikely as the entrance to the Enkomi fort was not 'flanked' by rooms, but passed through them. The whole configuration makes more sense as a single tower through which the gate passed, in a configuration similar to a Medieval barbican gate (Figure 6.3). The entrance route also follows a narrow dog-leg path, with one room that could have served as an ante- or guard chamber, a highly-defensible arrangement (Keeley et al. 2007:62-67). The eastern entrance to the fort is flanked by heavy protruding walls

Figure 6.3 - *A barbican gate through a watchtower at The Rock of Dunamase, Co. Laois, Ireland. Image copyright CC-BY-SA-4.0, Wikimedia Commons user Reuben 1.*

that would have provided some additional defensive capability to the entrance. The entrances into the main building at main *Glykia Vrysi* in contrast appear to lack any defensive features. Instead there is a rectangular structure that protrudes from the outer wall of the courtyard attached to the southwest end of the building (Figure 5.22). The interior of the structure is a 1m x 2m space barely the size of a broom closet, but with a bent-axis entrance that would obscure what was kept inside. This would be an ideal configuration to contain a ladder leading up to a platform that overlooked both the main entrance to the courtyard and the courtyard interior. Supporting the identification of this rectangular structure as a tower, there is also a buttress that would provide extra structural support to an architectural feature intended to support more weight.

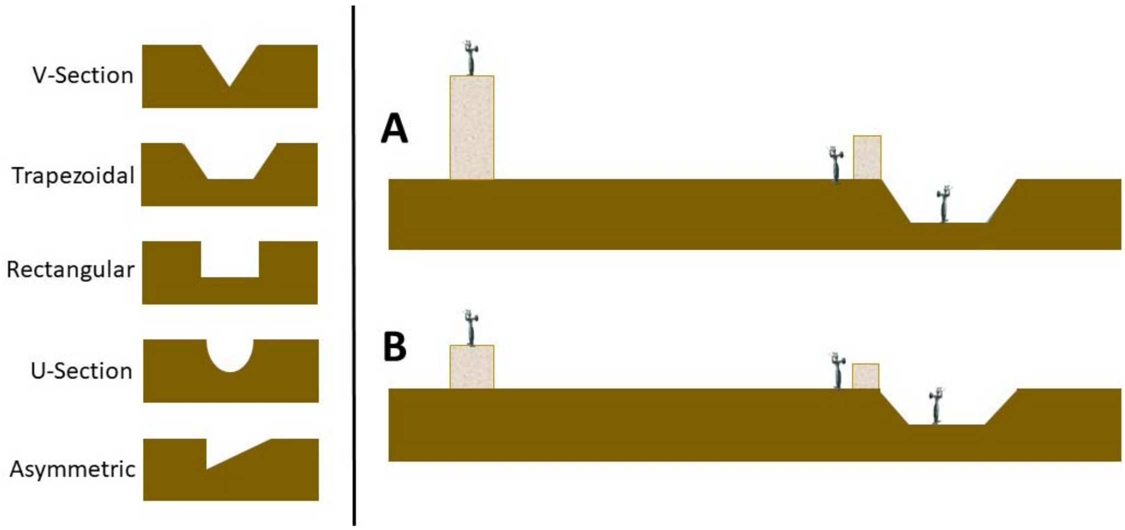

Figure 6.4 - *Left – Schematic ditch profiles, adapted from Keeley 2007. Right - Schematic profile reconstructions of Barsak fortifications. Based on excavation results and satellite data, the "killing field" is 17m wide, inner wall 2m wide and ditch 5 m wide. (A) – "Maximalist" = Inner wall reconstructed as 5m high, outer wall 1.5 m wide and 2m high, ditch 2m deep with 60 degree sides. (B) "Minimalist" = Inner wall reconstructed as 2 m high, outer wall 1m high and wide, ditch 1.5m deep with 45 degree sides.*

The third of Keeley's universal defensive features are enclosure ditches with a V-shaped profile (Figure 6.4). Enclosure ditches like that discovered at *Barsak* by the investigations of ASESP are otherwise unattested during the Bronze Age on Cyprus. Unfortunately, the full depth and width of the *Barsak* ditch remains uncertain, but it was at least 1.5 m deep as determined through excavation, and soil drainage patterns visible in aerial photography suggest it may have been more than 4 meters wide. Without full excavation it is not clear what shape the profile of the ditch is, but as Keeley observes, V-shaped ditches are suited *only* for defensive purposes. Other ditch profiles have defensive affordances while simultaneously being capable of serving other purposes. The ditch at *Barsak* almost certainly served as a drainage ditch, directing water away from the bases of the walls and off the cliff. The defensive affordances of this particular ditch are also increased by the interactions of a specific assemblage of architectural features that *Barsak* possesses, namely a double enclosure wall. As a ditch immediately at the foot of a wall effectively increases that wall's height, the outer enceinte at *Barsak* could have been not very tall, perhaps only a little over a meter, and would still have served as an effective barrier. This would reduce the cost of construction, and would potentially allow defenders to stand behind, instead of on top of, the wall while still being able to survey the surroundings and wield weapons. With a lower outer enclosure wall, defenders atop the far heavier and presumably higher, inner enceinte would also potentially be able to see and fire weapons such as slings, spears or arrows over the outer enceinte. Finally, if the defenders fell back to the inner enceinte, the outer wall would become an obstacle to attackers who had successfully scaled the ditch and it, trapping them between the inner and outer enceinte in a sort of "killing field," a wide stretch of open ground with no cover from defenders' view or weapons. Although Keeley observes that sometimes a wall is just a wall, a double wall and ditch is undoubtedly a configuration assembled for optimal defensive efficacy.

There are other architectural features that may enhance defensive capabilities, but are not exclusively related to defensive function. Primary among these is the *enceinte* itself. These barriers block physical and visual access to a space, affordances beneficial for defensive purposes, but as has frequently been argued, enclosure walls can also be built to provide privacy or otherwise separate people, contain livestock, serve as terrace walls, or even act as windbreaks, not to mention conveying a multitude of symbolic messages, among which are identity and group association with place. V-shaped ditches, defended gates, and bastions are all features associated with *enceintes* that clearly point to a defensive purpose for the overall structure, but it may otherwise be difficult to interpret whether enclosure walls were intended as fortifications.

Following Jarriel (2017:121), I suggest that walls significantly thicker than those of contemporaneous domestic architecture may be reasonably assumed to have been intended for defensive purposes. Walls built specifically for use in non-violent contexts would not require thicker or taller walls in order to generate their desired effects, but the affordances of additional height or width in a wall are particularly efficacious in defense: they strengthen the wall against destruction, and protect whatever is behind the wall from harm; walls wide enough for humans to stand or walk atop provide defenders with greater views of the landscape, thus potentially providing advance warning of attack and improving knowledge of enemy movement during combat; additional height improves the efficacy of defenders weapons, particularly thrown or missile weapons, while diminishing the efficacy of the weapons of attackers who may not reach, or see, their targets. The identification of these walls as terrace walls is rejected because of the thickness, but also the construction techniques, as all of these walls have two well-built faces, often with a distinct central core of stones and soil fill. Terrace walls typically only have one well-built face, facing downslope.

	Chronology	Internal Walls (cm)	External Walls (cm)
Sotira *Kaminoudhia*	ECI-III	40-70	55-100
Marki *Alonia*	ECI-MCII	40-100	N/A
Politiko *Troullia*	ECIII-MCIII	50-70	N/A
Ambelikou *Aletri*	MCI-II	50-70	N/A
Erimi *Laonin tou Porakou*	MCI-III	40-50	ca. 60
Alambra *Mouttes*	MCII	50-80	N/A
Alambra (Gjerstad)	MCII	60-85	N/A
Agios Sozomenos *Kafkallia*	MCII-III	30-50	50-60
Kalopsidha	MCIII	ca. 45	N/A
Enkomi Area I	LCI-II	60-80	N/A
Agios Sozomenos *Ampelia-Djirpoulos*	LCI	62-65	N/A
	AVERAGE:	59.6	64.33

Table 6.2 - *Wall widths from Domestic/workshop buildings at Early and Middle Bronze Age settlements. When internal and external walls were not differentiated by the excavators the range of widths is recorded as internal.*

Table 6.2 summarizes the widths of the walls from published domestic and workshop architecture at various Early and Middle Bronze Age sites discussed in earlier chapters, and the LCI buildings from Area I at Enkomi (Dikaios 1969-71:154) and at Agios Sozomenos *Ampelia-Djirpoulos* (Pilides 2016)[2]. The average wall thickness of sites occupied in the MCIII-LCI is approximately 55 cm, but I use 60 cm as the baseline for my calculations, as this is the average size of all the ECI-LCI walls. 60 cm is also the thickness of the heavier domestic walls at *Kafkallia,* Politiko

[2] The 2016 ASESP press release discusses two walls, one 62 cm wide and one 65 cm wide, as part of the large Höfhaus structure excavated at *Ampelia-Djirpoulos*. However, it is not clear whether these are exemplary or unusual, and this building is significantly larger than the typical individual domestic structure of the MCII or MCIII.

Troullia, and Erimi *Laonin tou Porakou*, settlements all occupied during the MCIII, the period when the enclosures at most of the fortresses are most likely to have been built, and therefore the best comparanda. A wall twice the thickness of these domestic walls would span 1.2 meters, a size that might reasonably possess the necessary strength and stability to stand freely over 2 meters in height.[3] Higher walls are more difficult to scale, and thicker walls more difficult to destroy. Walls three times as thick (>1.8 m) are wide enough to comfortably and safely stand and walk atop, and those more than four times as wide (>2.5 m) could effectively act as combat platforms for multiple defenders. Table 6.3 presents the width of the major enclosure walls at the study sites, and expresses their width as a ratio of typical, larger domestic walls.

The results show that all of the sites incorporate enclosure walls of unusual thickness that likely were intended for defensive capabilities. The widest walls are those of the fortified buildings at *Glykia Vrysi*, Enkomi, *Kafkallia*, and *Nitovikla*. At *Nitovikla* the thickest walls of the blockhouse face exceeded 4 m, and encased casemate rooms surrounding a courtyard, which likely provided access to the roofs

[3] Reliable published data for mudbrick construction is difficult to obtain, and construction techniques and materials vary greatly around the world, but mudbrick construction is still used in rural Cyprus today and provides some indications of the material's limitations and affordances. During the summer of 2015, as a member of the Politiko *Troullia* excavations, I watched the construction of a ~10 m x 20 m unroofed courtyard in the village of Pera Orinis, built with mudbrick walls on limestone and river cobble footings. These footings were somewhat less than 1 m high and the final wall was over 2 m high, capped with fired ceramic tiles to shed rain. The walls were less than 50 cm thick.

	Wall	Width (m)	Ratio
Dhali *Kafkallia*	North & West	1.6	2.7
	South/Inner	1.2	2.0
	Tower	2.9	4.8
Ag. Soz. *Barsak*	Outer Plateau	0.7	1.2
	Inner Plateau	1.9	3.2
	Cliff	1.8	3.0
Ag. Soz. *Nikolidhes*	Original	2	3.3
	Remodel	1.8	3.0
	Bastion Join	3.2	5.3
Ag. Soz. *Glykia Vrysi*	Northwest	2.7	4.5
	External	1.3	2.2
	SE Remodel	2	3.3
	Courtyard	0.7	1.2
Enkomi - Area III Fortress	North	1.4	2.3
	South	1.9	3.2
	E/W	1.1	1.8
	Courtyard	1.8	3.0
Korovia *Nitovikla*	Blockhouse	2.5	4.2
Phlamoudi *Vounari*	Phase 2 Tower	1.5	2.5
	Phase 2 Enclosure	1.8	3.0
	Phase 3 Wall	1	1.7
	Phase 4/5 Wall	1.4	2.3

Table 6.3 - Ratio of widths of potential defensive walls to the width (0.6 m) of domestic architecture at Kafkallia and Erimi. Green > 2x, Yellow > 3x, Red > 4x.

and tops of the walls. At *Glykia Vrysi*, the northwestern rampart was unusually strong. The construction method of this wall, effectively two parallel walls over 1m wide, with the gap filled with stones and soil, produced a strong platform that may easily have extended above the height of the main structure's roof. *Glykia Vrysi*'s southeastern wall on the other hand was only 1m wide during the first phase of the site. It is telling that when the building was repaired following a destruction episode, this width of this wall more than doubled in width, and reinforcing thickness was added to much of the southwest and northeastern walls as well. The courtyard at *Glykia Vrysi* has comparatively narrow walls, but the courtyard was overseen, as previously mentioned, by a tower on its southwest side. The Area III fortress at Enkomi, which provides many structural parallels for *Glykia Vrysi*, has no such tower, but the courtyard walls were wide enough for people to stand and move. Though it appears neither site had direct access between the courtyard and the building interior, enclosing and protecting that exterior courtyard space still a priority justifying additional investment. The blockhouse or tower structure at *Kafkallia* has no evidence for roofing, so it may have been simply an enclosed courtyard, but like the other buildings discussed here surveillance of both the interior and exterior of the structure would have been afforded by the massive walls.

The thickness of the enceinte walls, and the elaboration of those walls through towers protecting entrances to the sites of *Kafkallia* and *Nikolidhes*, and in the case of *Barsak* an elaborate double wall-and-ditch enclosure system, all indicate that the three massive enclosures atop the Agios Sozomenos plateau were built for the purpose of defense. *Kafkallia's* defenses appear the most ad hoc, added as needed to secure the growing village on the promontory. *Barsak's* defenses are the most elaborate, a sequence of envelopes that would provide defenders a tremendous advantage against any attack or encroachment. The lack of architecture within, however, suggests that the defensive efficacy was used only as-needed, as a refuge for communities that lived elsewhere. The large open enclosure would have served well as an animal stockade, providing protection on a more regular basis to the Bronze Age Cypriots' most valuable possessions – their livestock. *Nikolidhes* also lacks any evidence for settlement, but its own architectural elaborations in the form of a sequence of highly regimented casemate rooms also points to possible use as a refuge, while providing ongoing protection of livestock and other movable goods. The architectural features that provided physical defense of people and their belongings had other material effects too, and these are explored next.

Monumentality: Social Organization and Communication

One architectonic trait that may play an important role in both the defensive and political efficacy of a structure is monumentality. Bruce Trigger (1990:119) defines a building as monumental when the "scale and elaboration exceed the requirements of any practical functions that a building is intended to perform." Egalitarian societies mostly adhere to a principle of least effort, so the conspicuous consumption of energy beyond the least necessary was a display of the ability to generate and expend such energy, and therefore effectively a display of power (Trigger 1990:125, after Veblen 1899). This "Thermodynamic Approach" to monumentality views monumental architecture as the conspicuous consumption of energy and therefore a display of political power: the larger the building, the more powerful the society, or the leaders of that society.

This approach, however, has been criticized as overly reductive (e.g. Osborne 2014:6). How large is large enough? Are there other aspects of a building that contribute to the sense of monumentality? And what defines "requirements of a practical function"? For fortresses this definition is particularly problematic, as the large scale of many defensive structures might be necessary for their practical function, for example protecting an entire village, or large herds of livestock. Indeed, Trigger (Trigger 1990:122; citing Adams 1977:187; Moseley and Day 1982:65) argues that fortresses in early civilizations frequently do exceed the scale and elaboration needed for "practical defensive considerations." However, this justification is unnecessary. Monumentality, as a measure of the conspicuous consumption of energy, is power made visible and material. Control of energy is thus a measure of political power, but the assertion that this energy must be "beyond practical function" presupposes the viewers' ability to assess what is necessary and that "necessity" defines and limits monumental efficacy. Just as having other symbolic or economic functions does not detract from the defensive efficacy of a fortress, it is not clear that an efficiently scaled fortress would not still possess the efficacy of monumentality.

An alternative and more nuanced definition is provided by Osborne (2014:3) who argues that monumentality is inherently a relational property, "an ongoing, constantly negotiated relationship between thing and person." A monument, on the other hand, is a thing that *reminds* (from the Latin, 'monēre'), which means that it communicates meaning to the person experiencing it. Monumentality is thus a measure of how efficacious a building or object is at conveying meaning. The meaning can be explicit and culturally specific, like a tombstone or a statue commemorating a battle, or implicit and generalizable, such as scale or craftsmanship communicating power or wealth. The meaning of a monument can also be implicated in the production and reproduction of social relations and behaviors. Antonio Gramsci's concept of cultural hegemony supports this understanding of monumentality: rather than dominating exclusively through coercion, dominant groups obtain the consent of subordinant groups by imposing their ideological world view (Gramsci 1971:12). Monumental architecture is one tool through which this may be achieved.

The size and strength of fortifications or other monumental constructions has frequently been correlated with the social scale and complexity of the community that built them (e.g. Trigger 1990; Childe 1950; Pollock 1999:174–178). Larger polities with stronger rulers are presumed to be able to compel larger forces of corvée labor to participate in construction projects (Arkush 2011:67). However, this direct link between hierarchical sociopolitical complexity and monumentality, like the link between scale and monumentality on which it is based, is overly reductive. Scholars (e.g. Pauketat 2000; Notroff et al. 2014) have observed that social groups organized by heterarchical or egalitarian relations are also capable of completing large-scale construction projects through collaboration and consensus. While the size of a structure alone may not indicate the complexity of the social organization responsible for its production, the design and elaboration of space may be better indicators, as competing agents or groups will design and build environments that negotiate and reproduce their sociopolitical status (Smith 2003; Fisher 2007).

These different views encourage a more nuanced and contextualized approach to assessing a structure's monumentality and the meaning that monumentality conveys, but the social and cultural significance of large scale construction projects should not be discounted. Their novelty and scale would undoubtedly have had quite the effect on those who participated in their construction and those who saw or experienced them (Rapoport 1990:116). Their scale would have allowed the structures to be viewed, and thus negotiate their messages, over great distances and with large numbers of people (a point explored further in Chapter 7). The scale of the negotiations fortresses could participate in is important to understanding their contingent outcomes, as relationships between monuments and hundreds or thousands of individuals generate more significant efficacies, and more likely to produce structural change, than relationships with just a few (Pauketat 2000:116-7). Among the messages fortresses conveyed would have been the defensive efficacy of the structures. Impregnable high walls, some with towers or bastions, would have been a source of security and comfort to members of the group that built or had access to the structure. To those who sought access without permission, to raid or steal, the walls were simultaneously a warning that access would not come easily, and possibly at a cost they were unwilling to pay. The groups that built these structures would also be defined and united by their shared experience and investment of labor, so in turn the structure would remind them of their identity as a member of those groups (e.g. Caraher 2014; Notroff et al. 2014). The structure, once built, would be a feature of the local landscape that would, "associate a group with a place and represent the power and authority of its leaders… often expressing relatively unambiguous messages of power" (DeMarrais et al. 1996:18).

Were the fortresses of Agios Sozomenos monumental, and what meanings might they have had for those who built them and those who encountered them? Quantifying the labor involved in the construction of the fortifications allows comparison of the investment required. To assess this, I used architectural energetics to calculate labor estimates for the various sites' construction, quantifying the volumes of different materials and building techniques and multiplying them by labor estimates for the various tasks required in their construction. Combining these labor estimates with local population size estimates provides as estimate for how long the construction construction project would have taken. Projects that greatly outstrip a reasonable estimate of available labor may indicate that multiple communities collaborated, either voluntarily or through coercion, in the construction, or a monumental structure might be completed by the available labor of one village over an extended number of years between more agriculturally demanding seasons. This analysis takes inspiration from Trigger's thermodynamic approach to monumentality, but heeding Pauketat's critique that egalitarian societies are capable of monumental construction, I also view monumentality as relative and as the product of the scale of social interaction during construction, and not exclusively the product of elaboration or elite coercion.

Generally for these calculations I used the methodology developed by Abrams (1994) in his study of the architectural energetics of the Maya. Abrams divides the process of building into 4 main tasks: Procurement (of raw materials), Transportation (to the construction site), Manufacture (of materials such as mudbrick, ashlar blocks, or wooden frames), and Construction. Each task has formulas, based on ethnographic analogy or historic documentation, for particular materials and methods and the volume of the material being used. In seeking better estimates for the particular materials, techniques, and conditions of construction that would have been present in Bronze Age Cyprus, I used labor estimates adopted by Maud Devolder (2013) in her study of the energetics of Neopalatial Minoan architecture. One exception is in the calculation of the construction task for the earthen/rubble fill of the large platforms at *Nikolidhes* and *Phlamoudi*, for which I returned to Abrams' estimates (1994:44, Table 3).

Summary of the results of architectural energetics calculations for the case study sites are shown in Table 6.4. Calculations were not prepared for Glykia Vrysi or the fortress at Enkomi, because while still comparatively large buildings, they do not compare in scale or visibility to the large enclosures. For comparison, however, I completed calculations of the constructions costs for a large (11m x 13m) freestanding domestic structure from *Kafkallia*, including the cost of timber frame and earth roofing, which appear as the last item in Table 6.4. The Swedish Cyprus

	FEATURE	PERSON HOURS	8-HOUR PERSON-DAYS	5-HOUR PERSON-DAYS
KAFKALLIA	East/Inner	13594	1699.25	2718.8
	Northwest/Outer	20625	2578.125	4125
	Tower/Blockhouse	17555	2194.375	3511
	Lower Wall	16983	2122.875	3396.6
	TOTAL:	68757	8594.625	13751.4
BARSAK	Inner Wall Plateau	48850	6106.25	9770
	Outer Wall Plateau	11496	1437	2299.2
	Cliff Wall	38202	4775.25	7640.4
	Ditch	6714	839.25	1342.8
	TOTAL:	105262	13157.75	21052.4
NIKOLIDHES	Enclosure	102352	12794	20470.4
	Casemates	9731	1216.375	1946.2
	Ashlar Wall	3620	452.5	724
	Tower	5422	677.75	1084.4
	TOTAL:	121125	15140.625	24225
VOUNARI	Mound	18900	2362.5	3780
	Phase 2 Enclosure	13451	1681.375	2690.2
	Phase 2 Tower	2690	336.25	538
	TOTAL:	35041	4380.125	7008.2
	Phase 3/4 Platform	5253	656.625	1050.6
	Phase 4 Wall	489	61.125	97.8
	TOTAL:	5742	717.75	1148.4
NITOVIKLA	Blockhouse	14531	1816.375	2906.2
	Enceinte	63103	7887.875	12620.6
	TOTAL:	77634	9704.25	15526.8
KAFKALLIA MBA HOUSE	75 m walls	2629	328.625	525.9
	143 m^2 earth roof	1205	150.625	241
	TOTAL:	3634	479.25	766.9

Table 6.4- Architectural energetics calculations for Agios Sozomenos case study fortresses, and comparanda

Expedition did not publish reliable measurement data for the outer enclosure at Nitovikla, so I used estimates obtained from the sketch site plan prepared by the Swedish Cyprus Expedition and utilizing the average enclosure wall thickness from other sites. For the structures at Agios Sozomenos, wall lengths were measured in GIS and then multiplied by the average width of the features as measured in the field.

Calculating volume also requires the height of the structure, which is frequently unknown for archaeologically recovered plans, so conservative estimations were adopted. In order to preserve inter-site comparability, I used the same assumptions between sites whenever possible. The volume of mudbrick, stone wall, rubble fill, ashlar, and ditch, were calculated separately as they utilize different building techniques, with different calculations for procurement, transportation, manufacture (only for mudbricks and ashlar), and construction. I presumed that these foundations, like other contemporaneous architecture, might support mudbrick superstructures. I estimated the total height of the thick (>1.2 m wide) walls as 2m. The height of the stone foundations were assumed to be 1 m for all walls, with 1 m of mudbricks on top. The outer wall at *Barsak* was calculated on the assumption that it was only 1 m high, half stone foundation and half mudbrick. The negative volume of the ditch was calculated based on 45 degree sloping sides, with an overall 5 m width and 1.5 m depth. At *Kafkallia*, calculations did not include domestic architecture, as these were not intrinsic to the fortress. At *Nikolidhes*, however, calculations included the casemate walls, as these are part of the structure of the fortification. The same procurement and transportation costs were used for all sites.

As it is, the calculations presented here are still heavily reliant on guess-work regarding the construction techniques of the fortresses. I chose to set the wall height at 2 m, as this is a sufficient height to act as a barrier to movement and sight. However, it should be noted, especially for the very heavily built enclosure walls and towers, that this is quite conservative. Higher elevations would only be conjecture, but I would suggest that wall would reasonably stand 2x as high as their width, so that the main enclosures would easily have stood over 3 m in height. Particularly unclear, however is whether the additional height beyond what is presently preserved would have been achieved by means of higher stone footings or with the addition of mudbrick. The weather on Cyprus is such that mudbrick architecture, when exposed to the elements without routine maintenance, will collapse and dissolve in a matter of decades.[4] Stone walls are more resilient and faster to build than mudbrick walls if the necessary materials are available, but they may also be the target of robbing for material for later construction, so the quantity of material in wall collapse cannot reliably be used to reconstruct the volume of the original structure. Conservative and consistent estimates of wall size and materials between sites allows inter-site comparisons to be made, but further information regarding the

[4] The modern village of Agios Sozomenos, abandoned in the mid-1960s due to intercommunal violence, is a case in point. Visitors to the Frankish church or the Byzantine saint's cave also have the opportunity to observe the process of archaeological site formation as the houses of the village slowly disintegrate.

specific building techniques used at a site could significantly impact labor estimates. For example, the energetics calculations I used assume that soil and water for mudbricks were collected from approximately the same distance at all sites. However, if the water sources and soils available atop the plateau were not sufficient to the task, the builders of the fortresses would likely have turned to the soil and clay deposits along the banks of the Yalias River. Using the shortest walking route between the fortresses and the riverbed, even without accounting for the elevation change, the differential access to the river would have significantly increased the cost of construction with mudbrick, especially at *Barsak* where costs could have increased more than one third (see Table 6.5).

	Total Labor (p-h)	w/out Transport	% Cost Transport	River Distance (km)	Total Labor w/ River Mud	% Increase
Kafkallia	68757	37377	54%	0.9	81287	18%
Barsak	105262	60285	57%	1.3	141338	34%
Nikolidhes	121125	65818	54%	0.5	121125	0%
Vounari (Phase 2)	35041	14961	43%	---	---	---
Vounari (Phase 4)	5742	3194	56%	---	---	---
Nitovikla	77634	42247	54%	---	----	---

Table 6.5 - Variation in labor costs due to transportation of materials, and additional costs as a result of sourcing mud for bricks from the Yalias River.

These calculations reveal that the costliest task in fortress construction was the transportation of building materials from their place of acquisition to the construction site, even when assuming that building materials were obtained as locally as possible. These figures are in line with the Abrams' results for construction at Copan (1994:65, Table 9). The calculations for Phlamoudhi *Vounari*, however, are significantly higher than the figures obtained by Horowitz (2007:342-5), whose calculations used a transportation rate of 6.25m^3/person-day of fill for the construction of the artificial mound. She obtained this rate from an assessment of the labor required to erect the mound at Meddler's Point in Arizona (Craig, Holmlund, and Clark 1998), which assumed that the fill for the 775 m^3 mound had been obtained at an average distance of just 25 m from where it was used. While this distance is feasible for a 775 m^3 mound, the mound at *Vounari* is roughly 5 times as massive as the mound at Meddler's Point, containing approximately 4000 m^3 of fill. Extracting this much fill in the immediate vicinity would have left deep trenches. Extending the average acquisition distance to 100 m drops the transportation rate to .375m^3/person-hour, or just 3 m^3/person-day, assuming a grueling 8-hour work day. Abrams and Craig et al. prefer a 5-hour day, as did Horowitz, so this change adds 1370 5-hour person-days to Horowitz' labor estimates, a 57% increase. This demonstrates the importance of using well-reasoned and explicit assumptions in energetic calculations, and also serves as a warning to those who would compare energetics between sites to check that reasonable assumptions and equivalent labor rates were used before making comparisons. Even with lower labor estimates for *Vounari's* construction, Horowitz had to confront the problem of how so much labor could be mustered in a small village-based society like that on Cyprus at the end of the Middle Bronze Age. She concludes that *Vounari* might have taken multiple years for the people of the Phlamoudi locale to build. Instead, I want to call attention to the capacity of monumental architecture, through its requirements and its affordances, to bring people together and forge new group identities through voluntary communal association directed towards shared goals (see Pauketat 2000).

Having a sense of how many person-days it takes to build a structure allows us to consider the necessary size and organization of the labor force and the resulting duration of the project, just as Horowitz did. It seems likely that most of these sites were built in phases, but the link between these sites and a driving concern with defense, indicates that their construction would have been a priority for the communities involved. The availability and expenditure of energy for construction by small-scale societies organized through family recruitment are typically quite small, as evinced by a survey of ethnographic cases by Abrams (1994:101-102), typically less than a couple hundred person-days. The energetics calculated for the large house at *Kafkallia* indicate that larger domestic structures in the Cypriot Middle Bronze Age were already quite costly, requiring several hundred person-hours to build. Their size may indicate the presence of larger households or the growth of private wealth being expressed in domestic architecture. Either way, the labor required to build any of the large fortifications far outstrips that supported by ethnographic comparanda for kin-based labor projects or for local domestic architecture by multiple orders of magnitude. While the projects may have been conceived of, and entered into, voluntarily as a community, the actual completion of the projects would provide opportunities for emergent leaders to establish themselves.

These calculations show that the construction of even the smallest of the Cypriot fortresses represents a tremendous investment in time and energy, especially when compared to the domestic structures that were built in previous periods. By these intentionally conservative numbers, it would take 50 workers nearly 200 8-hour days of labor to construct the fortifications at *Kafkallia*. The site is just 4 ha. in size, and only 25 possible domestic structures are visible, so 50 workers could easily have been most of the village's able-bodied labor force. Work on such a project would have to be balanced with the necessity of other household and agricultural tasks, so it would have been impossible for the village to produce all this labor at once. Charles Erasmus (1965:280) suggests that the typical household in a chiefdom or segmentary village-based society could dedicate 40-50 person-days a year to communal labor projects without negatively impacting their own productivity. If each of the 25 potential domestic structures visible within *Kafkallia* represents a "household," by this calculation 1000-1250 days of labor would be available. At that rate, they could complete the fortifications in about 8 years. Construction at a markedly faster rate would require more laborers or specialization and communal support of those specialists.

The efficient plan of the fortifications of *Kafkallia,* however, may suggest gradual construction and voluntary participation by members of the community. First, the occupation on the promontory may have been enclosed by just a single wall. When the village outgrew the initial fortifications at some later stage, this could have provided the impetus for further construction. Such an extended duration of construction, and the involvement of the entire community as laborers or in support of the laborers, would increase the significance that the project and the resulting monument must have had for the group. The monumentality of the *Kafkallia* fortress, such as it is, is a product of the scale of the structure and the communal investment that scale demanded and the experiences it created. The large tower structure is the only component of *Kafkallia* that suggests elaboration, and its location near the entrance to the promontory still points to elaboration with defensive affordances in mind.

Barsak presents a very different picture, as there was no nearby village, which immediately begs the question of who participated in its construction. The ASESP survey confirmed that several settlements were present in the Yalias valley at this time, with many located near access routes to the Barsak promontory (demonstrated in Chapter 6), so it is possible, or even likely, that several communities collaborated on the project. However, unlike *Kafkallia*, where the architecture produces its defensive affordances efficiently, the scale and elaboration of the architecture at *Barsak* begins to "exceed the requirements of any practical functions." The double-wall-and-ditch system at this site is a particularly impressive and expensive innovation, but like the tower at *Kafkallia*, it still indicates an interest in defense. The same cannot be said of the perimeter wall that follows the cliff edge of the *Barsak* promontory. This wall faces out over a 20+ meter sheer drop, and another 20 steep meters down to the valley floor. Not even a goat can scale this cliff (a person would require technical climbing equipment) so an appeal to the practical defensive affordances of a wall as explanation for its construction are insufficient. It is clearly an elaboration, and one that represents more than 30% of the total labor costs of *Barsak's* construction. The cliff-facing enclosure wall at *Barsak* alone would have taken 50 people more than 100 days to build, and so displays a significant ability to marshal excess energy.

So, why was this wall built, and what meaning would this wall have had for those who saw it up atop the cliffs? For those who built it, whether voluntarily or through some coercive force exerted by emergent elites, it perhaps instilled a sense of pride and ownership, forging a group identity among those who worked together on its construction or lived beneath its walls. As a structure that among other functions likely housed livestock, the wall would also have communicated the wealth of the community and its ability to fill the space within it. The symbolic function of fortifications derives, at least partially, from their practical defensive function (Keeley 1996), so all these walls also communicated a sense of security to those with access to them, while the message of community strength communicated by the same walls would be a warning to those without who would try to enter them without permission. Thus the efficacy of the fortress as a defensive assemblage was increased by the capacity of walls to deter attacks before they even occurred. The conspicuous consumption of energy on a wall that provided little or no physical defensive affordances generated these messages and efficacies through the relationships between the fortress, the landscape, and the people who experienced them, and points to conscious investment in enhancing certain efficacies of the fortress, reflecting a proactive rather than reactive approach to defensive strategy.

The significant differences in the architectonics of the fortresses at *Kafkallia* and *Barsak*, and the apparent instrumentalization of their monumentality, also point to differences in the organization of the community or communities that built them. The density of domestic architecture visible is greater, and more artifacts were recovered during survey, on the promontory than in the fully enclosed area, and though the quantities of portable material culture differed between the two areas, the types and quality of materials did not. This suggests that the promontory was the original focus of settlement, which then expanded. Thus, the fortifications at *Kafkallia* give a sense of ad hoc construction, built to enclose an existent village in the most efficient manner (one wall cutting off the promontory), and then later expanded (the northern wall). If the whole system of walls was conceived at once, the division of the settlement seems an odd strategy, unless there was a desire to keep two groups separate, for which such a massive building project is an unprecedented expenditure and the material culture from survey provides no evidence of qualitative differences between the areas. I propose that the additional walls that create the U-shaped enclosure were built either to deal with crowding within the settlement subsequent the original promontory wall's construction, or the U-shaped enclosure was built either simultaneously or subsequently to that wall in order to enclose and protect livestock. In the latter case, when the settlement did outgrow its materially restricted space some residents chose, or were forced, to build their homes in the area previously reserved for livestock.

Barsak's fortification system presents as more conceptually unified, and ceramic evidence suggests a later construction date than that of *Kafkallia*. As the walls were not built to enclose any pre-existing and immobile resources, the builders had more flexibility to choose a location that provided the desired affordances and to design a structure with the form and material components to produce particular desired effects. The scale of the built features at *Barsak*, requiring easily 30% more time and energy to build as those at *Kafkallia*, does suggest that more people were involved in its construction, requiring greater levels of coordination. While greater organization and forethought can be read in *Barsak's* design, there is as yet no indication that the agency behind its initial construction was located within an aggrandizing leader or group of elites. Instead, the undifferentiated exterior and interior of the site speaks to a continued egalitarian or community-focused ethos. Unlike *Kafkallia*, which was clearly centered on one village community, the empty enclosure at *Barsak* was likely the product of the pooled labor of multiple groups, living in the valley below. A smaller group could have built *Barsak* over a longer, or more distributed time frame, but the overt defensive nature of the site and the choice to construct a ditch, a relatively low cost and low visibility, but highly effective defensive elaboration, indicates that protection from violence was the builders' main concern. The wall facing the cliff could easily have been the last piece of the structure built, an elaboration added *after* the immediate physical requirements of security were met.

The display of excess energy in construction, the implication of wealth hidden behind walls, and the communication of defensive strength, can all be both product and source of political power. Emergent elites could capitalize on these power sources by directing or coercing construction, or by coopting them after they were completed. The construction of *Barsak* likely brought together people from different groups for extended periods of time, forging a new shared identity, on which those who assumed the responsibility and took the credit for coordinating the construction could have capitalized. At *Barsak* it appears that architectural elaboration and monumentalization remained directed towards expressions of *communal* solidarity and strength – additional walls or ditches improved the defensive efficacy of the structure as a whole, and the interior remained open and, at least architecturally, uncontested. As at *Kafkallia*, there was the opportunity for emergent elites to produce political power through organization, and *Barsak* was certainly a more complicated construction project to coordinate, but the design of the architecture itself was not yet being purposed to the reproduction of those power relations.

Nikolidhes remained in use the longest of the three Agios Sozomenos monumental enclosures. The presence of Red Polished ware suggests that the enclosure at *Nikolidhes* could have been built before the end of the Middle Bronze Age, so the site was possibly in use concurrently with *Barsak* and *Kafkallia* (see

Figure 5.31), although where it fits in the sequence of construction is not certain. The elaborate tower structure at the northeast corner of the enclosure, however, is certainly a later addition, as evinced by the remodeling of the enclosure wall to incorporate its addition. Additionally, the earliest ceramics recovered during excavation associated with the tower are early LC. This is the clearest instance of monumental elaboration subsequent to the original construction episode (or episodes), and at this time appears to have been the latest major building episode at any of the Agios Sozomenos enclosures. The walls of the casemate rooms around the southern and western sides of the enclosure only abut, but do not join, the enceinte, though how soon after the enclosure's construction they were added is as yet unclear.

At *Nikolidhes* just one wall encloses the entire site and, as at *Barsak*, much of the enclosure here is defensively unnecessary as nearly 50% of the 2 m thick enceinte faces out over the edge of impassable cliffs. The enceinte at *Nikolidhes* is also the most massive of all the Bronze Age enclosure walls in the Agios Sozomenos region, extending almost 900 m in length and enclosing almost 5 ha. The monumentality of the structure created by the massive amounts of labor and material that went into its construction, including the more than 400 m of defensively "unnecessary" wall, was enhanced during a subsequent construction episode by the replacement of a segment of the wall with the tower platform in the northeast corner of the enclosure.

The rough-ashlar facing of the tower and the wall that joins it to the enclosure are also evidence of monumental elaboration, though a different sort. Architectural energetics calculations indicate that 15 m of rough ashlar required roughly ten times to the energy required to produce a fieldstone wall of the same dimensions, even assuming that the limestone blocks had been quarried out of the cliff-face just meters away, and the ashlar facing was nearly half the total energy cost of the tower. Unlike the physically unnecessary enceinte walls at *Barsak* and *Nikolides*, the ashlar wall was not visible to those outside the structure, so no defensive affordance, even deterrence, may be ascribed to its construction. Any symbolic communication intended by this elaboration was directed to a different audience with a different message: rather than communal solidarity, wealth, and strength, communicated outwards towards an undifferentiated audience in the wider landscape, the ashlar spoke to the ability of someone or some group to marshal large quantities of labor purely for display, and this message was directed primarily to members of its own community. Unlike architectural features with primarily defensive affordances or communicating community identity and solidarity, the ashlar wall at *Nikolidhes* invokes Earle's (1997) definition of monumental architecture as materializing the ideology of a dominant group by expressing unambiguous messages of power and authority over others. Here then, in contrast to *Kafkallia* or *Barsak*, we have strong evidence of hierarchical relations *within* the community being produced and reproduced through architecture, the construction of which would have been directed not by egalitarian consensus, but almost certainly though the coercion of emergent elites.

This section established the monumental nature of Cypriot fortresses, particularly the massive enclosures of the Agios Sozomenos region. Monumentality afforded these structures the capacity of symbolic communication, conveying messages of power and solidarity, and improved the defensive efficacy of the structures by means of deterrence. But the configuration of materials that produce a fortress and its capacities for defensive and monumental efficacy also generated other effects through their interactions, including properties of asymmetry and domination (Latour 2005:85). Thus the massive and elaborate enclosure walls also represent the architectonic investment in the production and communication of power differentials within communities in the Agios Sozomenos region, and indicate the existence, and reinforcement, of emergent institutionalized sociopolitical hierarchy in the community.

Docility: Disciplinary Efficacy

So far in this chapter I have examined how the affordances of the materials and architectural design of Cypriot fortresses contributed to the defensive efficacy of the fortress assemblage, and how the scale of the materials and entangled relationships between people and things created a sense of monumentality to these structures, out of which communicative efficacies emerged. Now I consider how the interactions of the same components that produced these efficacies also generated social power through the techniques of discipline, constituting new political subjects through processes of objectification and constraint.

Enclosure and Partitioning: Defining and Dividing Space

Foucault classified many of the disciplinary techniques that fortresses utilize under the heading of the "Art of Distributions." The first, and most easily observed, of these are *enclosure* and *partitioning*. Enclosure establishes space that is differentiated from other spaces, and utilizes that space for the concentration and control of human bodies and activity. With the Cypriot fortresses, the massive encircling enceinte walls are the most obvious examples of the use of this technique. The enceinte provided defensive capabilities that were beneficial to the community by limiting and controlling access to space, but they also created foci of human activity. People lived behind the walls at *Kafkallia* and *Nitovikla*. The enclosures at *Barsak* and *Nikolidhes* likely held herders and their livestock. All of the sites have artifacts that provide evidence for the enactment of other activities as well. These activities would previously have been performed elsewhere, but were now concentrated in one place by the communal expenditure of energy that produced the walls that enclosed them. As previously observed, visible *enceinte* could also have made the fortresses into targets, as they advertised where the most powerful people (and their stuff) were located in space. Concentrating people, their moveable goods and animals, and their activities in one place and surrounding them with sturdy walls improved defensibility, and at the same time it also served to make people, materials, and their interactions more knowable. Although the walls would block visual access and create a sense of security and privacy, the walls also marked the place where these things were located, making them easier to find in the landscape (see more discussion in Chapter 7). By limiting the entrance points to an enclosure, these entrances were more easily monitored. This both improved the defensibility of the structure and made it easier to track who and what entered or exited the enclosure.

The partitioning of space goes hand in hand with enclosure. Enclosures simply divides inside from outside, but the monumentality of the structure, through scale or elaboration, could grant the inside/outside divide additional significance. Foucault (1977:143) called partitioning the act of dividing space into "as many sections as there are bodies or elements to be distributed." Walls partitioned space within the fortresses for defensive or practical economic purposes, but the layout and elaboration of the partitions was also an opportunity for emergent elites to produce and reproduce their authority. With a seemingly empty enclosure like *Barsak*, or the single enclosed tower at *Vounari*, there are two elements – that which is inside the walls, and that outside, (re)producing a power dynamic only between those who were members of the community and those who were not. Both *Kafkallia* and *Nitovikla* had double-enclosures of sorts, where the enceinte walls of the fortresses partitioned space into multiple sections, thus providing additional opportunities to divide, and thereby sort and control, people and materials. These divisions could have been practical and built through consensus, but regardless of their original intent, the affordances of the architecture create opportunities for social inequality to be established and affirmed through differential levels of access. The blockhouses at Enkomi and *Glykia Vrysi* enclosed and partitioned space in a fashion not dissimilar to houses or workshops, but in an innovative scale and format. The most striking innovation in the partitioning of space, though, are the casemate rooms at *Nikolidhes*. The 24 spur walls recorded at *Nikolidhes* define at least 14 spaces (probably rooms) of equal size, approximately 5m x 7m. Extrapolating these dimensions to include the full length of the southern and eastern walls of the enclosure where the spur walls are found, there could have been as many as 85 of these rooms. This kind of even, regimented partitioning of space is unknown at this scale anywhere on Cyprus during the Late Bronze Age, and as such presents unequaled and hitherto unprecedented affordances for the observation of the presence and interactions of people and things, and potential control over access and movement by emergent and aggrandizing elites, who may well have directed their construction.

Functional and Hierarchical Space: Defining and Controlling Movement and Activity

The "Art of Distributions" encompasses two other disciplinary techniques, which Foucault describes in Discipline and Punish – the creation of functional spaces and the hierarchical ranking of space – both of which are essentially elaborations on the previous techniques of enclosure and partitioning. They relate to another category of disciplinary techniques defined by Foucault as the "Control of Activity," but these were primarily concerned with temporal rather than spatial control, over the human body. However, the architectonics of the Cypriot Bronze Age fortresses produced functionally and hierarchically defined spaces that controlled movement and behavior in a similar "control of activity" and thereby contributed to discipline of the human body by increasing its utility and decreasing resistance of the individual. The first of these techniques is the creation of functional spaces, which are spaces coded for particular use, thus enabling supervision of activity and control of communication, and improving the economic productivity of the space. Hierarchical ranking of space is the second technique, and both can be seen operating through the affordances of Cypriot fortress architecture. The creation of functional spaces can be identified by the presence of specialized artifacts or other evidence of activities (e.g., tombs in cemeteries, cook pots in kitchens) or by the creation of space particularly suited for certain functions (e.g. regimented, controlled space for storage magazines, large open space for animal corrals). The hierarchical ranking of space can be seen in the use of architectural features to mark a space as having a special significance or use, and also in differential levels of access, or control of access, over a space.

Our knowledge of the organization of space within the MCIII-LCI fortresses of Cyprus is limited by the lack of excavation, and by site formation processes that have resulted in fragmentary preservation. Particularly significant for the present study is uncertainty regarding the locations of gates and doorways. Spatial syntax analysis, as first defined by Hillier and Hanson (1984) and later revised by Markus (1993) depicts the architectonic relationships of spaces in a building or settlement using spatial graphs that simplify the structure to spaces (nodes) and connections between spaces (axes). These graphs help clarify how spaces within a structure are assembled and interact, and using the graph the symmetry and distribution of the relationships between spaces can be quantified. Symmetry describes the accessibility of spaces, with spaces that are directly accessible to each other considered symmetric, while spaces that can only be accessed by passing through other spaces are considered asymmetric. Distribution, measured as a Control Value, describes the number of connections between spaces, and how much control a particular spatial node has over movement through the graph. Spatial syntax analysis therefore provides a quantitative method for comparing the relative levels of control and hierarchy within any configuration of spaces. However, without knowledge of which spaces were connected, the usefulness of this methodology is limited, so for the present case study, the full application of spatial syntax analysis is limited to *Glykia Vrysi* and the fortress at Enkomi. Both sites are particularly appropriate and interesting for the application of this analysis, because relatively complete floorplans for the main buildings are available for both their initial construction and a later phase, allowing changes in the use of space over time to be observed and measured as well as allowing comparisons between the sites. Spatial graphs of both the earlier and later phases at both sites appear in Figure 6.5.

The floorplans of the blockhouse fortresses at Enkomi and *Glykia Vrysi* appear quite different, but examination of the spatial graphs reveals that the buildings actually used space, and later modified their use of space, in similar

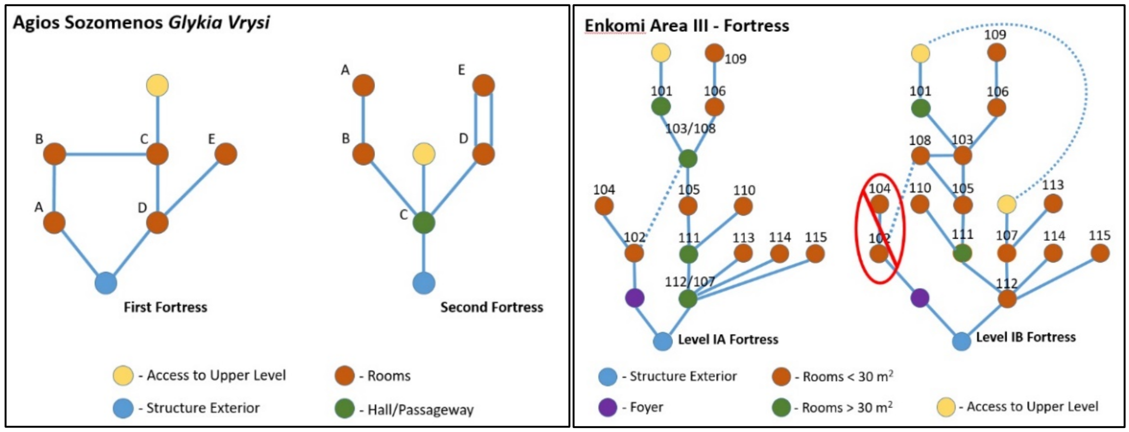

Figure 6.5 - *Spatial Graphs of the blockhouse fortresses at Glykia Vrysi and Enkomi Area III.*

fashion. Much of the analysis necessarily hinges on the interpretation of whether there was the second entrance into Enkomi through the tower made of rooms 102 and 104, entering into room 108. Building just two small rooms and closing them off from the rest of the building would be highly unusual, so the excavator, Porphyrios Dikaios believed that there was an entrance through the damaged wall between 102 and 108. Crewe (2007:89) observes that after the destruction of the IA fortress at Enkomi, rooms 102 and 104 fill with debris, which indicates that those rooms went out of use, and suggests that they no longer opened to the exterior. However, it is also possible that the entrance through the southwest gate remained open, despite the accumulation of detritus. Certainly, it appears that the passage between room 112 and 111 becomes blocked off at some point later in Level IB, cutting the entire building into two unconnected pieces, at which point the second entrance must have been in use again. Unfortunately, the exact sequence of these modifications could not be determined from the excavations, so the present analysis relies on the belief that the entrance was in use in Level IA and was not in use at least at the beginning of Level IB, immediately following the reconstruction episode.

Accepting these premises, during the first phase of use after construction, both buildings have two entrances on their south sides. Two entrances to a building allows movement to circulate through a ring of spaces, rather than a purely linear in-out pattern of movement. This can be seen in the spatial graphs of *Glykia Vrysi* and the fortress at Enkomi, where the earlier phases of both buildings have a sequence of major spaces (A through D at *Glykia Vrysi*; 103/108, 111, 112/107 at Enkomi) forming a ring connected via the outside of the structure. After violent destructions both structures were rebuilt, with almost identical floorplans to the earlier phases. However, both buildings were reconfigured so that they had only one operating entrance. This breaks the ring, thus creating a more distributed organization of space with certain key rooms controlling access to other areas of the building.

With only one entrance, accessing the old staircase in room 101 of the fortress at Enkomi would have required a visitor to pass through five distinct rooms, whereas before the reconstruction it would have required movement through only three. This may explain why a new staircase was built in room 107, which could be accessed from outside the fortress by passing through only two rooms (112 and 107). This also supports the hypothesis that the gate through rooms 102 and 104 in the southwest corner of the building went out of use and the passage between room 102 and 108 was blocked off. The addition of the staircase in 107 preserves rapid access to the upstairs from outside the structure, but still preserves some control, as room 112 became an entry hall of sorts now separated from room 107 so that the stairs were not immediately accessible from the outside of the building. It is also in Level IB that extensive evidence for metallurgy is found in the fortress – metallurgy continues in room 101, which had become one of the deepest, and most controlled, spaces on the ground floor of the building, as well in the adjoining rooms of the west wing.

Calculations of the mean depth (how spaces separate any space from any other space), relative asymmetry and control values for the various spaces appear in Table 6.6. Real Relative Asymmetry, or RRA, is the relative asymmetry normalized by means of a constant calculated by Hiller and Hanson (1984:112), thus allowing comparisons to be safely made between sites with different numbers of spaces. The change in spatial organization at both sites over time is quite clear, with both mean depth and asymmetry increasing between the first and second architectural phases. This indicates that the space and access was more distributed in the earlier incarnations of the fortresses, while movement through the structures became more limited, and potentially controlled, in the latter. In *Glykia Vrysi*, control which had been distributed between spaces C and D becomes concentrated exclusively in room C in the second fortress. A similar pattern of change occurs at Enkomi between Level IA and IB, but is somewhat obscured by the addition of a second staircase and by the splitting of two of the larger, and formerly more controlling rooms, into two spaces each. Room 103/108 was formerly the large hall that one entered through the southwest gate, and 107/112 was the large hall that was entered

ENKOMI	LEVEL IA				ENKOMI	LEVEL IB			
SPACE	**MD**	**RA**	**RRA**	**CV**	**SPACE**	**MD**	**RA**	**RRA**	**CV**
101	2.87	0.29	1.11	1.25	**101**	3.38	0.34	1.35	0.75
102	2.2	0.18	0.71	1.75	**103**	2.63	0.23	0.92	1.83
103/108	2.13	0.17	0.67	1.83	**105**	2.31	0.19	0.75	1.08
104	3.07	0.32	1.23	0.33	**106**	3.38	0.34	1.35	1.25
105	2.2	0.18	0.71	0.58	**107**	3.00	0.29	1.14	1.7
106	2.87	0.29	1.11	1.25	**108**	2.94	0.28	1.10	0.58
107/112	2.33	0.20	0.79	3.58	**109**	4.25	0.46	1.85	0.5
109	3.73	0.42	1.62	0.5	**110**	3.06	0.29	1.17	0.33
110	3.13	0.33	1.27	0.33	**111**	2.19	0.17	0.68	1.53
111	2.27	0.20	0.75	1.7	**112**	2.31	0.19	0.75	2.66
113	3.2	0.34	1.31	0.2	**113**	3.81	0.40	1.60	0.33
114	3.2	0.34	1.31	0.2	**114**	3.13	0.30	1.21	0.2
115	3.2	0.34	1.31	0.2	**115**	3.13	0.30	1.21	0.2
Outside	2.27	0.20	0.75	0.52	**Outside**	3.13	0.30	1.21	0.2
2nd Floor	3.73	0.42	1.62	0.5	**1st Stairs**	2.57	0.22	0.89	0.5
					2nd Stairs	3.81	0.40	1.60	0.33
AVERAGE	2.83	0.28	1.09		**AVERAGE**	3.06	0.29	1.17	

GLYKIA VRYSI	FIRST FORTRESS				GLYKIA VRYSI	SECOND FORTRESS			
SPACE	**MD**	**RA**	**RRA**	**CV**	**SPACE**	**MD**	**RA**	**RRA**	**CV**
A	2	0.4	1.18	1	**A**	2.67	0.67	1.96	0.5
B	1.83	0.33	0.98	0.83	**B**	1.83	0.33	0.98	1.25
C	1.5	0.2	0.59	1.83	**C**	1.33	0.13	0.39	3
D	1.5	0.2	0.59	1.83	**D**	1.83	0.33	0.98	1.25
E	2.33	0.53	1.57	0.33	**E**	2.67	0.67	1.96	0.5
2nd Floor	2.33	0.53	1.57	0.33	**2nd Floor**	2.16	0.46	1.36	0.25
Outside	1.83	0.33	0.98	0.83	**Outside**	2.16	0.46	1.36	0.25
AVERAGE	1.90	0.36	1.06		**AVERAGE**	2.09	0.44	1.29	

Table 6.6 - Calculated spatial syntax values for Glykia Vrysi and Enkomi. MD is Mean Depth, RA is Relative Asymmetry, RRA is Real Relative Asymmetry, and CV is Control Value.

via the eastern entrance. After the division rooms 103 and 112 continue to have Control Values as high, or even higher than they did during the previous phase, but 108 and 107 diminish in importance, though 107 continues to control access to room 113, and becomes the most direct access to the upstairs via the new staircase.

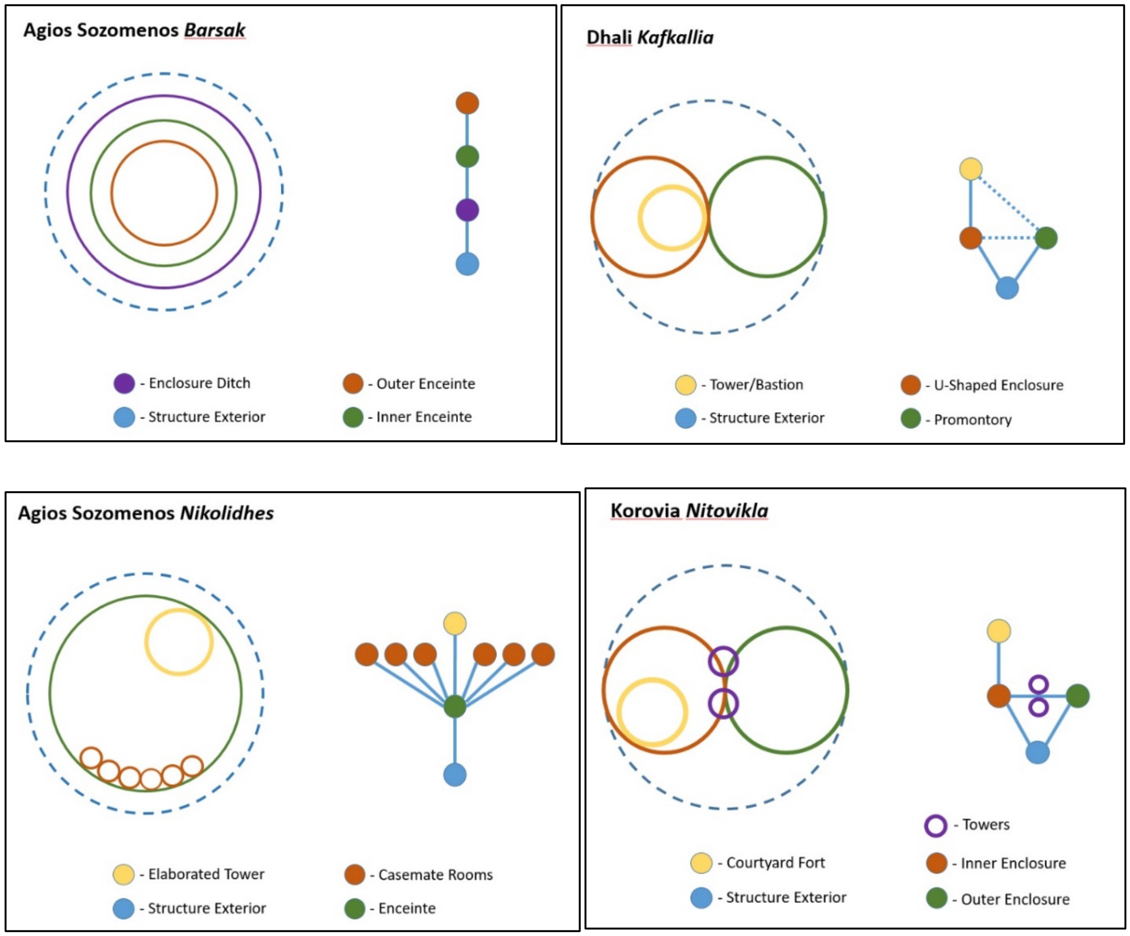

Figure 6.6 - *Schematic drawings of the spatial organization of the enclosure fortresses, with spatial graphs. Compare to plans in Figure 6.1.*

For the large enclosures, formal, quantified spatial syntax analysis is not possible, but simplified schematic drawings of the fortifications aids in discussion and comparison of the sites. The drawings in Figure 6.6 show the various enclosure spaces of the fortresses as solid rings. If the rings make contact the enclosures intersect, and there may or may not have been a gate. The schematics make clear how *Barsak* has the most layered defenses, but the least differentiated space. *Nitovikla* and *Kafkallia*, although seemingly very different sites, control space in a similar fashion, with a hierarchy established between two enclosures and then their courtyard buildings, although overall *Nitovikla* appears to have been more formally planned with greater architectural elaboration.

Barsak is a unique configuration of space - without any architectural definition of interior spaces, it is also without hierarchical ranking of internal space. This large undifferentiated space has led to its interpretation as a livestock enclosure (e.g. Frankel 1974; Rowe 1995). It is likely that this is one, among many, functions of this space, although the heavy defenses indicate that it was much more than a simple corral. Interestingly, ceramics and artifacts recovered at *Barsak* suggest that the people of the Agios Sozomenos region may have used the site for diverse social and economic uses. Large storage jars are not easily moved, so Plain White pithos fragments recovered during survey, including several decorated with ornate shoulder and neck bands, indicate that *Barsak* contained some long-term storage. Certainly the lack of a water source within the enclosure would likely have required water to be transported and kept on hand for use as needed. The presence of cookpot fragments and finewares, including a WPIII-V tankard (Figure 5.13) and a sheep or goat protome from a Red Slip vessel (most likely a bowl), as well as a large percentage of more typical bowls and closed vessels in Black/Red Slip and Red Polished IV hint at feasting or other communal ritual and display activities. A broken spindle whorl recovered during excavation and ground stone found during surface survey also indicate that production activities occurred inside the enclosure. However, the space within *Barsak* appears undifferentiated, so any hierarchical or functional divisions or distinctions may have been fluid and established through non-fixed markers on an ad hoc basis when contextually needed.

At *Kafkallia*, the enceinte encloses the domestic space of the village, but as hypothesized earlier, it is possible that the second enclosure may also have defined a space initially intended as livestock enclosure. This sort of enclosure and differentiation of space, especially this size, is not present within earlier settlements. Also, the tower encloses a sizable space (almost 400 m^2), whose heavy walls demarcate it as important, and the lack of internal divisions make it unlike a domestic structure. It is likely that this space had a special function, though without excavation any suggestions would be speculation. The two enclosures and the tower suggest the incremental creation of a hierarchical ranking of space, with the "inner" enclosure on the promontory tip the earliest, and possibly more prestigious of the enclosures, and the nearly 3 m thick walls of the tower enclosing some sort of special space. This configuration is not unlike that seen at *Nitovikla*, where the outer enclosure contained a cemetery, and the inner enclosure appear to have had smaller structures within it, possibly domestic. At *Nitovikla*, the towers on either side of the passage between the two enclosures indicate the potential for control of movement and collection of knowledge of people and things, with the differential control and knowledge establishing a hierarchy between the two spaces. The inner enclosure also provides access to the blockhouse, whose gate was marked by two massive ashlar monoliths, and the blockhouse itself was divided into a warren of casemate rooms and irregular spaces surrounding a courtyard, some of which were used for storage, some were a kitchen, and one contained the water cistern. *Nitovikla's* space is clearly defined and divided, with spaces reserved for particular use. The need to pass through a longer sequence of spaces to access some spaces also indicates some hierarchical ranking of space, with spaces around the perimeter of the blockhouse courtyard the most controlled (inside the yellow circle in Figure 6.6).

Nikolidhes also demonstrates a functional and hierarchical ranking of space, but in a somewhat different format than that seen at *Nitovikla* or *Kafkallia*. Foucault (1977:143) observes that "the disciplinary space is always, basically, cellular," with such division a procedure for knowing and controlling space. At *Nikolidhes* most of the enclosure appears undifferentiated, as at *Barsak*, but the highly regimented spaces around the southern and eastern sides of the enclosure, most likely used for agricultural or industrial storage, although use as stables or barracks is also possible, are exemplary of Foucault's cellular disciplinary space: tightly controlled space, designated for special use. *Nikolidhes'* tower is also the most overt example of hierarchical space creation among the Agios Sozomenos sites, as the ashlar wall clearly is intended to demonstrate control of energy and material resources, and its use marks a particular space as important, as did the monoliths at the entrance to the fort at *Nitovikla*.

Group Formation

Critical to the operation of disciplinary power are the techniques that contribute to the "composition of forces," which is essentially another name for assembling and articulating people in groups (Foucault 1977:162). These techniques are primarily undertaken for the purpose of improved production, but the composition of forces assembles people through the creation of shared identity, which also contributes to making them knowable and governable. Cypriot fortresses are implicated in such group formation processes, and in the production and reproduction of group identity. First and foremost is the organization of labor forces that produced the monumental architecture of the fortresses. Architectural energetics calculations shed light on the massive amounts of time and energy necessary to produce these structures, entirely beyond the scale of contemporary or earlier domestic or workshop buildings. Constructing the architectural elements that make up these sites required large labor forces working together for extended periods of time, over the course of months or even years. In other words, assembling the fortress would also assemble a community. In some instances, this labor may have been drawn from already existing social groups, and would have reinforced those group identities.

In contrast to *Kafkallia*, *Glykia Vrysi*, or *Enkomi*, the enclosures at *Barsak* and *Nikolidhes* do not have a direct relationship with a single settlement, the residents of which might be presumed to have built the fortifications. Although previously discussed in the context of understanding the monumentality of these two structures, which was most likely the result of labor contributed by members of more than one village or community, here we see that the process of monumentalization was simultaneously the operation of a disciplinary technique, forging new group solidarity. Assembling the fortress simultaneously assembled people and place together, as the people depended on each other for resources and labor, the fortress depended on the people for its construction and maintenance, and the people relied on the fortress for the defensive, economic and social affordances it provided them as members of the new assemblage. The persistence of the materials of the fortress allows the structure, and the resulting apparatus, to continue to operate in the domain of group formation beyond just the moment of construction, as the components of the fortress continue to focus, and organize, human activity in space. Once erected, the fortress afforded improved production, both by assembling and articulating the specialized functional spaces discussed above, and by increasing the security of the materials and activities of production. Additionally, the fortifications would have to be manned and maintained, continuing to tie the community directly to the materials of the structure. The opportunity for large-scale, secure storage afforded by the fortresses also contributed to the reproduction of group identities, as individuals may have contributed and withdrawn resources at communal storage facilities. The cellular structures at *Nikolidhes* are particularly suited to storage, and the presence of pithos sherds at all the sites indicates their use for this purpose. The same affordances of enclosure and visibility produced by defensive fortifications now worked together as disciplinary techniques to concentrate productive socioeconomic activities within their walls, constraining human activity by defining and enforcing limits on its spatial distribution.

The monumental enceintes and towers also symbolically communicated messages of strength, solidarity, and security. While these messages could act as deterrents, or magnets, to hostile forces, they also may have attracted new groups or individuals who desired access to the benefits these structures advertised and provided. As will be discussed in the further in the next chapter, the population of the Yalias river valley in the region immediately surrounding the Agios Sozomenos fortresses expanded greatly during the period of the fortresses' construction and occupation. During a time of widespread conflict, resulting in settlement destructions and abandonments (see Chapter 3), many of the Bronze Age inhabitants of Cyprus were displaced, and would have been in search of a secure place to settle. The walls of the fortresses at *Barsak* and *Nikolidhes* would have served as massive billboards, advertising safety and prosperity to those who became part of the local community, and subjected themselves to the operation of the fortress apparatus. At the same time, these walls were a continuous threat to those who would sought to harm their contents, or who did not desire to join the communities they represented. The efficacy of fortresses in the realm of sociopolitical group formation was thus directly related to the scale of the assemblage and the resulting capabilities to communicate symbolic messages to disparate groups and to generate security, particularly at a times of heightened violence.

Surveillance

The final disciplinary technique that operates through the affordances of defensive and monumental architecture is surveillance, which generates social power through the collection of knowledge and compels human agents to monitor and adjust their own behavior. In large measure, the surveillance capacities of these structures is directed outwards, into the surrounding landscape, and therefore will be discussed in detail in the next chapter. However, not *all* of the affordances of enhanced surveillance generated by Cypriot fortresses were so directed. The tower/bastion at *Kafkallia* is located at the interface between the promontory and the u-shaped enclosure, and the two towers at *Nitovikla* were located on either side of the passage between the eastern and western enclosures. These locations provide the perfect vantage points for monitoring movement between the two enclosures at both sites. As discussed previously, towers and bastions are more effective defensive structures when they project *out* from the enceinte, but at both *Kafkallia* and *Nitovikla* they are located on the interior of the wall, suggesting that at least some of their capacity for surveillance was pointed inwards. *Barsak* and *Nikolidhes* also offer opportunities for surveillance by the configuration of their massive enclosure walls and their large, and largely empty, central spaces. In the same way that the high walls and towers would have enhanced the visual capabilities of guards looking outwards, they would work in the other direction as well. At *Kafkallia*, this effect would be somewhat mitigated by the densely packed domestic architecture that would have obstructed the view of the interior, but with wide open spaces the movement and activities of people and animals within the other enclosures would have been exposed to surveillance by those on the walls.

This possibility for surveillance at all times and from all directions is an ancestor of the *panopticon* (see discussion in Chapter 1). The enceinte of the fortresses enclosed and limited movement, trapping those observed in a constant state of exposure. In the *panopticon*, the viewer is invisible in a high central tower, able to look in all directions without being seen. The towers at *Nitovikla* and *Kafkallia*, served such a function. This configuration is also reversed by the fortress enclosure, so that potential observers may be located on the perimeter and the observed are in the center, but the resulting effect is similar: within the enclosed space there is no location where the entire enceinte is visible, so occupants could never be certain whether they were being watched. This produces the "state of conscious and permanent visibility that assures the automatic functioning of power," as the operation of discipline through surveillance is both visible (as the walls) and unverifiable (in the unlocated viewer) (Foucault 1977:201). In this manner, the fortress itself becomes the observer, an apparatus assembled of materials that now has the ability to operate independent of its owners and operators. Without knowledge of where, or whether, an observer is present, the occupants of the enclosures would only be certain of the *possibility* that they were being watched. Any behaviors or activities that might be discouraged by the community or its emergent leaders could now be suppressed, at first through physical enforcement or the actual expense of constant observation, but with time and habituation as the community became used to their new state of observation, through self-policing. In other words, these individuals were now transformed into political subjects, not only through the objectification of the body through knowledge and physical control, but through self-subjectification to community norms. This is the quintessence of the operation of the disciplinary mode of power, produced through surveillance and enabled by the techniques of the Art of Distributions, and largely unknown on Cyprus before the construction of the fortresses. At Agios Sozomenos, the architectonics of the earlier structures at *Kafkallia* and *Barsak* suggest the beginnings of discipline's operation, but the structures at *Nikolidhes* and *Glykia Vrysi* elaborate on its use, even more so after their second construction phases.

Discussion

This chapter has presented the various defensive affordances of the material components and features of Cypriot fortresses, and how these features interacted to produce the defensive efficacy of the structures. Many of the affordances of the fortresses are at least partially a product of the scale of the materials and energy investment that went into their production, as well as the relationships between people, place, and architecture that developed during the process of construction and the subsequent use of the site. The fact that these relationships would have developed over time, shaped by the persistence of the architectural materials and forms that both blocked or constrained some human actions and afforded others, calls attention to the efficacy of the material world in shaping society independent of the original motives. A construction project pursued for defensive purposes could still have the effects of monumentality and discipline, affording and limiting future actions.

Monumentality, being the capacity for embodying and communicating symbolic meaning as enhanced by scale, was clearly an important characteristic of these sites, which architectural energetics calculations demonstrated to be the product of thousands of person-days of labor. Given that Cypriot communities at this time are known to have populations of only a few hundred at most, this indicates that the construction of these sites required significant investments of energy from a community, or in some instances multiple communities working together, over extended periods of months or even years. The size and duration of the fortresses' construction, their ongoing operational and maintenance requirements, and the economic and social function the structures provided, situated the fortresses as long-term foci of social interaction in the landscape, and afforded them the capacity to produce and reproduce senses of identity at a temporal and spatial scale previously unknown on Cyprus.

The same materials and interactions that produce the defensive and communicative efficacy of the fortress also opened possibilities for the kinds of disciplinary techniques described by Michel Foucault. This chapter traced the emergence and potential operation of several of these techniques in Cypriot Bronze Age fortress architecture, particularly in the sites of the Agios Sozomenos region.

The results of the disciplinary techniques, i.e. the objectification of the human body, and the creation of a new kind of political subject through self-subjectification, are more difficult to locate. Evidence for these processes, however, can be found in the beginnings of functional overdetermination and strategic elaboration seen in the development of fortress architectonics over time. For example, functional overdetermination may be seen in the monumental walls of *Barsak* and *Nikolidhes* that communicate strength but do not actually defend, while the later ashlar wall and casemate rooms at *Nikolidhes* suggest strategic elaboration of the fortress beyond its defensive function. The next chapter follows a parallel analysis, but expands the scale of investigation to consider the operation of the fortresses in the landscape, understanding that new affordances and efficacy emerge from the interactions of architectural components and landscape features, producing an apparatus the effects of which extend far beyond the boundaries of fortress walls.

Chapter 7

THE DISCIPLINARY LANDSCAPE: DEFENSE, COMMUNICATION, AND CONTROL

"The affordances of the environment are what it *offers* the animal, what it *provides* or furnishes, either for good or ill… it implies the complementarity of the animal and the environment." So said James J. Gibson (1979:127, emphasis original), the psychologist who first coined the term "affordance" and developed the accompanying theory, arguing that people, and animals, perceive the environment not just as surfaces and space, but as opportunities for action that in turn shape behavior. The preceding chapter considered the operation of the Cypriot Bronze Age fortress, particularly those in the Agios Sozomenos region, as architectural objects, while this chapter turns its attention to the environment in which the fortresses were situated. Certainly, the materials of which the fortresses were built and the forms they took generated much of the defensive, communicative and disciplinary efficacies that characterize these innovative structures. But fortresses are more than just buildings, and they do not operate independently of the wider physical and social landscape. The interactions between the architecture and the locales in which they stood were key to the effectiveness of the fortresses as they generated affordances for defense, communication, control and other actions that the architecture alone could not. Local topography, the distribution of resources and settlements, and transportation routes connecting these locales and the wider region are all components of an assemblage of which the fortresses were just one part. Investigating the relationships between these components reveals not just the defensive utility provided by the Cypriot fortresses during the Middle to Late Bronze age transition, but how the apparatus of fortress and landscape together worked to change the experience and perception of the landscape and in that process, how they were instrumental in the creation of a new kind of political subjectivity.

All the analyses in this chapter, unless otherwise specified, were completed using ESRI's ArcGIS software package, with a university student research license. The locations and dimensions of settlement sites are based on measurements taken in the field during survey with a handheld Garmin GPS (~3m accuracy), while the fortifications were recorded to centimeter accuracy by means of a Trimble Total Station or an RTK GNSS. A 25m resolution raster Digital Surface Model of Cyprus produced from the ALOS World 3D dataset made publicly available by the Japanese Aerospace Exploration Agency (JAXA) in 2015 was used for maps and analyses at the scale of the island, while a high resolution, 5m Digital Elevation Model produced from 1993 orthophotos was obtained from the Cyprus Department of Lands and Surveys for the study region. A GIS, or Geographic Information System, provides an opportunity to analyze and quantify landscape and settlement patterns, but its use is not unproblematic, particularly because it may reify assumptions and make the results of analyses appear more definitive than they are. The results of GIS analyses, especially those that are used to model human perception or behavior must therefore always be understood as subject to interpretation, and should be contextualized through the lenses of theory, experience, and other sources of data.

As in the preceding chapter, this chapter uses a tripartite division to trace the operation of fortresses in the Bronze Age landscape. First, I consider how the fortress interacted with the landscape to produce their defensive utility. The evidence for conflict and eventual warfare presented in the first two chapters of this dissertation points to defense as a driving force behind the design and construction of these buildings, which made effective use of environmental affordances to produce their defensive capabilities. Next, I look at how landscape topography and fortress architecture worked together to enhance the monumental nature of these structures and establish them as landmarks. This includes the prominence and visibility of the structures in the landscape, and the resulting communication between the fortresses and the settlements of the communities participated in their construction. Finally, this chapter explores how the interactions between the fortresses and the landscape defined and divided space and people, creating a disciplinary apparatus that operated far beyond the fortress walls. This disciplinary landscape shaped the way people perceived and experienced place and created new relationships between people and place, and in the process molded them into something new: political subjects.

A Defensive Landscape: Topography and Access

The notion that topography and other natural features of landscape contributes to the defensiveness of a site has largely been taken for granted by archaeologists. R. Kyle Bocisnky (2014:164) jokingly refers to archaeologists' assessments of defensibility as being like former US Supreme Court Justice Potter Stewart's definition of pornography: "I know it when I see it." There are features that are generally agreed to be indicative of increased defensibility, specifically inaccessibility and enclosure, but Bocinsky argues that archaeologists should be more explicit about the definitions and standards used to attribute defensibility to a site. Such is the goal of the present section, focusing specifically on how the siting of the enclosures and settlements in the Agios Sozomenos region utilized the affordances of the local landscape to produce their defensive efficacy.

Steven LeBlanc (1999) saw in his study of warfare in the American southwest during the Archaic Period that settlement patterns were among the most frequently cited evidence for warfare in the region. He divided the broad heading of "settlement patterns" into 4 categories of what he considered to be evidence for warfare, but which also provide a useful rubric for analyzing defensive settlement strategies (1999:55-56):

1. Site Configurations
    a. Sites planned and laid out for defense
    b. Sites increasing in size over time
    c. Small sites abandoned before large sites.
    d. Rapid construction of sites.

2. Sites on Defensible Landforms
    a. Small sites on more defensible landforms than larger sites.
    b. Sites located with secure water supplies.
3. Site Distributions
    a. Sites clustered with empty zones between clusters.
    b. Sequential site abandonment within clusters
    c. Sequential abandonment of clusters within region.
4. Sites located for Line-of-Sight communication
    a. Sight-lines bounded, defining site alliances.

The first category of evidence was discussed in reference to changes in settlement patterning across the island in Chapter 4, and in reference to the fortresses themselves in Chapter 6, but I will address some of the specifics of the Agios Sozomenos region. The analyses in this section, however, focus on categories 2 and 3, looking at the fortresses and their relationships with surrounding settlements studied by the Agios Sozomenos Excavations and Survey Project. Because there has been no systematic settlement and landscape survey of the locales surrounding the fortifications in the occupied territories in the north, the discussion of these places is of a necessity limited. The discussion of sight-lines and communications, while certainly important to defense, will be addressed more fully in the sections on monumentality and discipline, where they play a vital role.

Bocinsky (2014) (following Martindale and Superant 2009) developed methodologies for quantifying the defensibility of sites and locales in the landscape, some of which are modified and used in the present analysis. However, his methods were developed to compare sites in the Pacific Northwest, a significantly larger study area than the island of Cyprus. The numbers of sites known on Cyprus are comparably much smaller, the landscape more diverse within a smaller geographic area and, as already noted, the data for most of the regions with fortifications limited. Thus the explicit quantification of defensibility used by these scholars to enable comparisons between large numbers of sites within extensive geographic regions is of limited applicability to the Cypriot dataset. Instead, analyses based on their research are carried out to qualitatively demonstrate how the fortresses operate in the landscape, giving a sense of their defensive efficacy and the benefits and opportunities they provided to the settlements in the valley below.

Utilizing the aforementioned pornographic definition, it seems obvious that the massive plateau on which the three large enclosures at *Kafkallia*, *Barsak*, and *Nikolidhes* are set counts as a "defensible landform," but it is worth exploring what that actually means and how the affordances of the landscape assemblage specifically contribute to the defensibility of the sites. Martindale and Supernant (2009) proposed three factors for assessing this: elevation, accessibility and area. Elevation in the landscape, as with height in architecture, provides affordances of increased visibility, greater range with weapons, and depending on the steepness of the slope and the roughness of the terrain, also contributes to how readily and rapidly the site can be reached. Accessibility is intended to be a measure of ease of access, so for an individual structure would consider the number and width of doors and gates, but for a site needs to consider the entirety of the perimeter and how it is protected by barriers or inaccessible terrain. In this manner, the landscape itself may serve as an additional enceinte, or encircling barrier, to protect a site from attack. These limitations to access hold true for attacker and defender alike, but defenders may safely be presumed to have known the best access routes to mitigate these factors, while non-local aggressors would find them more frustrating. The last factor, the area of a site, is a significant, but complicated factor in defensiveness, as Martindale and Supernant (2009:196) observe, "large sites are easier to access and thus more vulnerable to attack, but also represent larger populations, which are stronger for defense".

Martindale and Supernant (2009:195) used a radial measure of elevation difference between the center of a site and the access routes. Bocinsky (2014:168) prepared a defensiveness index for a landscape using a similar calculation with in a Geographical Information System (GIS), so that each pixel in a raster was assigned a value based on its elevation as compared to those at a Moore distance of r^3 (i.e. the perimeter cells of a 7x7 pixel square centered on the pixel being measured). The first method was not developed for use with GIS and is reliant on how a researcher defines a "site" and its boundaries. The second method is useful for determining the relative defensibility of all locations in a landscape, but is dependent on the size of the raster being used, and also does not take into account the size of the site. With 25m rasters, a Cypriot fortress could be the size of just one pixel (e.g. Vounari) or 70 (e.g. Nikolidhes), but the defensiveness of one location might still be informative. A solitary pixel with a high defensiveness in a 5m raster however would be much less significant.

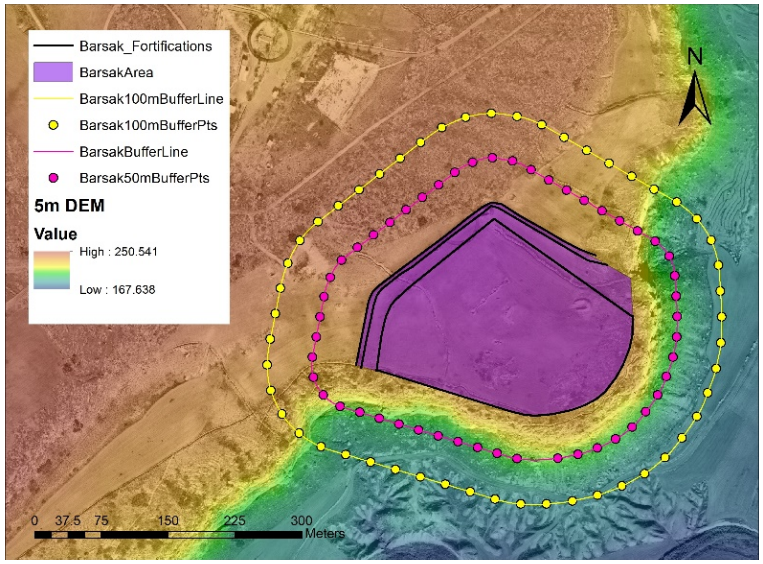

Figure 7.1 - Map of Barsak with the area utilized for average elevation calculation marked in purple, and evenly distributed points along 50m (pink)and 100m (yellow) buffers at which elevation was measured.

Instead of comparing the interior of a site to its perimeter as in Martindale and Supernant's methodology, as the location of the perimeters of the sites at Agios Sozomenos are very clear, I developed a related method (full details in Appendix B) which measures the average change in elevation between the perimeter of the site and 50m and 100m buffers (Figure 7.1). 50 m is a distance at which ranged weapons such as slings or arrows would become useful, and Martindale and Supernant (2009:194) propose 100 m as the minimum distance at which visibility is useful, giving the viewer sufficient warning to react defensively. The results for the three enclosures at Agios Sozomenos are summarized in Table 7.1.

Using this relatively crude metric it can be seen that all three sites provide a significant elevation advantage over the immediate surrounding territory, thus granting them increased defensive affordances in the realms of visibility and weapon

	Site Elevation	Elevation @ 50m Buffer	Elevation Change @ 50 m	Elevation @ 100m Buffer	Elevation Change @ 100 m
Barsak	235	219	16	209	26
Kafkallia	245	235	10	230	15
Nikolidhes	233	212	21	202	31

Table 7.1- Elevation change between site (average for site area) and the average elevations at distance of 50 m and 100 m from the site perimeter.

range. However, this measurement assesses average change around their entire perimeter, when the location of these sites on the edge of a large plateau means that some portion of each site has a significantly greater advantage conferred by elevation, while from other directions there may be less or even none. Thus, although this measurement provides some general indication of increased defensive capability due to topographical siting, it more accurately presents the defensive effects of more topographically circumscribed landforms such as tells or small hills, than the effects of large plateaus, ridges, or hillsides of which defensive structures only cover a small area.

Martindale and Supernant (1999:195) somewhat address this complication in the assessment of defensibility with their proposed metrics for accessibility, which they defined as a combination of "approach" (defined as the arc in degrees by which the site can be accessed) and Access (the width of entries through gates or doorways without significant impedance). They assessed the directions from which a site may be approached on a non-explicit, somewhat phenomenological basis, based on their experiences in the field. First, because fortified sites are not circular, and may actually deviate a great deal from such a shape, rather than the degrees of approach I argue that what percentage of a site's perimeter is approachable (and therefore potentially requiring additional investment, e.g. by architecture or the use of sentries, to defend) is more informative. Then, in order to measure accessibility consistently between sites, I used two methods to approximate how readily a person on foot could approach a site, the first being the steepness of the slope of the approach and the second being the ruggedness of the terrain, recognizing that terrain that is sufficiently steep or rugged, even if not entirely impassable would still slow and otherwise hamper attackers sufficiently as to make that direction of approach impractical for attack (Figure 7.2).

The utility and significance of both metrics are highly dependent on the resolution of the digital elevation model available for analysis. Even a relatively high resolution DEM, like the 5m raster used for the present study, will occlude and smooth many features in a region with high topographic relief like that of the Yialias River valley in the Agios Sozomenos region. In addition to slowing movement, the energy cost for a person running or charging upslope increases in a linear fashion with positive slope (Vernillo et al. 2017:624) so that even a 30-degree slope will pose a significant obstacle to approach of a site even if it wouldn't preclude all efforts to access the site from that direction. However, rasterized elevation data and the algorithms used to calculate slope in a GIS means that a calculated "slope" value of 30 degrees produced from a 5m DEM only indicates an average 5 m change in elevation over a distance of 10 m, and not the manner in which that elevation

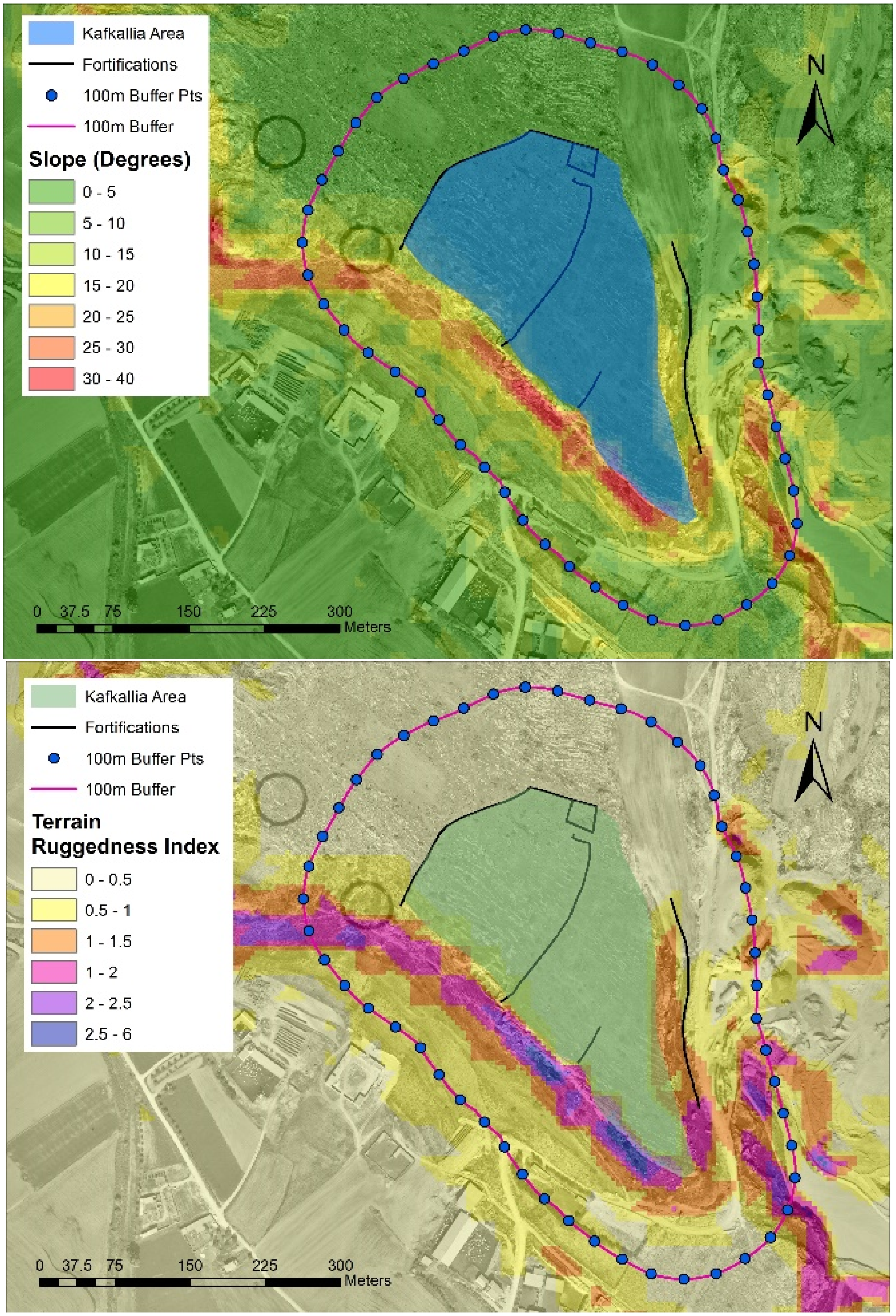

Figure 7.2 - *Maps of the fortress of Kafkallia with Slope (top) and Terrain Ruggedness (bottom). The obstacle to site access presented by the plateau is not as clearly represented in the slope calculations, where only red indicates impassability, as it is in the TRI values, where orange is impassable.*

changed. While a smooth 30-degree slope could be traversed with some difficulty, the same measurement could just as easily represent a 5 m vertical drop occurring somewhere within that 10 m, a feature of the landscape that would in fact be entirely impassable without climbing skills. Therefore, I chose 30 degrees as a conservative threshold of the calculated slope at which a site could no longer be reasonably approached, but an even lower value might also have been justified.

These issues with simple slope calculations are why I also adopted the second method, a Terrain Ruggedness Index (see Appendix B). This methodology, adapted from that developed by Riley et al. (1999), assesses terrain variability over a distance of only 5 m instead of 10 m, and it takes into account different kinds of elevation change, including peaks, bowls, and undulation in all directions, rather than the average trend in elevation change as measured by slope. I also normalized the Index values so they would represent the deviation in height between any one cell and the 8 cells surrounding it, rather than the sum of the deviations, thus making the significance of the index more intuitive. For comparison, the TRI value for a 30-degree slope is .7655, but because shorter distances used in the calculation of TRI vs. Slope, I chose to use a TRI value of 1 (representing a standard deviation of 1 m in elevation between a point and the 8 points surrounding it, a 5 m distance orthogonally and 7 m on the diagonal) as the cutoff point for assessing access in order to ensure that the value truly indicated difficult terrain. As can be seen in Figure 7.2, visualization of both slope and TRI values highlights the presence of the plateau ledges surrounding much of the fortress at *Kafkallia*, but the impact of the terrain on access is more evident with TRI, despite using a higher standard for what qualifies as "rugged."

Using maps prepared with these methods and the 100 m buffer lines around the sites, I calculated the % of approach made inaccessible by the local topography by determining the length of the 100 m buffer perimeter that intersected impassable or terrain or where impassable terrain lay between the 100 m buffer and the perimeter of the site (Table 7.2). The difference between the effects of Slope and the more complicated metric of Ruggedness is best demonstrated by *Kafkallia*, where steep ledges with relatively short drops of only a few meters are obscured by GIS calculations of slope and TRI calculations more accurately detect the rapid changes in elevation over short distances that were capitalized on by the inhabitants to improve the defensibility of their settlement. As discussed in the preceding chapter on the architecture at the Agios Sozomenos fortresses, *Kafkallia* makes the most efficient use of the defensive affordances of the terrain as the portions of the site inaccessible due to topography remained unenclosed. This means that the defensive efficacy of the site was largely dependent on the affordances of the natural landscape, requiring only minimal architectural modification to cut off access from the remaining angles of approach. The location of *Nikolidhes* has greater defensive affordances than *Kafkallia*, as measured by both the steepness of the slope and the ruggedness of the terrain that protect the perimeter of the site. Therefore, it may be argued that the fortress utilized the natural topography to even greater defensive effect, although the builders here were not satisfied to rely on topography alone, and supplemented the entire perimeter with the single enceinte wall (Figure 7.3).

Site	**100 m Buffer Length (m)**	**>30 Degree (m)**	**% High Slope**	**TRI > 1 (m)**	**% Highly Rugged**
Barsak	1488	836	56%	832	56%
Kafkallia	1673	140	8.4%	1121	67%
Nikolidhes	1609	692	43%	1474	92%

Table 7.2 - Lengths of 100m buffer perimeters(in meters) and % of Approach that is thwarted by areas of high slope or high ruggedness.

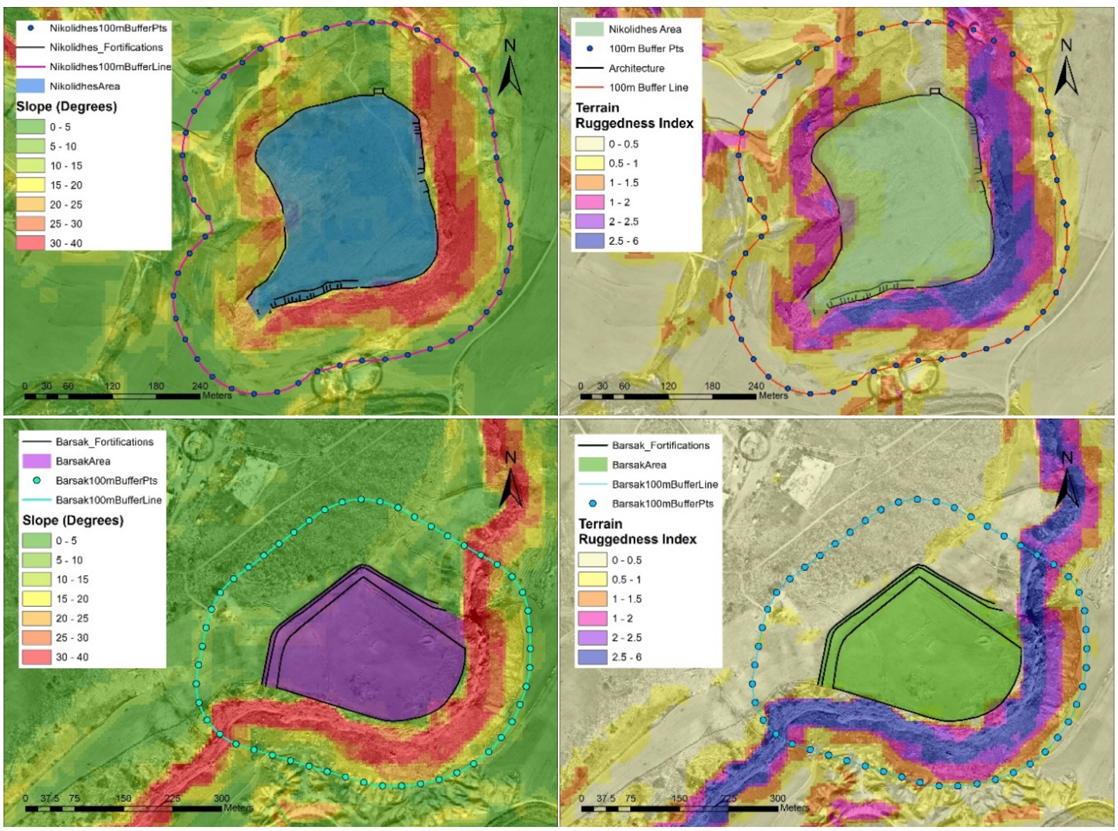

Figure 7.3 - *Maps of Nikolidhes (top) and Barsak (bottom), with visualization of slope in degrees (left) and Terrain Ruggedness Index values in meters (right). The potential difference between slope and ruggedness is visible at Nikolidhes, while at Barsak the exceptionally steep cliffs produce similar patterns in both metrics.*

However, the severe curtailment of the routes of approach by rough terrain makes evident the reasoning for the siting of Nikolidhes single tower structure in the NW of the site, as the builders placed it to look out over the only significant approach to the site not blocked by steep slopes or rough ground. As discussed in the preceding chapter, the tower appears to have been a later addition, requiring the dismantling and remodeling of a portion of the enceinte. This addition, or elaboration, suggests that the builders were not fully aware of the affordances and requirements of the site when they first built the enclosure. Instead, they responded to these forces of the landscape after the site was occupied and their experiences indicated some improvement in the operation of the sites could be gained by altering the architectonics of the enclosure.

Notably, at *Barsak* the cliffs are so steep that the smoothing effects of the DEM do not obscure the obstacle that they pose, and indeed, while the promontories on which *Kafkallia* and *Nikolidhes* are sited can both be climbed by a person in reasonably good condition[1] by clambering awkwardly over massive boulders and up short ledges, the perimeter of Barsak protected by the plateau edge is effectively impassable. Beyond the actual cliffs though, the approach to Barsak across the plateau is completely unhampered by natural defenses, undoubtedly the driving motivation behind the intense three-layer (ditch-wall-wall) enclosure built to bolster the defenses of the site in this direction.

[1] Having done so myself, and with the members of my survey crews.

The area of a site is also a factor in defensiveness as assessed by Martindale and Supernant. Although they acknowledge that smaller sites are more easy to defend than large sites, they conclude that the size of the population supported by a larger site as being more significant, and therefore assign a higher defensibility score to sites of greater area. In an effort to more accurately consider the effects of terrain on defensibility, I adjusted this metric to consider how the shape of the site, as well as the area, might effect defense. In theory, the most efficient shape for site defensibility should be round, as this shape has the smallest perimeter for the largest internal area, and therefore has the smallest ratio of boundary requiring defense to quantities of people, livestock, and goods being potentially defended. However, builders availing themselves of the affordances provided by the topography of the natural landscape will of a necessity deviate from this ideal form. It is therefore informative to consider how much the defensive perimeter of a site deviates from the ideal minimum of a circle that encloses the same area, and then to consider how that deviation is rewarded by increased utility of the landscape. This analytic therefore requires calculation of the area of a site within the defensive perimeter, from which the perimeter of a circle of equal area may be calculated. The resulting ratio of Actual Perimeter:Ideal Circle then provides a metric of divergence from the ideal, which may then be compared to the investment in architecture to complete the defenses of the fortress (Table 7.3).

Regarding the results summarized in Table 7.3, the three large enclosure fortresses at Agios Sozomenos are of strikingly comparable size, despite their very

	Site Perimeter	Site Area	Circle Perimeter	% Deviation	Distance Deviation
Kafkallia	1083	55414	834	30%	249
Barsak	856	50954	800	7%	56
Nikolidhes	983	54370	826	19%	157

Table 7.3 - *Comparison of Agios Sozomenos fortress perimeters (m) and areas (m2). Circle perimeter is the perimeter of a circle of the same area as the site, and % deviation is the difference between the sites actual perimeter and the ideal.*

different architectonics. The similarity in site size might simply be the result of the builders' response to the affordances of the landscape, as all three structures are heavily reliant on the local topography to produce their defensive effect. However, only *Nikolidhes* had the majority of its perimeter surrounded by impassable terrain, and the size of both *Kafkallia* and *Barsak* was not limited by the size of the plateau. Significant investments were made in walls to enclosure the sites, and at *Barsak* beyond those even needed for enclosure, so the builders might just as easily have built the fortresses smaller or larger depending on the community or communities' needs and desires. Thus, the similarity in enclosure size between the sites suggests intentionality. The similarity in area may indicate that the three sites were built successively to contain the same community, or to support multiple communities of the same size. An intriguing third possibility is that, regardless of the size of the communities who built them, an effort was made to keep the sites similar in size in order to minimize competitive comparisons being drawn between them, thus establishing and communicating a regional identity and an intra-communal sense of solidarity and cooperation.

Returning to the perimeter:area comparisons, *Kafkallia* has the longest perimeter for its area, and also has the smallest overall investment in architecture – the fortress is almost entirely reliant on the affordances of the natural landscape. *Barsak* and *Nikolidhes* both make efficient use of the area of the promontories on which they are located, but also demonstrate much greater investments in architectural elaboration both of the portion of the perimeter requiring defense and that overlooking the valley. This is further evidence that the construction of *Barsak* especially, but also *Nikolidhes*, was motivated by a concern with defensive efficacy, and with a mind to taking the best advantage of the affordances of the natural landscape. Given the apparent sequential nature of the construction of the Agios Sozomenos enclosures, the designers and builders of the later sites appear to have learned from *Kafkallia*, where the longer, and therefore less easily defended perimeter, as well as its lower elevation, and less precipitous cliff edges, all provided the site with fewer natural advantages. This must have been a factor in the decision to replace or supplement the settlement with the more impressive, and more defensible, neighboring enclosures. It also supports the hypothesis that *Kafkallia* was not originally built as a fortress, as more defensively advantageous locations were available but were not selected. Instead, *Kafkallia* had some natural defenses, which appear to have been later deemed insufficient to the needs of the community, due to increased population size, increasing frequency or intensity of conflict, or most likely a combination thereof.

Turning from Supernant and Matrindale to consider other categories of evidence for violence and the adaptation of settlements to conflict, access to water is another important consideration in defense and occupation highlighted by Leblanc in his study of the American southwest. Notably, none of the Agios Sozomenos forts have water sources within their walls, with the exception of the well in the courtyard of the blockhouse at *Glykia Vrysi*, nor were there cisterns found during survey. Historic maps indicate that there were perennial streams atop the plateau, and although they have now been destroyed by mining activity, their locations are actually still visible in the landscape by the holding ponds and tanks built to manage them. These modern features and the historic maps suggest that water was readily available – all three forts are within 500 m of holding pools built by the sand-mining operations to contain the remains to the springs. This water might not have been sufficient to support large, permanent occupations, perhaps one reason for why Barsak and Nikolidhes do not contain evidence of domestic architecture, but the springs could still have served to water livestock and fill storage pithoi, expanding the functional potential of the enclosures to more regular and diverse social and economic uses than as only infrequent and short-term emergency refuges.

Even without internal water sources, certainly the appearance of these three structures in immediate proximity to each other within a short time-frame does align with Leblanc's proposed pattern of rapid site construction, site clustering, and sequential site abandonment as evidence of warfare. Rapid construction of sites and clustering of sites can also be identified in the settlements in the valley below the plateau. During the ASESP regional survey in 2016, 11 Bronze Age sites identified as settlements were visited and recorded in addition to the three fortresses. Five additional Bronze Age settlements were recorded in the region by previous surveys, but we were unable to relocate them. The dating and locations for the sites recorded by Hector Catling in the Cyprus Survey are tentatively accepted, but are of a necessity imprecise[2]. Reliance on ceramic material from survey for chronological data is also not ideal, as earlier occupations may not be well represented on the surface, and most Cypriot ceramic wares were in use for more than one phase. Taking these factors into account, the settlements in the survey area were classified by whether they were occupied during the Middle Cypriot (prior to the MCIII, Red Polished wares predominate, no LC wares), MCIII (possibly extending into LCIA, Red Polished IV, Red Slip/Black Slip, and White Painted wares, Plain White only as storage jars), and LC (LCI-LCIIC, Plain White wares of all forms, Base Ring and White Slip wares). When the settlements are mapped according to these temporal groupings, the results show sites that were likely occupied concurrently and

[2] The most southeasterly site, Potamia *Ambelin*, was relocated but could not be surveyed because heavy cultivation and manuring had reduced visibility to near zero. Catling reportedly recovered RP ware, suggesting an EC/MC site, and a couple sherds of WS, which would be indicative of LCIA2 or later. Whether these few later sherds indicate an actual LC occupation in unknown and there were no reported MCIII wares or PW, which one would expect of an LC settlement. Dhali *Meloutzia*, the site due south of *Glykia Vrysi*, was a small dense ceramic scatter with high prevalence of fine wares and little evidence for architectural debris, so it may be the remains of a tomb or cemetery. The dating for the occupation of *Vathia Gonia* is also problematic, as the only potentially LC wares recorded by Catling were PW pithos, which was already present in the MC.

potentially interacted with each other, and reveal how the pattern of settlement in the region changed through the Middle to Late Bronze Age transition (Figure 7.4).

During the earliest phase there was little occupation in the valley, and it was widely distributed. The southernmost sites, Dhali *Meloutzia* and Dhali *Agios Demetrianos*, were very small, possibly only one homestead. The remaining sites are well distributed, the only two that would have been able to see each other in the landscape being *Galatere*, below *Barsak*, and Potamia *Ambelin* to the south across both the Yalias and Alykos rivers. The second phase, when there is evidence for the occupation of the fortresses at *Nikolidhes* and *Barsak*, the number of sites in the valley increases from 5 to 9. The block house fort at *Glykia Vrysi* and the surrounding settlement appears below *Nikolidhes*, while a new cluster of occupation grows directly below *Barsak*. This concentration and expansion of settlement continues in the Late Cypriot Bronze Age. The sites below *Barsak* become part of one large complex, called *Ambelia*, that covers nearly 20 hectares, and *Glykia Vrysi* grows to cover over 6. The settlement agglomeration seen follows the patterns of population growth and site clustering anticipated in periods of conflict as proposed by Leblanc.

The fortresses were also clearly a significant factor in the development of this pattern, as the settlement clusters grow in close proximity to the newly built enclosures at *Barsak* and *Nikolidhes*, while the more distant settlements are abandoned (Table 7.4). The settlements that grew directly below the plateau had direct access to the rivers and the fertile farm land and communication associated

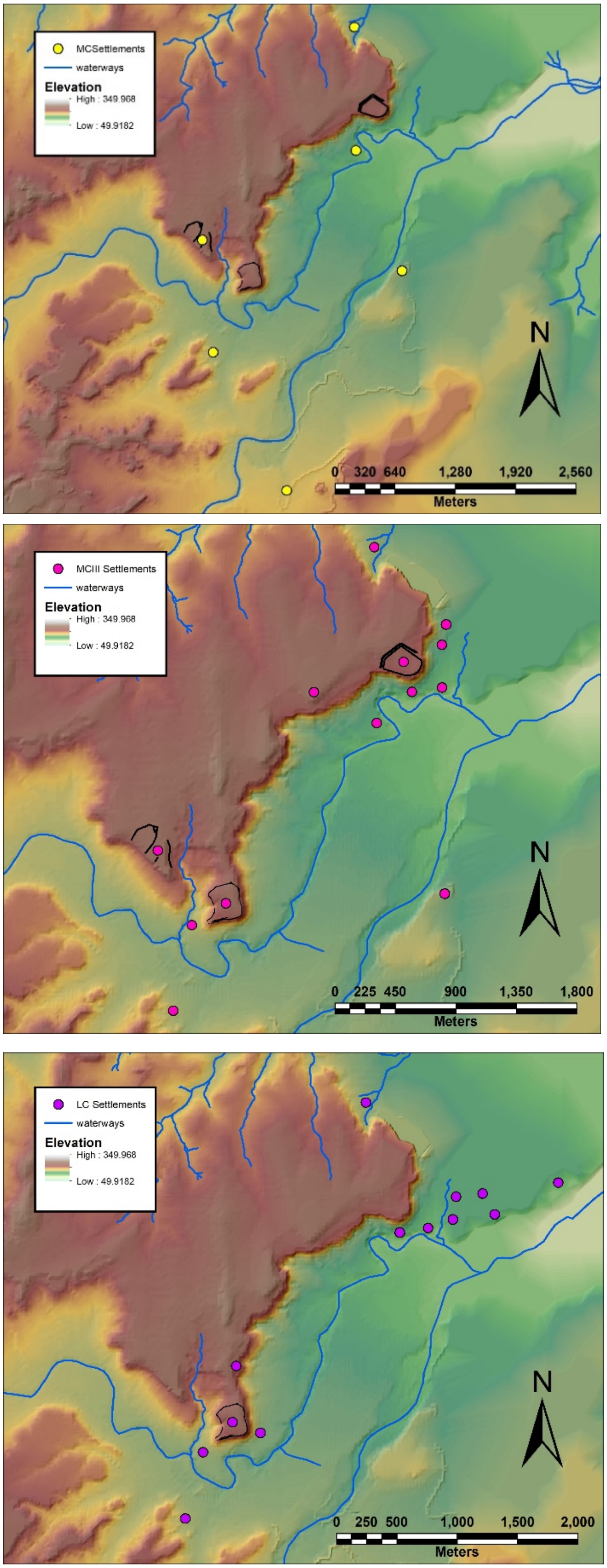

Figure 7.4 - *Maps of MC (top left), MCIII-LCIA (top right), and LC (bottom) settlement patterns of the Yalias River valley in the region surrounding Agios Sozomenos.*

	Site Type	Condition	Occupation	Distance to Nearest Fortress		
				MC	MCIII-LCI	LC
Nikolidhes	Small Settlement	destroyed	LC	---	---	406
Gykia Vrysi	Settlement	surveyed	MCIII-LC	---	347	347
Dhali *Meloutzia*	Small Settlement	surveyed	MC-LC	1194	888	888
Teratsies	Small Settlement	surveyed	LC	---	---	248
Galatere	Settlement	surveyed	MC-MCIII	1884	495	---
Kakoskalin	Settlement	located	MCIII-LC	---	231	2093
Kokkines	Activity Area	surveyed	MCIII	---	704	
Vathia Gonia	Settlement	destroyed	MC-LC	2770	880	880?
Djirpoulos-Ambelia	Settlement	excavated	MCIII-LC	---	344	2293
Bezinargos	Settlement	destroyed	MCIII-LC	---	421	---
Ambelia West	Settlement	excavated	LC	---	---	2480
Ambelia East	Settlement	surveyed	LC	---	---	2805
Kamini	Settlement	surveyed	LC	---	---	2796
Kafkalla tis Drakontias	Settlement	unlocated	LC	---	---	3369
Potamia *Ambelin*	Settlement	located	MC -LCI?	2142	1630?	
Dhali *Ayios Demetrianos*	Small Settlement	unlocated	MC	2812	---	

Table 7.4 - Settlements in the Agios Sozomenos study region, with condition, occupation phases (MC, MCIII/LCI, LC – subdivisions of MC and LC are not otherwise taken into account), and the euclidean distance (in meters) from the settlement to the closest fortress during each period of occupation. Question marks indicate that it is uncertain whether the site was occupied during that phase.

with them, certainly more convenient access than they would have had from atop the plateau, but the settlements were still located so they might potentially benefit from the defensive affordances of the fortresses above. During the MC, the average distance between the occupied settlements in the region and the fortified enclosure at *Kafkallia* is more than 2 km. Possibly the fortification at *Kafkallia* was only built and used by the residents of *Kafkallia* itself, leaving the other villages in the region relatively defenseless. The undefended villages in the valley could be a reason for the construction of the outer (possibly a later expansion) enclosure at *Kafkallia,* where fewer architectural remains were recorded. In the MCIII, with the construction of the enclosures at *Barsak* and *Nikolidhes*, and the abandonment of the more distant settlements at Dhali *Agios Dhemetrianos* and Potamia *Ambelin*, the average distance to a fortress from settlements in the valley drops to just over half a kilometer.

In the LC, however, the pattern reverses somewhat with there no longer being evidence for the continued use of *Barsak* or *Kafkallia*. With Nikolidhes as the only fortress in use, the cluster of settlements in the south maintain an average distance of just 500 m, but the sites of the settlement complex at *Ambelia*, and *Vathia Gonia* and *Kafkalla tis Dhrakontias* are an average distance of more than 2 km from Nikolidhes. As a massive structure, it is likely that *Barsak* was still standing well into the LC and could potentially have been pressed into use if needed, but survey and excavation evidence suggest this did not occur often enough to leave artifactual evidence. The evolution in the spatial relationships between settlements and fortifications is thus indicative of the changing reliance of the domestic population on the defensive affordances of the enclosures, and of the evolving efficacy of the defensive apparatus of landscape, fortification and village. Proximity to the fortified enclosures and other settlements would enable rapid communication between sites and retreat to the enclosures in situations of threat.

These measurements use Euclidean distance, or distance measured "as the crow flies." They give a sense of how physically close two sites are, which also effects the perception of proximity. For example, people in the area of Djirpoulos-*Ambelia* would be able to look up and see *Barsak* "just over there," and their experience of having visited certain locales repeatedly would provide them with a mental map of their region a sense of how close neighboring settlements and resources, including the defensive resources of the fortresses, were. However, these measurements do not accurately reflect the lived experience of physically negotiating and moving through the landscape, because proximity does not necessarily reflect accessibility. In regions of high relief, like the foothills of the Troodos Massif and the plateaus of the central Mesaoria, the local topography can greatly affect speed of movement and choice of route taken.

GIS software can be used to model potential routes through a landscape and the time it would take to traverse them by means of Cost Surfaces. By providing appropriate inputs a cost surface raster indicates the cost of crossing any given point on the landscape. A Path Distance function then uses such a cost surface, with the addition of other horizontal or vertical parameters to account for factors such as slope or wind direction, to model the cost of traveling to any point in the landscape from an origin, allowing the system to account for the effects of direction. Tobler's Hiking Function (Tobler 1993) provides the speed of walking as a function of slope, which I applied as a vertical parameter factor for the Path Distance model, allowing the Path Distances to be calculated in minutes walked. A Least Cost Path function then uses the same data to model the most efficient route through the landscape between the two points (e.g. Figure 7.5).

Another important consideration for mapping transportation routes, particularly for the Bronze Age and for an agro-pastoral economy like that of the Agios Sozomenos region would be the movement of livestock. Goats can and will climb almost vertical slopes, but cattle avoid walking on >25 degree slopes (Sheath and Carlson 1998:276) or even >20 degree slopes (Gillen, Krueger, and Miller 1984:551), and avoid grazing on >10 degree slopes (Mueggler 1965; Cook 1966). Therefore, in order to approximate paths that would have been preferable to humans and cattle alike a model should exclude movement across pixels with a

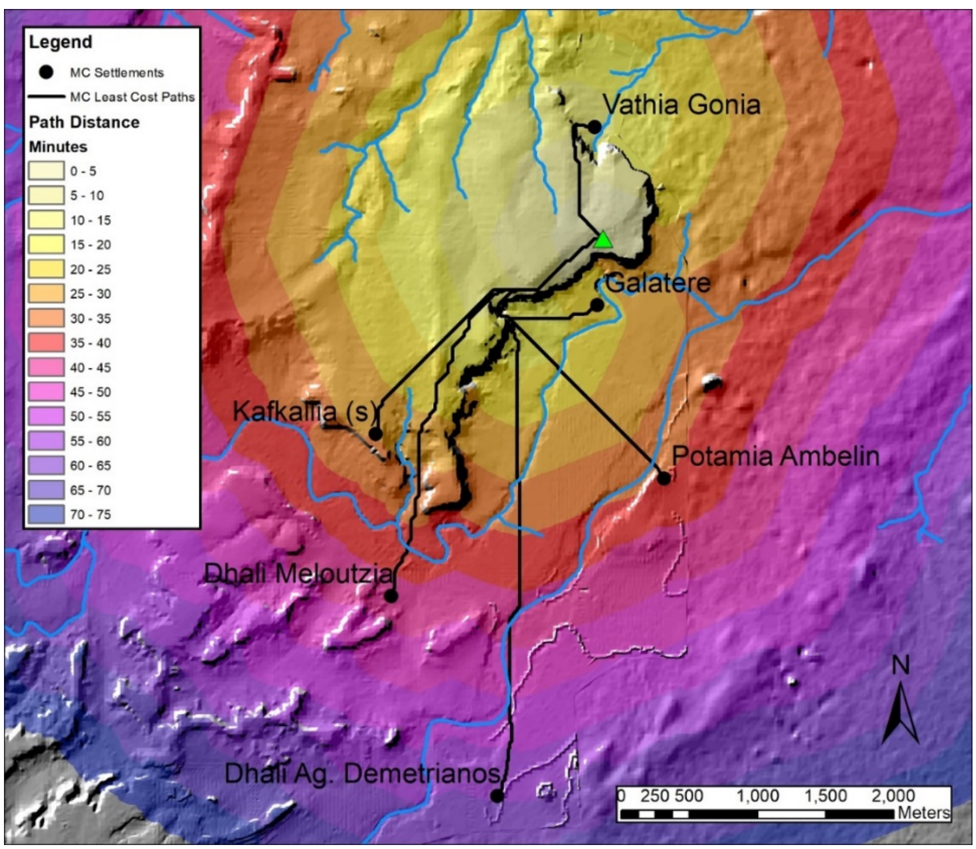

Figure 7.5 - *Path Distance raster for Barsak with Least Cost Paths for MC settlements, with the cliff path incorporated into the model.*

vertical angle of movement greater than 20 degrees. This exclusion was supported by another available metric for human foot-based movement, which is the average pace for hiking trails in the US national parks. The National Park Service Trails considers trails "strenuous" or "very strenuous" that have an expected average speed of 1.2 mph, or 2 km/h. This aligns with the speed/pace expected on a 20 degree slope according to Tobler's Hiking Function. I would expect that regular, not recreational, travel should not exceed conditions considered "strenuous," and so the 20 degree vertical angle of movement exclusion is supported. A similar threshold was used by Katherine Jarriel (2017) for producing transportation routes in the Bronze Age Cyclades, where rough terrain is similarly difficult to accurately represent with Digital Elevation Models.

As a last step, I modified the cost surface to allow for passage along the path cut into the cliffs behind the village of Agios Sozomenos, a path which is otherwise too small to appear in the Digital Elevation Model. Use of these tools then permitted the modeling of travel times and routes from the fortresses on the Agios Sozomenos plateau to the settlements in the valley, which are summarized in Tables 7.5-7 (see Appendix B for complete methodology), and an example of MCIII routes is visualized in Figure 7.5. These results make it possible to compare empirically the relationship between the evolving settlement pattern and the utilization of the

Site Name	Time to Kafkallia	Time to Barsak	Time to Closest Fort
Vathia Gonia	35	13	13
Galatere	28	23	23
Potamia *Ambelin*	34	36	34
Dhali *Meloutzia*	17	42	17
Dhali *Ag. Demetrianos*	38	60	38
Avg. Time from All Sites	30	35	
Avg. Time from Closest Sites	30	18	25

Table 7.5- Travel times (in minutes) from sites with MC occupations to the fortresses. Best travel times associated with Barsak in blue, with Kafkallia in yellow.

Site Name	Time to Nikolidhes	Time to Kafkallia	Time to Barsak	Time to Closest Fort
Vathia Gonia	37	35	13	13
Bezinargos	41	39	25	25
Kakoskalin	35	33	28	28
Kokkines	23	21	8	8
Galatere	30	28	23	23
Djirpoulos-Ambelia	37	35	29	29
Potamia *Ambelin*	30	33	36	30
Glykia Vrysi	7	10	34	7
Meloutzia	15	17	42	15
Avg. Time from All Sites	29	28	26	
Avg. Time from Closest Sites	18		21	20

Table 7.6 - Travel times (in minutes) from settlements with MCIII occupations to the fortified enclosures. Best travel time to Barsak in blue, and to Nikolidhes in red.

Site Name	Time to Nikolidhes	Time to Kafkallia	Time to Barsak	Time to Closest Fort
Vathia Gonia	37	35	13	13
Bezinargos	41	39	25	25
Ambelia (West)	42	40	27	27
Kafkalla tis Drakontias	52	51	35	35
Kakoskalin	35	33	28	28
Djirpoulos-Ambelia	37	35	29	29
Kamini/Ambelia (East)	45	43	31	31
Nikolidhes	4	4	28	4
Teratsies	13	15	33	13
Glykia Vrysi	7	10	34	7
Dhali *Meloutzia*	15	17	42	15
Avg. Time from All Sites	30	29	30	
Avg. Time from Closest Sites	10		27	21

Table 7.7 - Travel times from settlements with LC occupations to the fortresses. Best travel times associated with Barsak in blue, with Nikolidhes in red.

fortresses, while still taking into account the capabilities of human actors and the affordances and limitations imposed by the topography of the local landscape.

During the MC, all known occupations in the valley together had an average travel time to the fortress at *Kafkallia* of approximately half an hour. The travel times to *Barsak*, which were also calculated, provide a possible explanation for the construction of the new enclosure sometime later in the MC – namely that two of the settlements with the longest travel time to Kafkallia would have had their journey to the protection of a fortified enclosure cut from 32 minutes to just 18, a 43% reduction in travel time. This is a significant improvement especially when the goal is to relocate a population and their valuables quickly in times of danger. This was also likely when the path in the cliff behind Agios Sozomenos was cut, as it provides vital access to the plateau from the settlement at Galatere and the fertile floodplain between the two rivers, which was likely prized farmland for the surrounding settlements. Exploitation of this farmland would be more convenient from the settlements east of the plateau, but their access to Kafkallia was limited by the very components of the landscape that provided much of the defensive affordances The construction of Barsak and the cliff path were thus the response of a growing population to their desire for access to the resources of the valley and to the continued access to affordances of a fortified enclosure like that at Kafkallia, and stark evidence of the population's dependence (whether actual or psychological) on the defensive efficacy of the forts during the MCIII. . In fact, after the construction of *Nikolidhes* and *Barsak* later in the MC, *Kafkallia* was no longer the closest fortress to any of the settlements occupied in the valley. These settlements were also significantly closer to the river and agricultural land than *Kafkallia*, which may have driven the abandonment of *Kafkallia* in their favor. With *Nikolidhes* complete and the settlements furthest from the plateau abandoned, the average travel time from a settlement to a fortress dropped to only 20 minutes, strong evidence that ready access to the enclosures was a priority when choosing where to live.

Travel times from settlements to fortified enclosures change again during the Late Cypriot. Settlements in the south stay close to the plateau and the route up to *Nikolidhes*, but in the north as the settlement complex at *Ambelia* expands, the travel times to the potential defensive positions on the plateau increase, so that the farthest outpost at *Kafkallia tis Drakontias* is 35 minutes from *Barsak*. However, there is no artifactual evidence for the continued use of *Barsak* during this period, in which instance the travel time from *Kafkallia tis Drakontias* to *Nikolidhes* is nearly an hour. *Barsak* most likely could have still been used as a defensive refuge if necessary, so its lack of apparent use, and the increasing distance of the settlements from the any of the enclosures, suggests that during this phase rapid access to the plateau and the enclosures was no longer a major concern, and in turn, this indicates that the regular fear of violent attack had largely passed.

In this section I laid out how the overall defensive efficacy of the Agios Sozomenos fortress apparatus was the product not just of the fortress architecture, but of the affordances of the local topography, the location of the settlements and resources in the valley below, and the interactions of the various components of the landscape and the structures. The people of the communities in the region located the fortresses to make maximal use of the affordances of the elevation and rugged terrain, while preserving access to water sources on the plateau, and it appears that they subsequently relocated and expanded their settlements so as to improve their access to the fortresses and to the resources of the valley. The increase in the number and size of settlements in the MCIII indicates an increase in the regional population, quite possibly attracted by the safety offered by the presence of *Kafkallia*, and resulted in dense clustering of settlements in a relatively small geographic area surrounded by an approx. 5km buffer zone with almost no known bronze age occupation[3]. The increasing population required the construction of additional defensive capacity and access to more farmland, which was provided by the construction of *Barsak* and later, *Nikolidhes*.

Thus the efficacy or the *perceived* efficacy of the defensive apparatus drove its continued reproduction and expansion. The inhabitants of the Agios Sozomenos region were materially and socially entangled with the fortresses that they had built, and the materials were shaping their choices. These successive iterations of the defensive apparatus provided opportunities for experimentation and elaboration, as seen in the architectonics of the later enclosures and their more efficient use of the defensive affordances of the landscape. This strategic elaboration of the fortress apparatus enabled the expansion of the settlement pattern in the river valley below.

The advantage in elevation provided by the plateau also provided the enclosures with enhanced visual access to the surrounding territory, an important defensive affordance that would provide advanced warning of impending attack and opportunity for communication between the occupants of the fortresses and settlements. These visual affordances provided by the landscape, and their

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[3] There are almost no other recorded settlements within 5km of those discussed as part of the Agios Sozomenos region. The MC settlement at Alambra *Mouttes* is located 8.5 km SW of Agios Sozomenos, and has no evidence for occupation past the MCIII. There are possible MC cemeteries with MCIII material recorded in Latsia, 6 km NNE, but no known associated settlement (Catling 1982; Georgiou 2007: site 211, 212). A significant exception, however, are the two small "fortified" sites at *Vrysi tis Pantelous* and *Phoenikes* in the village lands of Yeri (Georgiou sites no. 199 and 200), in the valley NW of the Agios Sozomenos plateau. There is also a possible settlement and cemetery (Georgiou site no. 198) recorded in this valley, but it was not relocated during the 2016 survey, and Georgiou notes that it may be duplicate of the fortified site at *Phoenikes* (Georgiou 2007: 275).

applications to defense, will be discussed fully in the next section on the monumentality of the fortresses in the landscape.

Monumental Landscapes: Prominence and Communication

> Monuments serve as unambiguous markers of social relationships, not only because of their scale, but because of their functional unity and visual prominence. The key to monuments, following Lynch (1960), is their *imageability* and *legibility:* their capacity for conveying meaning and the clarity with which meaning can be read. (Moore 1996:97)

Having explored and established the monumental nature of the architecture of the enclosures at Agios Sozomenos in the previous chapter, this section investigates how landscape contributes to the sense and experience of monumentality associated with fortresses. Following Lynch and Moore, I demonstrate that the affordances of the landscape were used to increase the potential for the fortresses to communicate, both literally and metaphorically, across large distances by heightening their imageability and legibility. Imageability is the ability of the environment to evoke memory, organize activity and communicate other social messages, while legibility is the clarity with which these messages are understood (Lynch 1960; Moore 1996; Llobera 2001; Fisher 2007). The main factor in this enhancement of monumentality is spatial prominence, a concept that encompasses both visual prominence and topographic prominence. Lynch (1960: 80) observed in his study of imageability and legibility in cities that, "spatial prominence can establish elements as landmarks in two was – by making the element visible from many locations… or by setting up a local contrast with nearby elements, i.e. a variation in setback and height." As with the architecture of fortresses, where the same architectonic features contributed to both the defensive and monumental efficacy of the structures, the features of the landscape that are factors in the defensibility of the fortress sites also served to established the sites as landmarks. Visual prominence and the accompanying expanded viewshed are also significant contributions to the defensive capabilities of the fortress apparatus. Monumentality is also a product of topographic prominence, which I will demonstrate is closely related to, but not wholly the same, as visual prominence.

Marcos Llobera (2001:1007) refers to topographic prominence as "a function of the height differential between an individual and his/her surroundings as apprehended from the individual's point of view. More precisely, it is defined as the percentage of locations that lie below the individual's location…within a certain radius." Because terrain may be uneven and change significantly over different distances and scales, prominence is inherently relative, dependent on the length of the radius chosen and thus the area considered, and therefore it is important to consider how prominence changes at different distances (Figure 7.6). Llobera also observes that topographic prominence plays a role in hierarchy, rank, and significance in the landscape, as there is often symbolic significance related to vertical scale (and I would suggest overall mass as well).

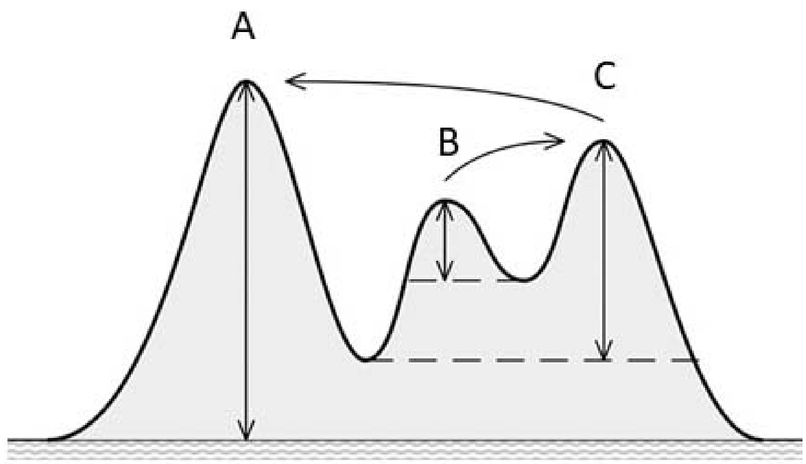


Figure 7.6 - Topographic prominence relative to distance. Standing atop Peak B, at a small radius peak B is most prominent within its locality. At a larger radius Peak C becomes most prominent, and at the largest radius, Peak A is. Image reproduced under CC BY-SA 3.0, copyright Wikimedia Commons user Cmglee - https://commons.wikimedia.org/w/index.php?curid=46385403.

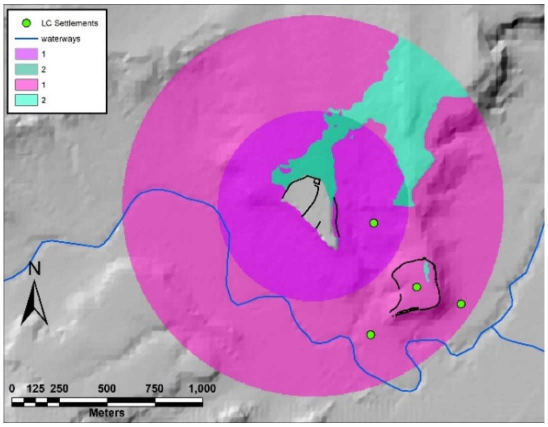
Llobero also cites Tadahiko Higuchi (1983) who in his study of "Domain-Viewing Mountain Type" Japanese shrines, observes that prominence conveys to the viewer "a sense of power and authority over all he surveys." In this sense, prominence is also linked to visual and spatial control and as such plays a role in the exercise of disciplinary power as well. This sense of dominance and scale is an important distinction between topographic prominence and visual prominence, as visual prominence is a measure of relative visual access, and it is possible for a location to have high visual prominence, but low topographic prominence (e.g. a location at the base of a wide valley or bowl, which might be able to see much of the surrounding landscape). Higuchi's work, although focused primarily on the natural landscape settings of Japanese religious architecture, is also used by Jerry

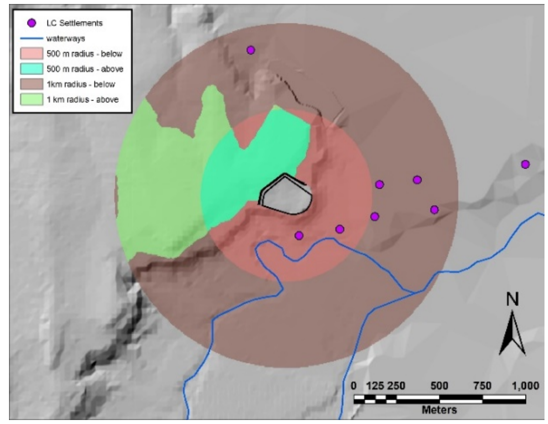
Moore (1996:97) in his study of Andean monumental architecture, precisely because he, "emphasizes the viewer's perception and the cultural significance of point of view," and because he provided, "a clear methodology for transforming ideas about landscape into measurable properties of physical forms." Specifically, Higuchi (1983:183), inspired by Jerry Lynch's (1960) *The Image of the City,* identifies four ideal qualities of landmarks, which are equally applicable to monuments:

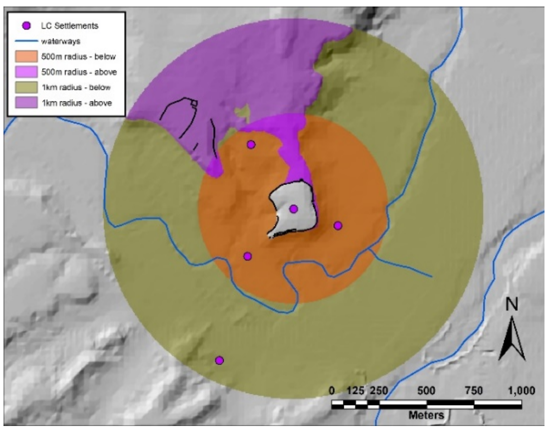
1) they have clear forms
2) they contrast with their backgrounds
3) they are prominent
4) they have "sufficiently solid mass to emphasize their presence"

Prominence here refers both to visual prominence, meaning visibility from many locations (Lynch 1960: 80), and functional prominence, meaning importance granted through special or frequent use (1960: 50). However, I wish to also consider the issues of mass, contrast, and vertical aspect, with vertical aspect having previously been also adopted as a metric by Moore.

First, I prepared a simple assessment of topographic prominence as proposed by Llobera (2001). I established 500m and 1km radius circles around the central points of the fortress enclosures, and then calculated what percentage of the landscape outside the enclosure was below the enclosure elevation, and what the average elevation was of the landscape below the enclosures (Figure 7.7). It is little surprise that the fortress enclosures have high measures of topographic prominence by this metric. As measured within either radius, the locations of the enclosures







	Enclosure Elevation (m)	% below (500m)	Avg. Lower Elevation (500m)	% below (1000m)	Avg. Lower Elevation (1000m)
Kafkallia	245	89%	225	91%	213
Barsak	235	68%	225	79%	187
Nikolidhes	233	91%	200	83%	194

Figure 7.7 - *Visualization of prominence of fortress enclosures at 500m and 1000m radii, with table of prominence calculations.*

stand above no less than 2/3 of the surrounding landscape. The fortified village at *Kafkallia* is located on the highest point on the southern side of the plateau, made even more prominent by its location adjacent to gully cut by the Glykia Vrysi spring running between *Kafkallia* and *Nikolidhes*. The prominence of *Nikolidhes* and *Barsak* on the other hand is enhanced by their location on promontories that jut outwards from the main body of the plateau.

Considering prominence as a measure of vertical aspect, Moore (1996:98-100, using the methods, but not the terminology of Higuchi 1983: Ch. 4) argues that as a person approaches a structure, it takes on monumental nature when the angle of elevation (the angle to view the highest point of the structure) exceeds 18 degrees, as this is the approximate angle at which one is forced to move the angle of one's neck in order to comfortably look up to take in the whole structure. With *Barsak* rising on average 45-50m (including the walls) above the surrounding landscape, and Nikolidhes 35-40m, by this metric the combination of architecture and promontory on which they sat would appear monumental at distances as far as 150 m and 100 m from the plateau respectively. Although most of the settlements in the valley (*Teratsies* and *Kakoskalin* are the only exceptions) are outside this distance, movement through the valley would bring residents of the communities within these boundaries with some frequency, especially while travelling between the valley and the enclosures themselves, and thus providing regular opportunities for the scale of the landscape and architecture to be impressed on the viewers.

Higuchi uses a similar methodology to Moore's, but to assess the effect of mountains on communities that live within sight of them. While it is not clear whether these effects are universal or culturally predicated (or most likely some mix thereof) this perspective helps us to consider the effect that the plateau would have had on the Bronze Age Cypriots who lived in the villages of the valley. Higuchi states that, "When the elevation angle is in the range of 8 to 10 degrees, the mountain is valued because of its appearance as a mountain. In cases where the elevation angle is lower than 5 degrees, it functions more as a variation in the skyline. If the elevation angle is much higher than 15 degrees, the mountainside becomes a more important element than the mountain as an entity… where the angle of elevation of the neighboring mountain is between 23 and 31.5 degrees, one has the feeling that one is confronting an immensely steep barrier.” (Figure 7.8)

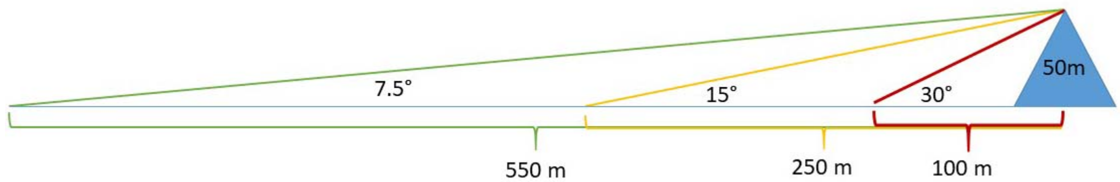


Figure 7.8 – *Schematic demonstrating Angles of Elevation for viewers of a hypothetical 50m mountain at different distances.*

The “Construct Sight Lines” functionality of ArcGIS enables the calculation of angles of elevation along sight lines between points, which I used to investigate the relationship between the villages and the enclosures using the divisions similar to those proposed by Higuchi (Table 7.8). These calculations were made using sightlines between the center points of the settlements as identified through survey and the nearest points on the enclosure boundaries. The angle of elevation would be higher or lower depending on your location within the settlement and do not account for the plateau as a whole, but the angles give a sense of how the presence of the plateau and the enclosures would be felt at different locations in the valley. The data indicates that as one moves through the valley the plateau would transition from location on the horizon, to dramatic feature, to looming presence. Although the labor that went into the construction and the mass of the architecture both

Fortress	Village	Angle of Elevation (degrees)	Distance (m)
Barsak	*Ambelia East*	5.4	619
	Ambelia West	8.7	387
	Bezinargos	16.2	190
	Djirpoulos-Ambelia	14.7	251
	Djirpoulos	9.5	323
	Kamini	4.7	718
	Kafkalla tis Drakontias	2.9	1254
	Dhali *Agios Demetrianos*	0.5	4071
	Galatere	8.3	419
	Kakoskalin	24.6	128
	Potamia *Ambelin*	1.6	1645
	Teratsies	1.3	2100
Kafkallia	Dhali *Agios Demetrianos*	1.1	2637
	Glykia Vrysi	6.5	527
	Meloutzia	3.2	1037
	Nikolidhes Farmstead	6.1	241
Nikolidhes	Dhali *Agios Demetrianos*	1.0	2188
	Meloutzia	3.1	860
	Teratsies	22.8	129
	Glykia Vrysi	11.5	174
	Djirpoulos Ambelia	2.0	2136
	Djirpoulos	1.5	2497
	Galatere	2.6	1606
	Kakoskalin	2.0	1953
	Kamini	1.5	2643
	Kafkalla tis Drakontias	1.3	3225
	Nikolidhes Farmstead	3.4	331
	Potamia *Ambelin*	2.1	1585

Table 7.8 - Angles of Elevation between Bronze Age settlements and plateau enclosures in the Agios Sozomenos region. Yellow indicates >5 degree angles. Red is > 15 degrees.

grant a certain monumentality to the enclosures, the walls were likely only a few meters high, which would only appear imposing at very close range. The plateau, on the other hand, was always visible, and its natural mass and height provided affordances that served to significantly enhance the monumental presence of the enclosures atop it.

In addition to relative elevation and angle of elevation as aspects of prominence, the elevation of the Agios Sozomenos plateau also would have granted the enclosures one of the other ideal qualities of landmarks as proposed by Higuchi, namely that of contrasting with their background. Built of local stone and mudbrick, it is uncertain how well the architecture of the enclosures would have stood out against a background of the local terrain. Plastering with local limestone or gypsum would potentially create a brilliant white color that would be visible over great distances, while improving the durability of mudbrick walls. There is evidence for such plastering in Bronze Age settlements, but none presently from the fortresses. However, the very nature of the enclosures' location atop and at the edges of these high promontories meant that any approach from the river valley below would set the fortresses in silhouette against the sky, greatly increasing their visibility regardless of the surface treatment of the walls (Figure 7.9). The presence of defensively unnecessary walls at *Barsak* and *Nikolidhes* (as discussed in Chapter 6) atop the cliffs was almost certainly intended to take advantage of and enhance this effect.

Figure 7.9 - *Mockup of how 5m high whitewashed walls at Nikolidhes might appear if viewed from the locale of Glykia Vrysi. Note the herd of sheep at the base of the cliff.*

Elevation and prominence are closely related, but not elevation is not the only feature of the plateau that would have contributed to its role as a landmark itself and the affordances it produced for the monumental efficacy of the structures atop it. Lynch, Higuchi, and Moore all observe that mass is a significant factor in the imageability of a landmark. The plateau at Agios Sozomenos is certainly massive, a characteristic that would have been further emphasized by the constrictions of the river valley and the location of the settlements within it. As with other features of topographical prominence, mass is experienced visually but is not synonymous with visual prominence. To consider the effect of mass, I also considered how large the plateau would appear horizontally from different points in the valley, by measuring the horizontal angle of aspect. This measurement is complementary to the vertical angle of elevation measure previously discussed. The angle of elevation, however, is primarily dependent on the distance from the plateau, while the horizontal angle of aspect varies both with distance and with the angle of approach, and is therefore dependent on the highly variable topography of the valley as it opens onto the Mesaoria plain to the west. A locale is also going to be prominent if it "sticks out" from the mass of the plateau from the angle of view. In order to measure the effects of the mass of the plateau I chose two points each along the three main access routes to the study region – from the west, along the Alykos River; from the south, along the Yalias River; and from the eastern Mesaoria, on the Yalias. My intention was to see how the valleys and other topographic features including smaller plateaus and hills, would affect the appearance of the plateau. Angles of view were confirmed with viewshed analyses, and the results are illustrated in Figure 7.10.

Point 1 on the southern and western routes marks the first position along the rivers where the plateau *and* a portion of an enclosure was visible. Point 1 on the eastern route is arbitrary, as the plateau is potentially visible for a great distance dependent on weather conditions (see the following discussion concerning visual prominence). The measured angles of horizontal aspect (summarized in Table 7.9) demonstrate how the local topography constrains the view of the plateau as it is approached from the west and south, but also how rapidly the plateau grows in size

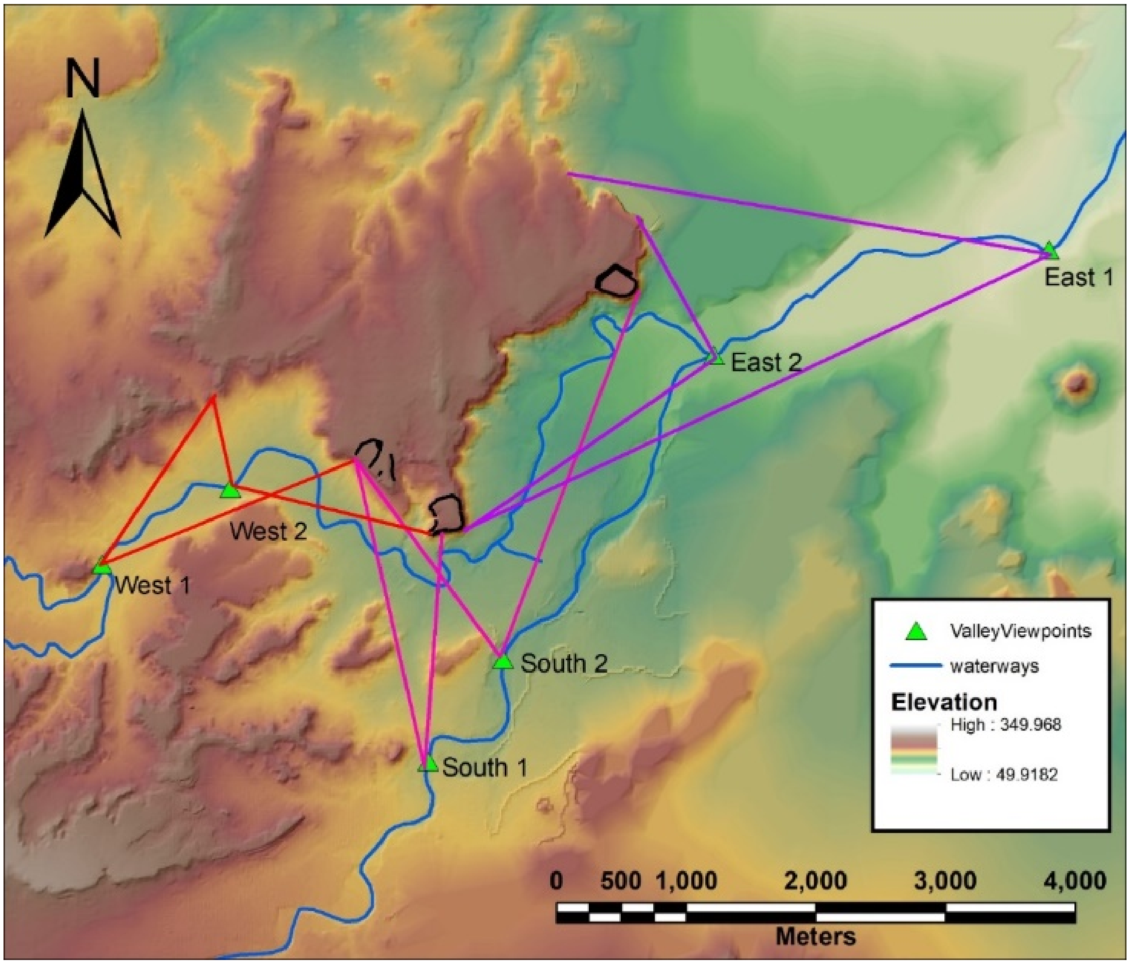


Figure 7.10 - *Illustration of the horizontal angle of aspect from key points on the major routes into the Agios Sozomenos region of the Yalias River valley.*

Viewpoint	Horizontal Angle of Aspect	Fort(s) visible
West 1	33	Kafkallia
West 2	111	Kafkallia, Nikolidhes
South 1	15	Kafkallia, Nikolidhes
South 2	55	Kafkallia, Nikolidhes, Barsak
East 1	34	Nikolidhes, Barsak
East 2	95	Nikolidhes, Barsak

Table 7.9 - Summary of Horizontal Angle of Aspect of the Agios Sozomenos Plateau as approached along different routes.

as one proceeds along the river to the second points. The visualization of the angles in Figure 7.10 also highlights how Kafkallia, Barsak, and especially Nikolidhes capitalize on the horizontal mass of the plateau and the access routes into the valley to maximize their prominence, as the enclosures themselves mark the edges of the maximum horizontal views. The mass of the plateau is inescapable, but the enclosures are situated not so as to hide against the plateau, but to stand out from it.

Blanton (1989:413) in his study of Mayan monumental architecture in the Oaxaca Valley observed that, "as a communications media, monumental architecture is actually relatively efficient. The initial costs of construction may be great, but once built a massive building or plaza can be seen by thousands of people over great lengths of time." Having considered both the horizontal aspect (mass) and vertical aspect (angle of elevation) of the plateau and the affordances it grants to enhancing the prominence of the enclosures, I now turn to assessing the visual prominence of the fortresses, or in other words how visible they were in the landscape. An important affordance of visual prominence is, as Blanton observed, efficiency in communication, but Blanton considered exclusively how the costs of construction contributed to communicative efficacy, while here I demonstrate how the fortress apparatus improved that communicative efficacy in an even more efficient manner, by capitalizing on of the affordances of the natural landscape.

As already discussed, the prominence of landmarks in the landscape is effected by several factors including the elevation, mass, color, and shape of the object being viewed, but also by factors relating to the viewer, including visual acuity, and by the relationship between viewer and the object, including distance and the presence of any intervening objects or surfaces in the landscape (Higuchi 1983; Ogburn 2006). Traditional viewsheds measure whether one point in the landscape is visible from another point, through basic line-of-sight determinations. Cumulative viewsheds, on the other hand, are the repetition of this process for multiple viewpoints and summing the results so that the value for any point in the landscape is how many viewpoints from which it is visible. "Total viewsheds" are an extension on this developed by (Llobera 2003; Llobera et al. 2010) that sums the viewsheds from every point in the landscape to every point in the landscape, to produce, "the cumulative viewshed of every possible viewpoint" (Conolly and Lake 2006:228).

Total viewsheds are exceptionally computationally expensive, and can take hours or even days to complete.[4] Rather than undertaking such processing heavy analyses, I attempted various sampling strategies wherein I effectively used very large cumulative viewsheds from either stratified or random samples of points to approximate the results of a total viewshed of the region at far lower computational cost. The first sampling strategy was the utilization of fishnet grids of viewpoints, at 1km (175 points) and 500m (700 points) spacing, and applied to both the 25m resolution ALOS DEM of the island (Figure 7.11) and the 5m regional DEM from the Department of Lands and Surveys[5]. A second iteration of this analysis used

[4] In 2010 (Llobera et al.), a total viewshed calculation for a 20km x 20km region with a 50m raster (so 400 x 400 pixels) required 34 days of computational time on a single processor, or 25 hours on a cluster of 43 workstations.
[5] The regional 5m DEM is missing data in the northeast corner, a 1.5km x 2 km area, because the DEM was produced from orthorectified aerial photographs from 1993,

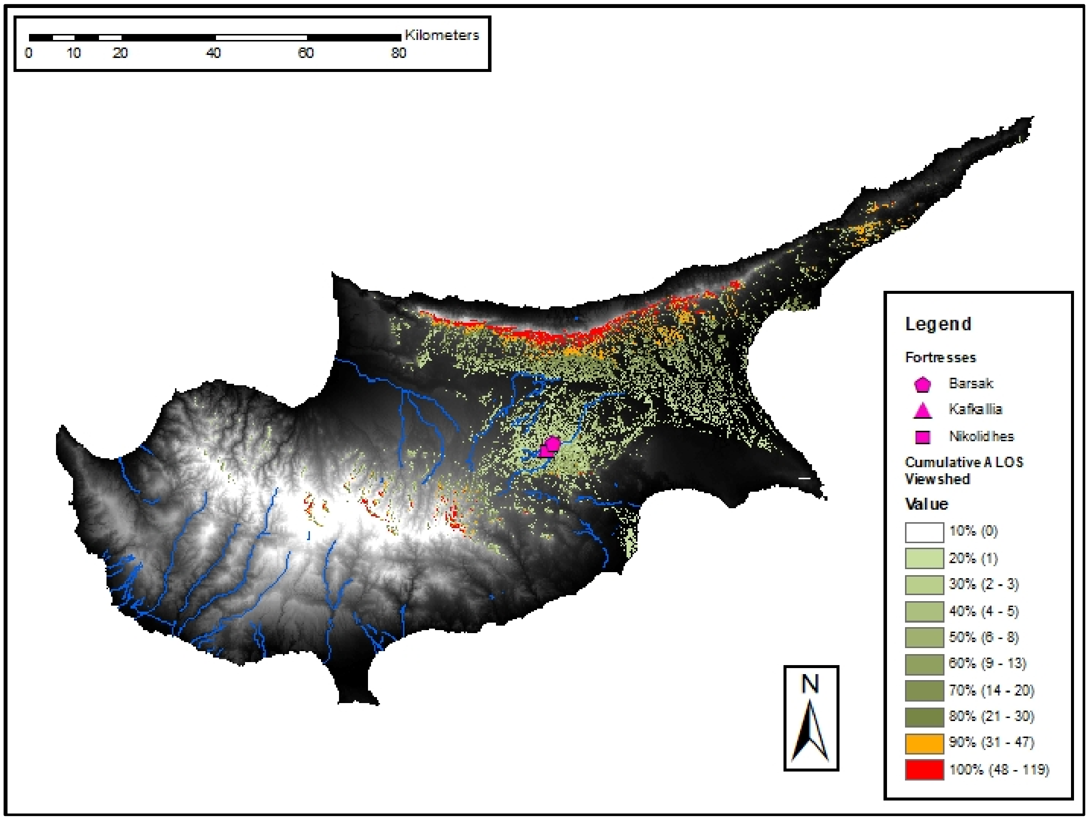


Figure 7.11 - *Cumulative viewshed using 175 points in a 1km fishnet over the Agios Sozomenos region and no limitations on visible distance. This model demonstrates the high visibility of the Troodos and Karpas, and the distances visible on a clear day.*

500m and 200m fishnets within a more localized 30 sq. km region, but using the =whole 187.5 sq.km region DEM, and giving each point a maximum viewing distance of 4 km[6] (Figure 7.12). The third strategy generated sets of 500 random points (with a minimum 100m distance between points) within the study region to

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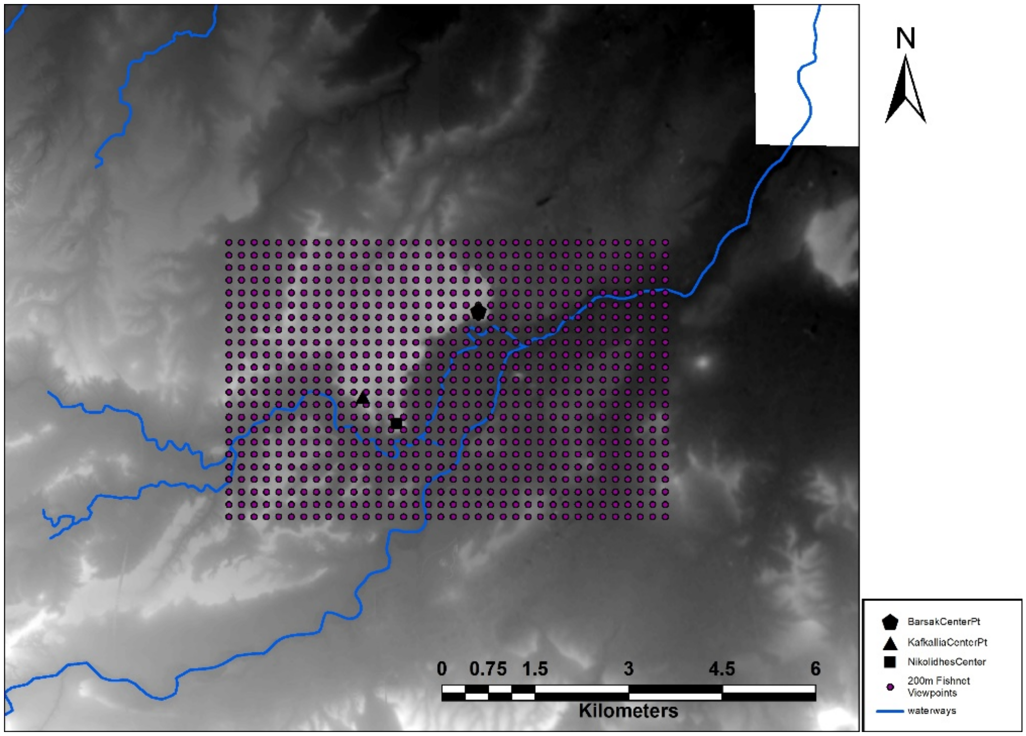
and that portion of the study region is within the occupied northern territory on the far side of the Buffer Zone.

[6] This strategy was adopted to account for the falloff in visibility that occurs near the edges of a Digital Elevation Model and to allow a more dense sampling strategy in closer proximity to the fortresses.



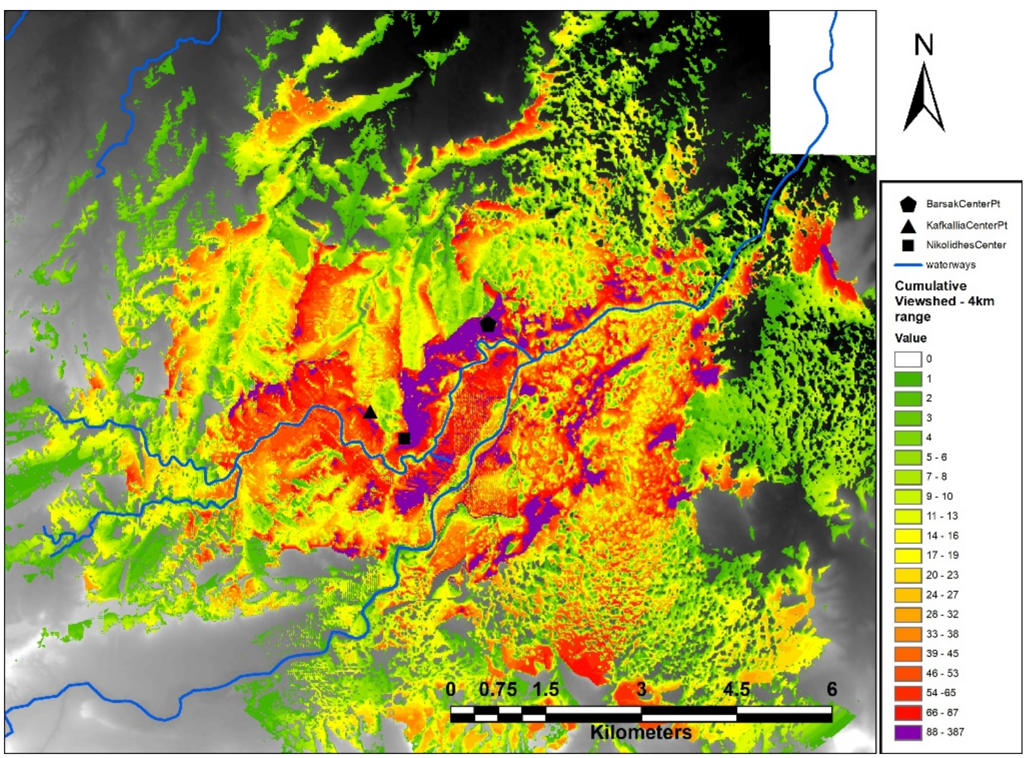
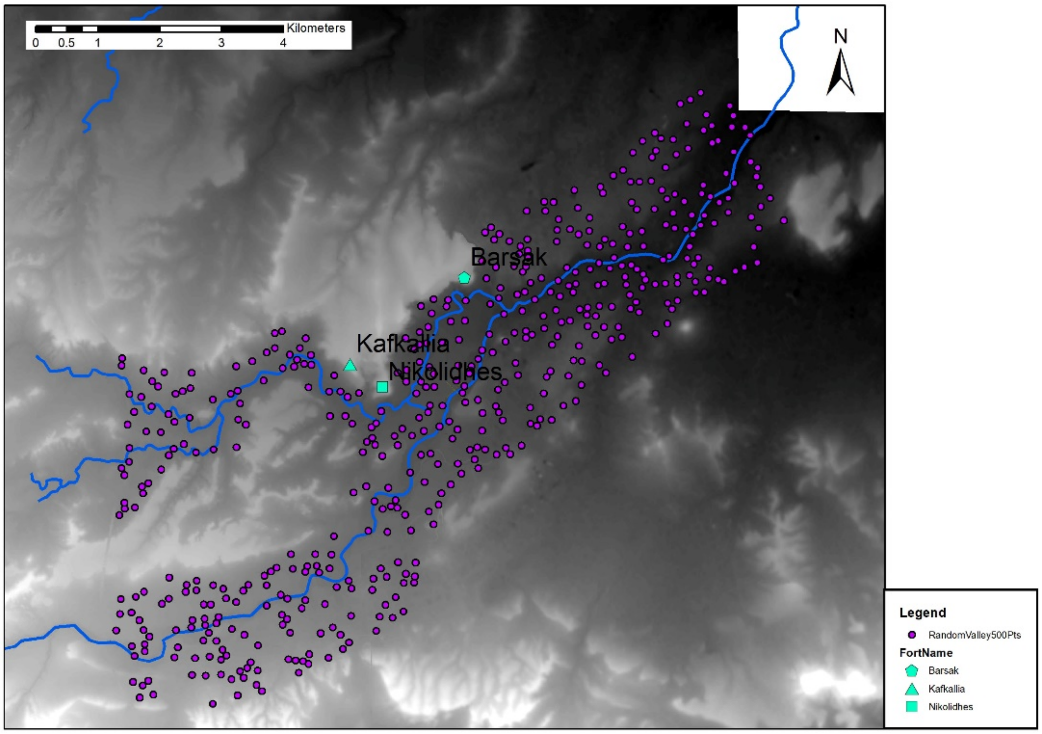


Figure 7.12 - *700 viewpoints in a fishnet covering the central 30 sq. km of the larger 187.5 sq. km. Agios Sozomenos Study Region (top), and the resulting Cumulative Viewshed, with the 20th quantile (top 5% most visible) highlighted in purple (bottom).*

similarly be used as viewpoints in a cumulative viewshed[7]. The fourth and final strategy attempts to take into account lived practice, as there are locations in the landscape where viewers are more or less likely to be found. Rather than points randomly placed across the entire landscape, I generated 500 observation points (again with a 100 m minimum distance between points) constrained to the river valley, using a methodology adapted from James I'Driscoll's (2017a) research on Irish hillforts. This constrained the viewpoints to locations where most daily human activity and movement would occur, and where communication routes through the region would pass (Figure 7.13). The results are a raster where each point in the landscape has a value of 0 (not visible to any viewpoint) or a value equal to the number of viewpoints from which it is potentially visible (theoretically as high as the total number of viewpoints). I then classified the results into quantiles, allowing the relative visibility of different locales to be observed.

In all variations of this analysis limited to the larger 187.5 sq. km region, the edge of the plateau where *Barsak* and *Nikolidhes* are located was in the top 10% of visibility, while in the more localized analyses where the viewpoints were constrained to the river valley or to the more local 30 sq. km region, *Barsak* and *Nikolidhes* were in the top 5% of visibility, and Kafkallia was in the top 10%. An unlimited cumulative viewshed calculation performed with the ALOS DEM of the

[7] An evenly spaced grid of points has better approximation properties than a random selection of the same number of points, but the error cannot be readily quantified. For a set of 500 random points, the confidence interval at 2σ= 0.044, or 4.4% .



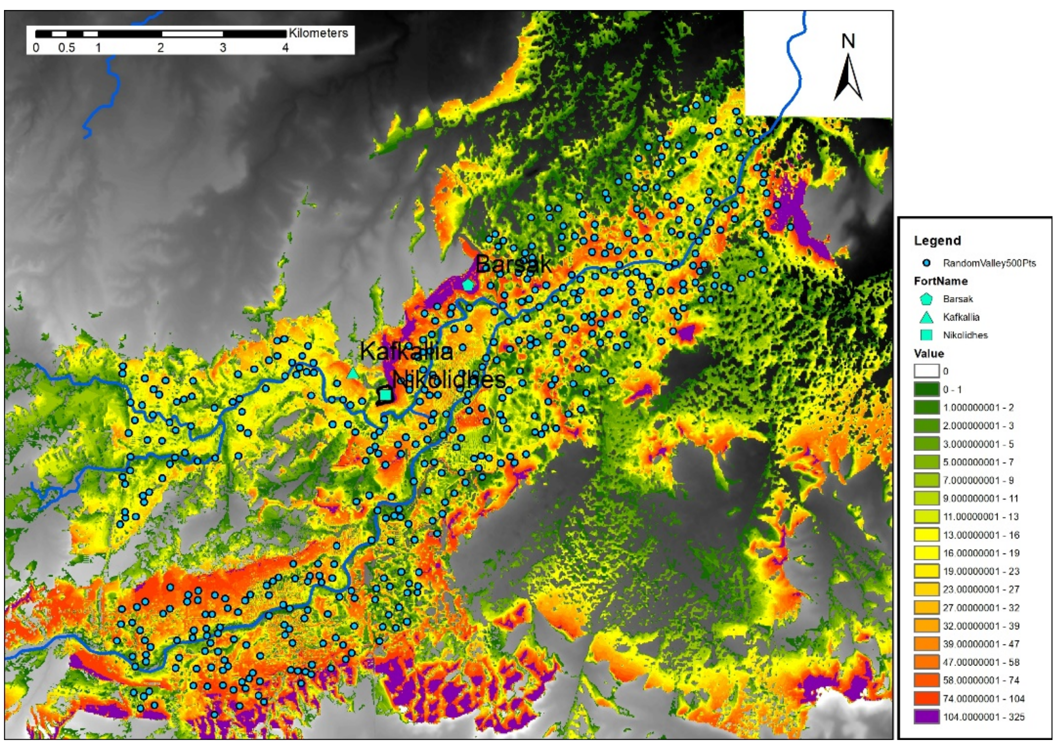


Figure 7.13 - 500 random viewpoints generated within the confines of the Alykos and Yalias River valleys in the Agios Sozomenos region (above), and the results of the Cumulative Viewshed with the 20th quantile (top 5% most visible) highlighted in purple (below).

whole island unsurprisingly determined that the spine of the Kyrenia mountains and the flanks of the Troodos Massif were the most visible regions of the landscape, demonstrating that like topographical prominence, visual prominence is also relative to the size of the locality being considered. The comparable results produced by all localized permutations both confirms the validity of these sampling strategies and indicates that the fortresses are both highly visible from their immediate (30 sq. km) region, and that they have a high visibility relative to the other landforms within a larger region (187.5 sq. km).

The significance of these changing capabilities for observation will be discussed further in reference to the application of disciplinary force, but this data demonstrates how the affordances of the topography of the plateau and the surrounding valleys and plain created the possibility for fortresses to be built that would command expansive views of the surrounding landscape, and in turn would potentially be viewable over great distances. Fisher (2014:360) has previously suggested that landscape prominence played a role in the siting of the Cypriot Bronze Age fortresses, particularly *Nitovikla*, stating that the locations were "probably as much to enhance their prominence on the ProBA Landscape as they were for defensive purposes." Certainly, as Lynch (1960, Ch. 3) has argued for prominent structures in cities, their visual and topographic prominence established the fortresses as landmarks, granting them far greater imageability and legibility than they would have had in less prominent locales. The landscape thus afforded the fortresses the capacity to transmit their messages of strength and community identity over greater distances and to more people, converting the monumental architecture into permanent symbolic reference points in the landscape (as described of Welsh hillforts by Driver 2013). The analyses of local topographic and visual prominence demonstrate that the enclosures at Agios Sozomenos took maximal use of these affordances within their local region, strategically positioning themselves to convey their defensive capability and their monumentality, and therefore also the power and strength of the community that built them and their claim on the use of the region and its resources. The choice of location in the landscape thus converted the enceinte of *Barsak* and *Nikolidhes* in particular into effective mechanisms of long-distance competitive display (see Sharples 2010; Brown 2009; Cunliffe 2006; O'Driscoll 2017b for similar discussions of Irish, British, and Welsh hillforts). This in turn granted them the capability to act efficaciously in the social realm by structuring human activity and behavior (Llobera 2001: 1007, following Lynch). The nature of the potential force they had is explored further in the discussion of the disciplinary landscape.

The Disciplinary Landscape: Segmentation and Control

When Foucault (1977) proposed the disciplinary techniques of the Art of Distributions and the Control of Activity (i.e. the Enclosure and Partitioning of Space, and the creation of Functional and Hierarchical Space), he was focused on the how architecture accomplished these effects, but features of the natural landscape are capable of similar affordances, which humans may then capitalize on or elaborate through the use and modification of the landscape. This use and modification of the landscape to enhance existing disciplinary effects or even generate new ones may be through the construction of specialized architecture, but also includes the choice of location for settlements, cemeteries, transportation routes, and areas used for ritual or production activities. Similarly, the disciplinary technique of surveillance that operates through defensive and monumental architecture may also be produced or enhanced by the landscape and the elaboration of its use by humans. This section therefore investigates the role the landscape, and its interactions with architecture and other human activity, plays in the generation of the techniques of discipline, and thus demonstrates how the landscape itself is an integral component of the disciplinary apparatus defined by the Cypriot fortresses.

Enclosure and Partitioning

The disciplinary techniques of enclosure and partitioning, by their very names appear to explicitly refer to the use of walls. Enclosure, as explored in Chapter 5, works to establish space that is different from other spaces, and then uses that space to concentrate and control human bodies and activity. While walls certainly produce these effects, but the landscape may as well. In the case of the Agios Sozomenos region, the plateaus in the north and west, and the ridge of hills to the south effectively enclose and define the basin of the Yalias and Alykos rivers' confluence as a distinct geographic area, separated from those on the other sides of the intervening landforms. Even to the east, where the now strengthened Yalias river flows across the Mesaoria largely unhindered to the Mediterranean coast, a highly prominent conical hill and another smaller plateau mark the eastern boundary of a well-defined territory (Figure 7.14). This basin, a natural topographical feature, working in concert with the defensive affordances of the fortresses, clearly served to concentrate human bodies and activity as settlements clustered and then expanded within its confines, presumably taking advantage of the rich agricultural land and its central location on the east-west and north-south transportation routes.

Figure 7.14 - *Looking east from Ambelia (left) and a view in the same direction from the northern wall of Barsak being enjoyed by the author's sister (right). The Yalias river is in the middle ground, its banks marked by verdant orchards. The conical hill to the right in each view is a major landmark.*

In the discussions of defensibility and monumentality in the landscape, I demonstrated how the location of the fortresses responded to the advantages presented by the topographical features of the plateau. This mutual production and reproduction of defense and landmark and the elaboration that occurred in successive iterations of fortress construction may also have conceptually partitioned the valley. Particular settlements, and the communities associated with them, became associated with one fortress or another by nature of their visual contacts and the access routes to the plateau. During the early phase of the earlier MC, many of the settlements in the valley were separated both physically and visually from each other by the body of the main plateau and other hills and ridges. During the MCIII, however, when two or possibly all three fortresses were in use, settlements clustered and expand out from the access routes to the plateau, forming a chain of sites all around the foot of the plateau with only short distances separating them. Despite their relative proximity, these settlements would still have been separated by their relationship to the plateau and the enclosures on top. Limited access means that different settlements would have to share routes to the plateau's crown. Glykia Vrysi and other settlements south or west of the plateau likely traveled to the plateau top by a route directly adjacent to the Glykia Vrysi steambed. Settlements east of the main body of the plateau, particularly Galatere and Kakoskalin likely took the narrow route up the cliff behind Agios Sozomenos, but Vathia Gonia and Bezinargos, and probably Ambelia as well, would have found the northern slopes of the plateau were their best route (Figure 7.15).

This changes again in the LC, when survey evidence indicates that *Galatere*, *Kakoskalin*, and possibly also *Vathia Gonia* and Potamia *Ambelin* were no longer used. This results in the concentration of valley's population and its division into two geographic centers- *Glykia Vrysi* in the south focused on the enclosure at *Nikolidhes*, and *Ambelia* in the north focused on *Barsak* (even though it appears to not remain in regular use). Three kilometers of land now separated the two settled

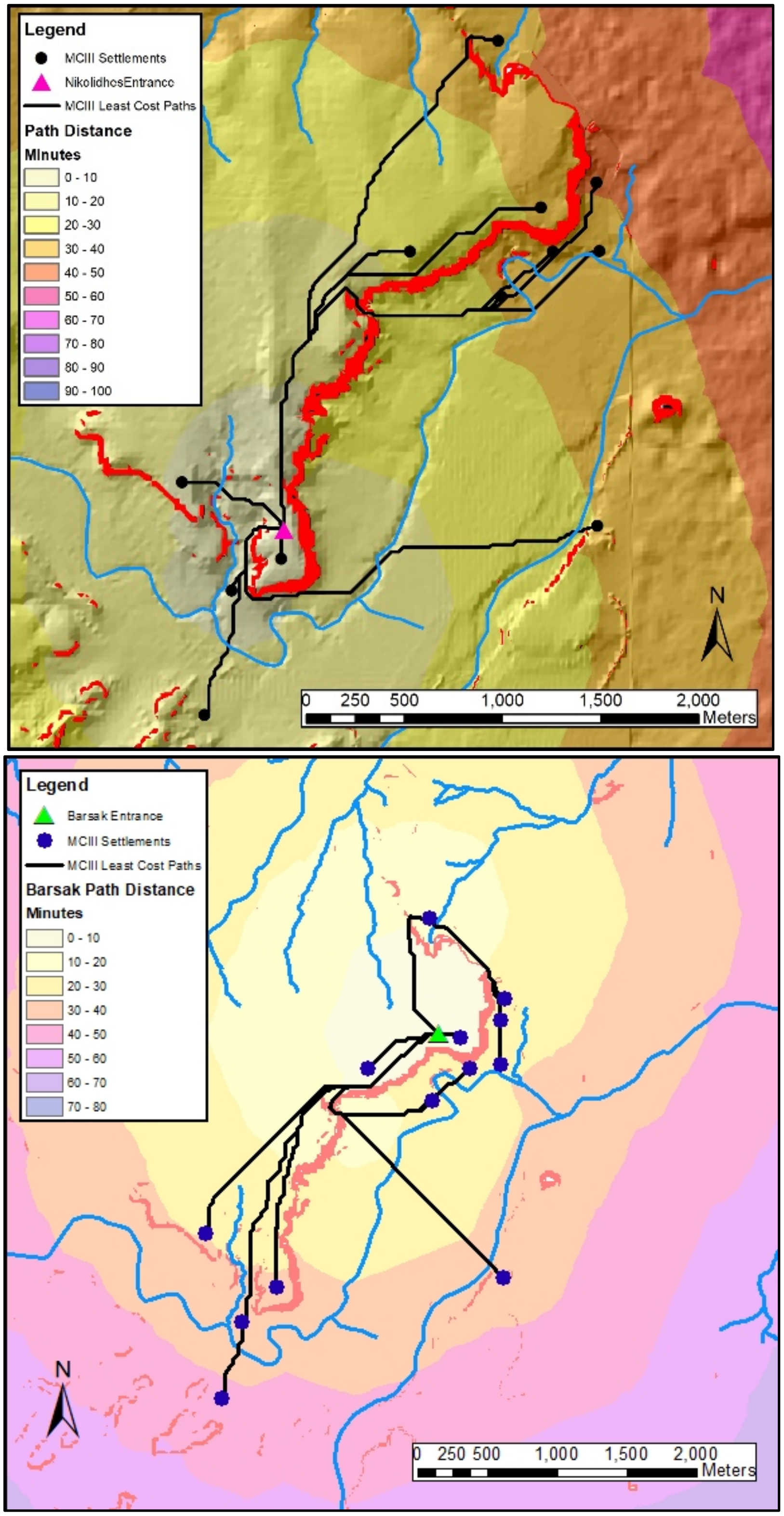


Figure 7.15 - *Least Cost Paths for Nikolidhes (top) and Barsak (bottom) in the MCIII. Occupation of Potamia Ambelin, the most southeasterly site, during this phase is unconfirmed*

areas, although people almost certainly would have regularly traveled between the two, and also used the intervening land for agricultural fields and grazing livestock. These two areas would also have been largely visually separated from each other by the mass of the Nikolidhes promontory, which blocks a direct visual connection between the bulk of the settlement at *Glykia Vrysi* and the eastward expansion of *Ambelia*, although the LC farmsteads at *Teratsies* and possibly *Muttaes* were likely visible.

Functional and Hierarchical Space

Similar to what was seen in the analysis of fortress architecture, the enclosure and partitioning of space in the landscape also gives rise to opportunities for differences to arise between these newly defined spaces. In fact, it is partially by these characteristic and relational differences that space becomes imbued with meaning, thus transforming undifferentiated space into place. Because the topography of the landscape and the distribution of resources within it are not uniform, differential access to places and to the affordances provided by other locations in the landscape are both potential sources of hierarchical and functional differentiation. Hierarchical ranking of space can also be seen in the marking of a place at having special significance, including the creation of landmark or monument, or by the differing levels of access and control over access to a place. Functional space in the landscape, as in architecture, can be identified by the presence of architecture or artifacts that provide evidence for specialized use.

First, the enclosure fortresses themselves, as demonstrated through the previous analyses of their elevation and their topographic and visual prominence, are physically elevated above much of the other human activity and occupation in the region and situated to be highly visible. This prominence, like that of the pre-Urartian fortresses of the ancient Caucasus, created a vertical hierarchy, with settlements below and fortresses both literally and metaphorically above. Smith (2003: 170) attributes the effects of elevation difference on both the perceived and experienced hierarchy of Caucasian fortresses to the practical relationship created between people by the vertical movements up and down the mountain slopes, an experience likely shared by the inhabitants of the Agios Sozomenos region when they traveled between the valley and the plateau. As summarized by Llobera (2001 : 1007), "The prominence felt at a location often provide[s] a way to address issues about hierarchy, rank and significance in a landscape. In a sense, it is connected to the symbolism associated with the vertical scale and the fact that prominent locations are related to visual and physical control [Higuchi 1989] which may contribute eventually to towards their symbolic significance. They are often used as landmarks and serve to anchor space around them [Lynch 1960]."

The location of the enclosures at high elevation, surrounded by steep slopes and rugged terrain also served to limit their relative accessibility. As already discussed this contributed significantly to the defensibility of the sites, but limited access also serves to divide the plateau from the valley, and the promontories on which Barsak and Nikolidhes are located from the body of the plateau. This defining of space by means of natural topographic features then provides particularly beneficial or efficient opportunities for access to these spaces to be further physically or visually controlled by means of architectural elaboration, such as the tower in the northeast corner of the Nikolidhes enclosure.

Access can also be limited by creating depth of space, similar to that seen in the access analyses of architectural space performed in the previous chapter. In architectural analysis, the relative depth of space is determined by the number of rooms or portals that one must pass through to reach a particular space. In the landscape, this relative "depth" may be produced by natural features that restrict or channel movement and by the presence of "gateway" settlements or defined activity areas that people had to pass through or by to reach another place. In the north of the Agios Sozomenos region, this role was played by *Vathia Gonia*, located so that any person taking the northern route onto the plateau from the valley would pass through or near the settlement. The analogous position in the southern part of the valley is *Glykia Vrysi*. The importance of this location in controlling access to the plateau is strongly indicated by the fact that the location of the blockhouse fortress at *Glykia Vrysi* lies directly on the route of the least cost path between the sites in the southern part of the valley and Nikolidhes. The presence of the blockhouse controls the route both visually and possibly physically, and in the process reinforced the importance of Nikolidhes, the access to which the blockhouse limited.

The third major access route to the plateau from the valley does not have a settlement or other architectural elaboration. Instead, the route from the top of the cliff path to Barsak passes a low ridge, located on which is the site of *Kokkines* (Figure 7.16). There is no evidence for architecture at *Kokkines*, and the site is mostly exposed bedrock. Four mortars or basins carved into that bedrock were recorded during survey, and there was a consistent thin scatter of late RP and RS/BS sherds and multiple pieces of groundstone, including grinders and a perforated weight. Although there is no evidence for occupation, per se, the bedrock modifications, ceramics and ground stone all suggest that this was a location of regular activity during the MCIII, despite the site not being located near any settlements. Instead, the site is located immediately adjacent to and about five meters above the path to Barsak that runs along the east edge of the plateau, situating it perfectly to operate

Figure 7.16- *Mari Yamasaki (PhD Candidate, Mainz) poses with a bedrock mortar and groundstone at the site of Kokkines during 2016 ASESP survey.*

as a waystation and lookout for that route. The evidence for increased activity also sets this location apart from the un- or less-differentiated space of the local landscape as a place, defined both by its functional use and by its local prominence, likely granting the ridge status as a landmark on the routes between settlement and enclosure.

While the preceding chapter explored the partitioning and specialization of space within the fortresses, the sites themselves also represent a new division and specialization of space within the wider physical and social landscape. During the preceding prehistoric Bronze Age (see Chapter 2), there is a growing concern with privacy and security materialized within the structure of settlements, associated with the beginnings of wealth and status differentiation, and the first specialized buildings are seen in the workshop facilities found at Erimi *Laonin tou Porakou* (Bombardieri 2010), Ambeliki *Aletri* (Webb and Frankel 2013), and Pyrgos *Mavrorachi* (Belgiorno 2004). The enclosures at *Barsak* and *Nikolidhes* elaborate on this pattern, as not just specialized buildings but entire sites that are set aside for functions beside settlement. The blockhouse at *Glykia Vrysi*, although located within a settlement, and the U-shaped enclosure at *Kafkallia* also set those settlements apart as different and possibly more important than other concurrently occupied settlements without such architectural elaboration.

Foucault understood the dividing and defining of space to be a procedure for the collection of knowledge and exertion of control. Places that were designated for special use, or to which access what limited, create further opportunities for control by dividing and assembling people into groups by their affiliation with or permission to use particular spaces. This, the continued differentiation of space into places where different activities occurred or where different levels of relative importance were attributed, worked in turn to produce and reproduce similar divisions within the communities that used the sites. Just as the fortresses assembled and articulated specialized functional spaces within their walls, they were also implicated in the division and definition of space in the landscape, spaces which then could acquire hierarchical significance or functional specialization through their use or by the nature of their location in the landscape relative to other sites and to natural or social resources, such as preferred farmland or trade routes.

I suggest that as the monumental enclosures served as billboards in the landscape, advertising the strength and security and that of the communities who built them, they attracted a new population within which new group identities emerged and asymmetrical relations arose, partially as the result of the division of space in the valley and differential access to social and natural resources. Although there is little that can be with any certainty said about these possible effects in the Agios Sozomenos region without more detailed data from excavation, but there are hints of these divisions to be seen in the existing excavation and survey data. First, of course, is the blockhouse structure at *Glykia Vrysi*, suggesting a special defensive and administrative significance for the settlement on the route to the Nikolidhes promontory, while the recent excavations by the Department of Antiquities at *Ambelia* uncovered architecture quite different in design from the blockhouse, with a

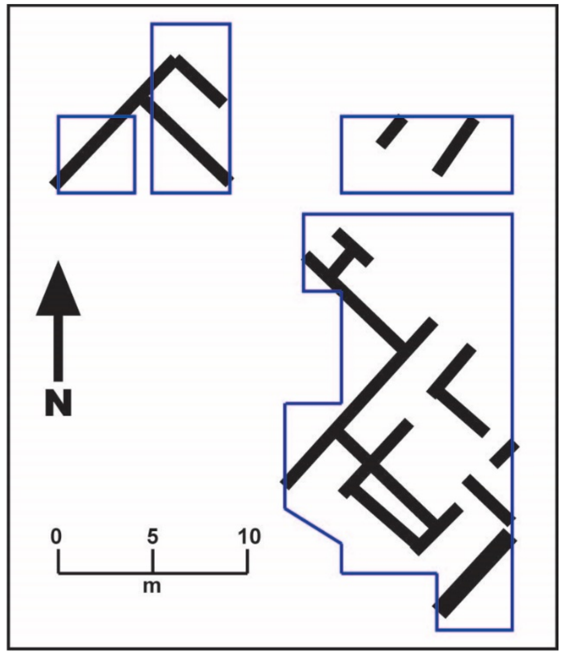


Figure 7.17 – *Schematic plan of structure excavated by the Department of Antiquities at Djirpoulos-Ampelia. Evidence indicates it had a second story, and plaster and pebble floors. (Based on plan in CDA 2016)*

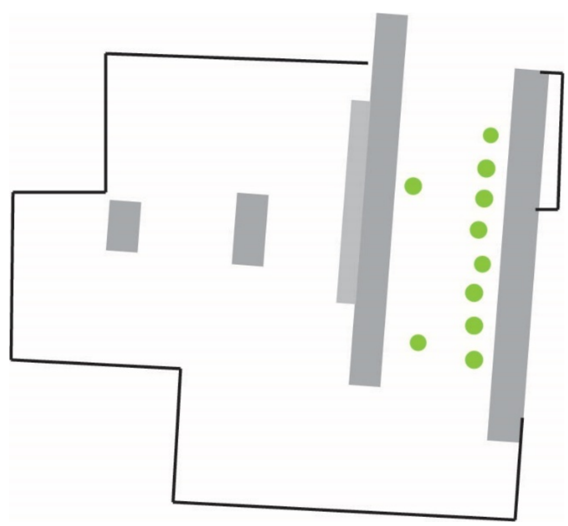


Figure 7.18 – *Schematic plan of LCI-II storage building (grey) at Ambelia West. Main room is 11.6 m x 3.3m, with stone pithos stands (green) on the floor. Additional wall stubs indicate possible presence of 2 additional parallel magazines. Black outlines the excavated area. (Based on aerial photograph in CDA 2017)*

höfhaus-type structure (Figure 7.17) and a specialized storage building (Figure 7.18). Survey at *Glykia Vrysi* recovered multiple pieces of slag and large groundstone, pointing to industrial and metallurgical activities. At Ambelia, large quantities of storage jars may indicate specialized storage of agricultural products including grain and olive oil, and while Ambelia does not sit on any route to the plateau, it does extend east along the confluence of the Yalias and Alykos rivers, placing it directly along any transportation routes following the rivers between the Troodos foothills and the Mesaoria.

Surveillance and Panopticism

The Foucaultian conceptualization of surveillance and its operation are linked closely with Jeremy Bentham's Panopticon, readily enabling the application of his theory of surveillance to architecture. The panopticon as Bentham conceived it, however, requires the separation and immobilization of those observed by means of walls, or in other words the materialization of the disciplinary techniques of enclosure and partitioning. Outside this idealized architectural form, in the real world boundaries are more permeable and the objects of observation are frequently mobile, and therefore cannot be perfectly isolated. Bart Simon has argued that there is nothing about the panoptic mode of power that requires its expression in architecture and fixed spatial arrangements, and that Foucault understood panopticism is itself to be mobile and, "able to produce the effects of enclosures wherever people might be found." The condition of human mobility is one of relative enclosure, rather than presence/absence. Material boundaries and limits are to be found even in places associated with high mobility, including highways and in airplanes, and these limits are further augmented by cultural discourses that inform acceptable behavior. Bart Simon, reviewing Foucault's conceptualization observed that "All that panopticism arguably requires of us is segmentation and differentiation, the marking of our passage from one spatial and cultural zone to the next" (2005:10). Landscape and architecture working together as components of an apparatus segment and differentiate, generating a potential for disciplinary force that can be instrumentalized for a number of purposes.

This broader understanding of the conditions under which the techniques of surveillance and panopticism may function also enables us to see their operation in the natural landscape of the Agios Sozomenos region. The previous section identified ways that topography and patterns of settlement and movement contributed to the segmentation and differentiation of space and people in the landscape. It then remains to investigate how the assemblage of the fortresses and the landscape produced opportunities for surveillance, and to consider whether these capacities became the continuous, visible, and unverifiable surveillance of the disciplinary apparatus, reproducing itself and the self-subjectification of the objects in its gaze.

I say the gaze of the fortress, because this is the true operation of surveillance and panopticism, where the observer cannot be observed, and is therefore unverifiable. Only the possibility of observation that is necessary for the operation of discipline, so the human observer becomes unnecessary, with the walls that screen the presence or absence of the human observer taking the observer's place. Similarly, for the fortresses to communicate strength and defensiveness, few or no actual defenders would need be present either. This symbolic surveillance of the landscape was thus highly effective and efficient, but only in certain applications. The collection of knowledge is also an important application of surveillance. However, this type of surveillance, be it to provide social or economic benefit (e.g., "Knowledge is power") or for defensive purposes by providing advanced warning of attack or knowledge of the movement of potential threats, does require human participants for the operation of the apparatus. The necessity of human observers for what was likely considered the central function and organizing purpose of the sites would thus serve to create an expectation of observation, thus ensuring the continuous operation of the disciplinary apparatus even when human observers were not present or their attention was elsewhere.

Some aspects of visibility in the landscape were presented previously as part of the discussion of prominence and monumentality. Topographical prominence contributes to visual prominence, making certain locations in the landscape more visible than others, and this was seen to be true of the locations of the Agios Sozomenos enclosures, especially *Barsak* and *Nikolidhes*. When considering monumentality of the sites, the question was whether the inhabitants of the various settlements would be able to see the walls of the enclosures, but the inverse of these relationships may also be assumed to be true, meaning that if the walls of the enclosures were visible from the settlements, then the settlements were visible from those walls. The topographic locations that granted the enclosures a high level of visual prominence therefore would be expected to also provide the fortresses with expansive individual viewsheds.

Having determined that the fortresses were highly visible, it is now necessary to consider where they would actually have been visible from, which also reveals where in the landscape the occupants of the fortresses would have been able to observe. These considerations are also important for assessing the defensive affordances that the viewsheds of the enclosures would provide. This can be determined through more simple viewshed analyses, using a limited number of representative points around the fortress enclosures as viewpoints. Assessing the visibility of the enclosures and of the landscape from the fortresses, however, requires consideration of the limitations of human visibility. Higuchi defined three ranges of distance in the landscape that produced qualitatively effect visibility. In the short range, individual objects and details can be seen, while in the middle range objects blend into each other, so that individual trees become a forest. At the long range, only major topographic features such as mountains can be discerned. These measures have been adapted for use in landscape archaeology previously by Ogburn (2006) who adapted Higuchi's ranges for use in GIS applications. He defined the distance at which an object was within short range as 57 times the smallest dimension of the object, and the middle-range as 1150 times, though long range could extend further than 3400 times.

Figure 7.19 - *A flock of sheep in the center of this image, located approximately 1 km east of the photographer on top of Nikolidhes, demonstrates the difficult of identifying small figures in the landscape.*

For my calculations the height of an observer atop the fortress walls was assumed to be 5m, and knowing that visual acuity drops off rapidly after the middle range, the viewshed calculations were limited to a 2.5km range (approximately 2m x 1150). It should also be noted that these measurements primarily assess the visibility of architecture and other large objects in the landscape. Humans and animals would be more difficult to see at a distance, and although their movement would them more visible than a static object, identifying specific individuals at a distance greater than a kilometer would be unlikely (Figure 7.19).

The 2.5km viewsheds were calculated for each of the three enclosures, utilizing multiple viewpoints around their perimeters to capture the full directional range, and these were compared to the locations of settlements from the different phases (examples in Figure 7.20). Shared viewsheds, which consider how much of the landscape multiple viewpoints can see in concert, were also prepared for every combination of fortresses (examples Figure 7.21).

The results of the 5km viewshed calculations demonstrate how the topographic prominence of the fortress locations effects visual affordances. Kafkallia's viewshed is the smallest, constrained by plateaus to the west and the Nikolidhes promontory to the east, although it still has the greatest view of the enclosures up the Alykos River valley to the west. Notably, Kafkallia cannot see or be seen by most of the wide plain of the Yalias River where settlement activity in later phases is concentrated. Barsak has the greatest view to the north and east, and unobstructed views to the extent of its range in the south. It would certainly have been the first structure able to see travelers approaching from across the Mesaoria plain or up the Yalias River drainage, and its viewshed includes much, but not all, of the MCIII settlement pattern. The higher elevation of the plateau behind the site and the rest of the plateau to the south occlude all of its views to the west. Nikolidhes, possibly the last built and almost certainly the last occupied of the enclosures, also has the largest individual viewshed, approximately 270 degrees. This viewshed also encompasses all of the known LC occupations in the valley, except Vathia Gonia north of Barsak, whose LC occupation is uncertain.

The shared viewsheds reveal some interesting patterns in the development of fortress visibility in the valley over time, especially when compared with the results

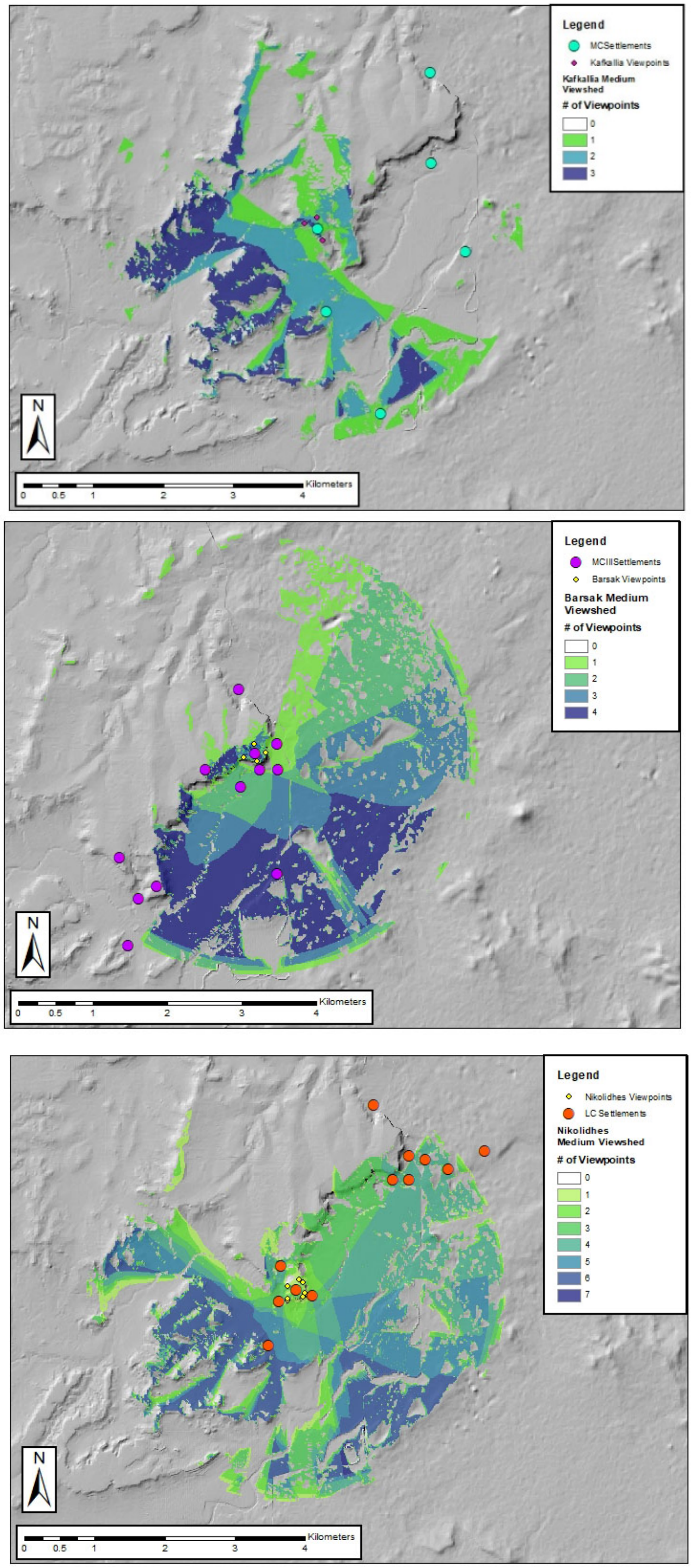
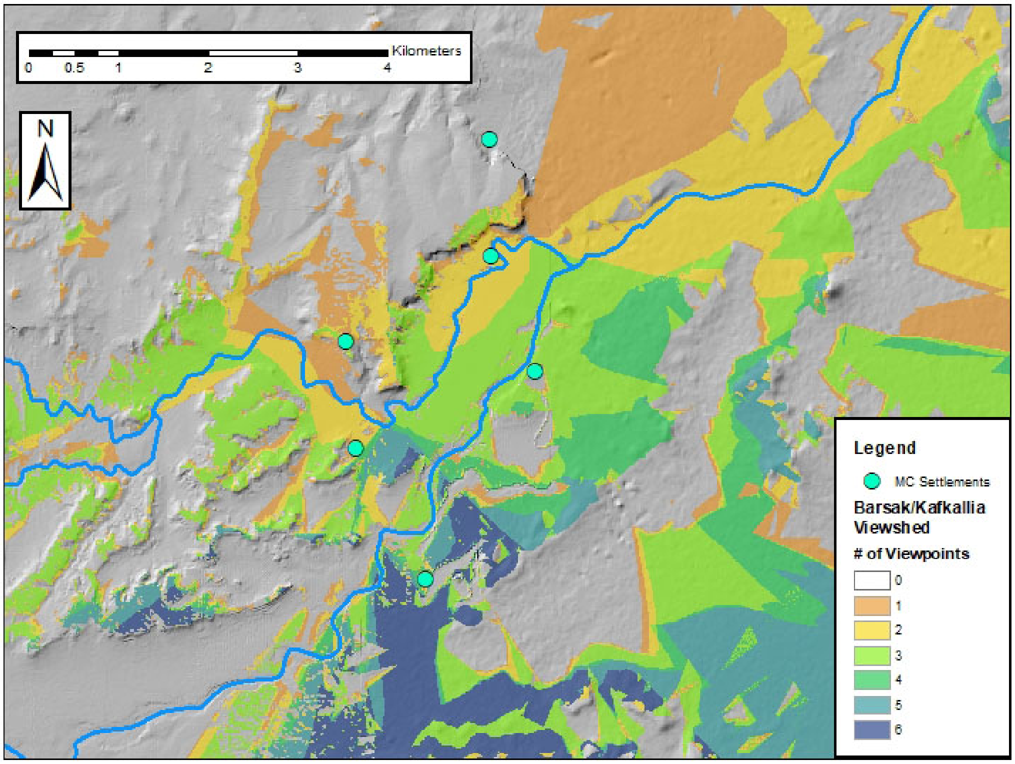


Figure 7.20 – *2.5 km viewsheds for Kafkallia compared to MC Settlement locations (top), Barsak compared to MCIII settlement locations (middle) and Nikolidhes compared to LC settlement locations (bottom)*



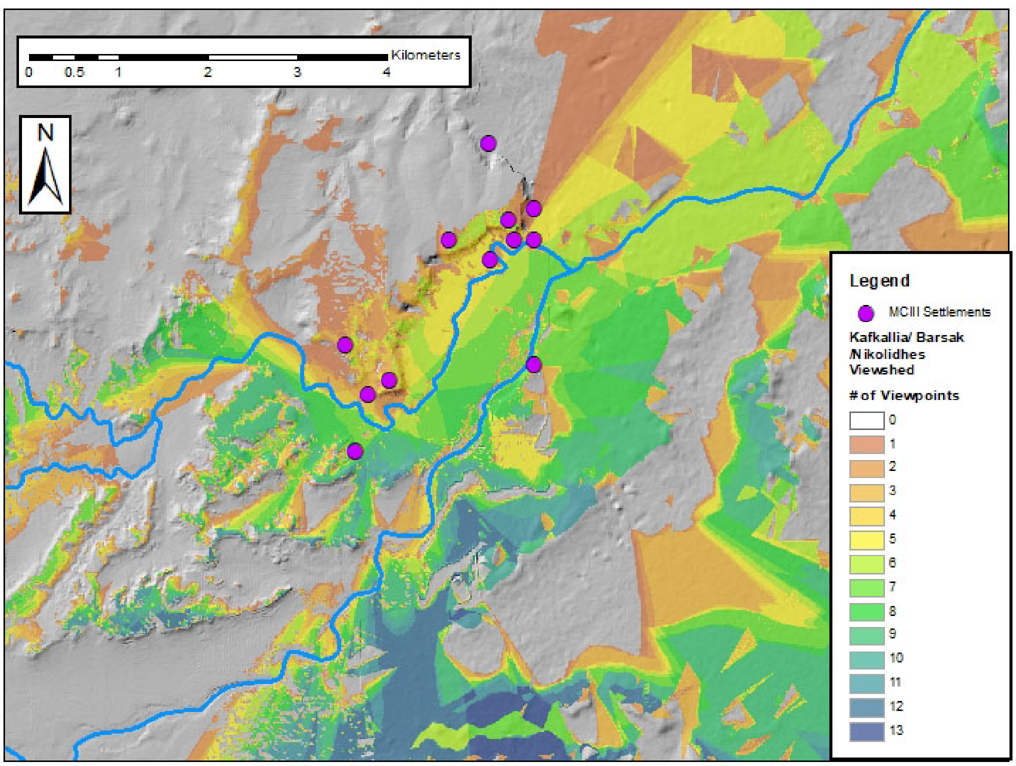


Figure 7.21 - *Shared viewshed of Barsak and Kafkallia with MC settlements marked (top) and the shared viewshed of all three enclosures with MCIII settlement marked (bottom)*

of the individual viewshed calculations. First, comparing the shared viewshed of *Barsak* and *Kafkallia* with that for all three fortresses (Figure 7.21), it can be seen that the addition of Nikolidhes to the shared viewshed does not significantly enhance the visual affordances of *Barsak* and *Kafkallia*. However, the individual viewsheds reveal what can also be quickly discerned during a personal visit to the plateau, which is that *Barsak* and *Kafkallia* cannot see each other. If some form of visual communication were developed, perhaps mirrors or flags, to allow messages to be sent between sites, *Kafkallia* and *Barsak* would be unable to avail themselves of this system without a relay point, which incidentally, the tower in the northwest corner at Nikolidhes was perfectly situated to serve as. The affordances of the landscape granted the enclosures great capacity for long-distance observation and communication, but the shape of the plateau placed limitations on this capacity that had to be accounted for. The construction of Nikolidhes, and working together could now command the full extent of the valley. As already observed though, Nikolidhes had the largest individual observation range of any of the enclosures, lacking only the furthest extent of Kafkallia's western view, and Barsak's greater angle of view to the northeast, so it I possible that Nikolidhes' construction also made the other fortresses obsolete, leading to their apparent abandonment well before Nikolidhes went out of use.

Discussion

Discipline is about the control of human behavior, and through the constant reproduction and elaboration of the techniques by which the human body is objectified and its movement constrained, compliance may be attained. The compliant human objects of discipline thus become subjects, political actors who self-enforcing the behavioral norms established in them through the operation of the disciplinary apparatus. This transition from object to subject is achieved through the simultaneous operation of many disciplinary techniques, including those related to the temporal regulation of activity. These techniques are less accessible to archaeological study, although Luca Bombardieri[8] has proposed that the creation of specialized workshops during the Middle Bronze Age as workplaces that are spatially distinct and separated physically from domestic units represents the innovative division of the day in to temporal categories of "work" and "not work," and thus perhaps the first step in the alienation of man from his/her labour. However, the disciplinary technique that most compels compliance and self-discipline is also the technique that most clearly operates through and is enhanced by the affordances of the landscape – namely, surveillance.

David Lyon (1994) in *The Electronic Eye: The Rise of Surveillance Society,* a highly influential work in the burgeoning field of surveillance studies, identified what he called the two faces or the "Janus-faces" of surveillance, observing that people

[8] Public lecture at the University of Cyprus Archaeological Research Unit, "Work wearies. Labour practices and ideology of work at the Middle Bronze Age Erimi Laonin tou Porakou", October 10th, 2016.

voluntarily subject themselves to surveillance because surveillance offers palpable benefits, particularly in the realm of defense, in spite of the negative experience of repression and control. This model of the dual-efficacy of surveillance fits the pattern of the defensive affordances of visibility seen in the fortified landscape, which also possesses the capability to monitor and police the behavior and activities of the local populace. This concept is further extrapolated by Davis in *Ecology of Fear* (1998) who proposed that the future city of 2019 would be divided physically and technologically into defensive and surveillance zones. The actual effectiveness of visible surveillance apparatus as deterrence or protection is not certain, but visible surveillance in the form of manned gates and security cameras in the post-modern city is emblematic that security concerns are being addressed and thus enhances the attractiveness and commercial value of developments possessing such elaborations. In these geographies, surveillance-based security is highly symbolic (Fussey and Coaffee 2012:204), but the symbolic nature of the security does not necessarily mean that the surveillance apparatus is entirely incapable of operating effectively as a defensive apparatus, merely that its effectiveness is less important than the appearance of such.

The high security financial districts and gated communities of 21st century Western cities envisioned by Davis find early counterparts in the segmentation and surveillance of people, structures, and settlements in the Agios Sozomenos region in mid-2nd millennium BCE Cyprus. However, in the Bronze Age the symbolic efficacy of the surveillance apparatus was almost certainly determined by the efficacy of the fortresses as a defensive apparatus, or at least at the time of their initial construction. I suggest that this also goes some way towards explaining the construction of multiple monumental fortresses in the Agios Sozomenos region over such a relatively short span of time and in such close proximity. The symbolic protection offered by the monumental walls atop the cliffs made the river valley an attractive location to settle in, as seen in the rapid growth of the settlements, and in turn the inhabitants would voluntarily subject themselves to the omnipresent potential for their own observation posed by the same structures. Their willing participation in the operation of the disciplinary landscape included their participation in the reproduction of the very apparatus that objectified them, building additional enclosures in more prominent, and thus more efficient, locations, and elaborating on their architecture to enhance their capabilities. Through this process of production, reproduction, and elaboration of the disciplinary apparatus the local population were transformed into compliant subjects. All that was needed for a social and political hierarchy to arise was for an individual or group to recognize and utilize the opportunities that the operation of the apparatus presented. The archaeological evidence does not make it clear how early this occurred: probably between the construction of *Barsak* and *Nikolidhes*, as *Barsak* evinces strategic elaboration and reproduction of the fortress apparatus, but still maintains an egalitarian ethos in its use of space, though of course this could have been an intentional tactic on the part of emergent elites who did not wish to alienate the newly forming lower classes by overstepping their own incipient authority. However, in the construction of the ashlar-faced tower at *Nikolidhes*, we may confidently identify the unequal power dynamics of a hierarchically stratified society operating through the architecture and landscape that had set the conditions for and enabled that society's development.

Chapter 8

CONCLUSIONS

Utilizing a case study of the fortresses and landscape of the Agios Sozomenos region of Cyprus during the Bronze Age, I addressed three nested research concerns in this dissertation:

1) What forces or mechanisms transformed Cypriot society during the MC-LC transition?
2) What role does warfare and the introduction of defensive architecture to the landscape play in the restructuring of social organization?
3) How can we theorize the interaction of materials, landscapes, and people in processes of sociopolitical production?

The fortresses and settlements of the Agios Sozomenos region are only one case study within the social and political landscape of Cyprus during the Middle to Late Bronze Age transition, but they provide a window onto some of the dynamics of the transformation that Cypriot society was undergoing. There were clearly multiple forces acting on Cypriot society at this juncture, all of which fed into the unique trajectory of rapid intensification and the complexity of social relations. Although internecine violence was undoubtedly a symptom of, or a response to, these other forces, violence and warfare were not epiphenomena, but were forces with real, lasting effects of their own.

One way that the impact of violence on a society can be traced is by investigating the effects of violence on the material assemblage of the society, including their singular landscapes, and in turn how the resulting assemblage might affect social relations. By taking the efficacy of the material world in social life as my starting point, I have demonstrated how the fortresses of Bronze Age Cyprus were key components in an apparatus that generated three different, but interrelated modes of power: defense, monumentality, and discipline. The operation of these forces within society produces and reinforces social differences and inequalities, which define political relations. Thus, by tracing the operation of these forces in the production of a disciplinary landscape, I present one mechanism by which the large-scale transformation of Cypriot society occurred, and more broadly a lens through which we may understand how the landscape and architecture of violence affect our social lives.

A Violent Context

Chapters 3 and 4 of this dissertation laid out the argument for the development of internecine conflict, or warfare, on Cyprus through the Prehistoric Bronze Age. Although the presence of prehistoric violence has frequently been downplayed on Cyprus, as elsewhere, using the frameworks of the "Dimensions of War" (Solometo 2006) and the "Correlates of War" (Wileman 2009) as guides, I traced the evidence for warfare on Cyprus and the dynamics of its practice.

Throughout the Early Cypriot Bronze Age and into the Middle Cypriot Bronze Age, the archaeological record of Cyprus exhibits only a few of the correlates of war. Several of those are causal correlates, meaning they establish the conditions under which conflict may be expected to develop. These include demographic growth, differential access to resources, changes in trade connections and patterns, and changes in subsistence patterns and technology. There are, however, correlates of war that are more indicative of the practice of interpersonal violence, including increased numbers of weapons, and evidence for weapon damage and skeletal trauma. I demonstrated that these weapons were intended for use against humans, not just for hunting or as symbols of wealth. Organized internecine conflict is harder to establish, although increases in the presence of weapons, especially those suited to interpersonal conflict, suggest the development of a revered warrior identity within the society, and some evidence for settlement destruction and the possible adoption of more defensible settlement strategies hint at conflicts based on group identity. However, the small social scale and social proximity that characterize Cypriot society at this time would serve to limit the severity of the conflict.

As the MC progresses, it is clear that the frequency and intensity of internecine violence increases as social scale and social distance grows, weakening social ties between groups. The occurrence of weaponry continues to increase in some regions, sometimes as part of a mortuary assemblage including shafthole axes, metal belts, and possible equid remains, similar to those associated with contemporary "warrior burials" in Syria-Palestine. Maces, associated with royal power in Near Eastern iconography, are also an important weapon on Cyprus during this period, but rather than couching these developments in terms of mere emulation, I argue that the choices of what material practices were emulated must be understood within the context of warfare and a shared warrior ethos. Based on recent excavation evidence and synthetic analyses of survey data, there is also an appreciable increase in settlement destruction and abandonment as the MC draws to a close, accompanied by new site foundations in different regions of the island. This pattern is matched by a growing body of evidence for contemporaneous experiments in the fortification of settlements, seen at sites like Erimi *Laonin tou Porakou* and Agios Sozomenos *Kafkallia*, in addition to the construction of new, specialized fortresses. Together they demonstrate a growing societal conception of territoriality and concern with defensive positioning.

Each individual category of evidence for warfare is ambiguous on its own, but combined they paint a picture of growing unrest that culminates in a sustained and harmful conflict. The evidence presently available for the earlier phases of the Bronze Age, particularly that for the development of a culture of "warrior elites," suggests that Cypriot internecine conflict began as localized, episodic aggression, probably in the form of infrequent or small-scale raids. The target of these raids would be prestige goods, such as metal (especially weapons), women, and livestock, and death in combat, especially of non-combatants, would be minimized. However, by the end of the Middle Bronze Age, likely driven by greater social scale and social distance caused by population growth and increased competition driven by differential resource access, evidence suggests that casualties and resource and property destruction increase. The increased frequency, predictability, and severity of combat in turn drove groups to adopt high-cost defensive strategies, in the form of large-scale population movements and the construction of fortifications. I would also suggest that this pattern may also be explained by the development during this period of a cultural logic of social substitution, a social calculus in which the identity of the individual and the group are equated or conflated (Parkinson and Duffy 2007). This logic, in turn, contributed to the development of social segmentation and notions of territoriality, as the landscape becomes associated with diverse group identities.

Fortresses and Social Transformation

The social context of turmoil and violence in which the Cypriot Bronze Age fortifications were built is important to understanding the how and why of their construction, and so they must first be understood as components of a defensive apparatus. The defensive apparatus was itself a source of political force, reshaping social relationships in the landscape. However, the continuing operation of this apparatus and the processes of functional overdetermination and strategic elaboration that occurred within it went on to generate new modes of political power through innovative techniques of monumentality and discipline. Chapters 6 and 7 detailed how the affordances of the material assemblage of walls, towers, ditches, cliffs, paths, water, settlements and other components interacted to produce different modes of power that operate within the fortress apparatus.

First, I demonstrated that Cypriot Bronze Age fortresses, and particularly those in the Agios Sozomenos case study, were components of highly effective defensive apparatuses produced by the interactions of fortress architecture and features of the Cypriot landscape. The great variety in defensive strategies evinced in these assemblages, and the variability between structures, point to both a lack of central authority directing their construction and to processes of experimentation and learning in their production. Within the Agios Sozomenos case study alone, there is great variation in the form of the fortresses, and while they take advantage of the affordances of the landscape in similar ways, they also adapt to the specifics of their particular location in the landscape and emphasize the use of different defensive techniques. I argue that Kafkallia, which appears to have been the earliest fortification built, also has the most ad hoc approach to the design of its defenses, which adopt a principle of minimum effort to defend a settlement that was already occupied. *Barsak* and *Nikolidhes*, in contrast, appear to serve populations living outside their enclosures, primarily in the valley below. The exact sequence of their construction is uncertain, but both make more efficient use of the natural defensive affordances of the local terrain, including increased surveillance and limited access routes, while *Barsak* arguably has the greatest elaboration in defensive architectural features, with its impressive double-wall-and-ditch.

Monumentality is the second modality of social power that I argue the Cypriot fortress apparatus produced. These structures were arguably the first truly "monumental" architecture on Cyprus, in multiple senses of the word. The first sense is simply scale, and I demonstrated that these constructions were many multiples in size of contemporaneous and preceding buildings. The second sense, which correlates to the first, is the amount of labor invested in their production. The time and effort invested in the construction of these structures required large groups of people to work together for extended periods of months or even years, and required sophisticated cooperation and organization as well as the kind of long-term interaction through which group identities are forged and strengthened. Emergent elites also benefited, as they could afford themselves of opportunities to assume positions of leadership in construction, maintenance, or operation of the structure. The fortifications then remained in the landscape as a monument, in a third sense of monumentality, as a colossal *aide-mémoire* to those experiences and identities, empowering the structures to visually communicate the strength, resources, and coordination of the group both to its members and to outsiders. Leaders within the group would likewise benefit from these messages, helping them to advance and secure their positions in society, and thus driving the development of social stratification and hierarchical relations.

I have argued that this ability to forge identities and communicate may not have been intentional in the earlier or smaller fortresses, where what monumentality was produced may easily have been the inadvertent byproduct of choices that were made for defensive purposes, although the lack of intent would not reduce their efficacy. But in other choices, for example the defensively unnecessary walls above the cliffs at *Barsak* and *Nikolidhes*, or the artificial mound at *Vounari,* it is possible to see the monumental efficacy of the structure being intentionally enhanced. Placement of these and other structures took advantage of the natural affordances of the landscape, specifically elevation and prominence, to increase the efficacy of the communicative capabilities of the architecture.

The final mode of power that I argue operates through the Cypriot fortresses is discipline, in which supervision and control of movement and activity generates docility and transforms the individual into a self-regulating subject. The direct control of movement and activity is most clearly expressed in the architecture of the fortresses, where techniques that define and divide space were developed and elaborated on. These technologies often also enhanced the defensive efficacy of the structures, so like their monumentality, their disciplinary effect may at times also have been unintentional, but in its refinement we may see the influence of an emergent ruling class. Self-regulation, the key to political subjectivity, is produced through constant surveillance, a technology that Cypriot fortifications capitalized on in both their defensive and monumental modes of operation. This technology supervised activity within the fortresses, but most importantly it also operated outside the fortress walls, creating a disciplinary landscape in which nearly all settlement, movement, and daily activity in the Agios Sozomenos region was performed under the gaze of the apparatus, as I demonstrated through an analyses of viewsheds and least cost paths. Combined with the communicative techniques of monumentality, this gaze produced a field of power in which individual identities as subjects and members of the community were produced, while the identity of the community as a whole was defined and tied to the landscape through the experience and perception of space. In this manner, the disciplinary landscape was active in the reification of hierarchical social relations and in reinforcing notions of territory.

The techniques of discipline, especially surveillance and those encompassed by the art of distributions, are generated by the same components of the fortress apparatus that produce its defensive and monumental efficacy, so it is difficult to identify at what point the disciplinary efficacy of the apparatus ceases to be the unforeseen effects of functional overdetermination and strategic elaboration, and becomes the intentional generation of disciplinary power used to reify an existing hierarchical political structure. However, the disciplinary force of the apparatus undoubtedly increases over time, with the construction of additional fortress sites and the elaboration of existing fortifications, most clearly seen in the later construction of the ashlar-faced tower at *Nikolidhes* and the increasing control over labor and movement by the blockhouses at *Glykia Vrysi* and *Enkomi*.

The development of major early LC centers in the regions where fortress clusters are located supports the importance of the role of the fortress apparatus and the disciplinary landscape it produced in the restructuring and development of complex political relationships within Cypriot society. The data from the Agios Sozomenos region suggests a clear progression of extension and increased efficiency in the operation of disciplinary techniques from the earliest *ad hoc* phases of fortification at Kafkallia, through the complex fortifications at *Barsak* and *Glykia Vrysi*, up to the elaboration of *Nikolidhes*. This model of development, however, remains reliant on a very insecure chronological sequence for the construction episodes of the sites. The brevity of the MCIII/LCI period makes it unlikely that the three large enclosures were purely sequential, with no overlap between their use, but the order of their construction and abandonment remains uncertain, as is also true for the settlements in the valley below. One strength of Foucault's apparatus conceptualization is the understanding that the development of the apparatus over time need not be driven by over-arching human strategies, but is itself often the result of *ad hoc* responses to current needs and the affordances of the apparatus' current configuration. Were the construction and use of the components of the fortress apparatus in Agios Sozomenos to have occurred in an entirely different order, less strategic forethought could be attested to the builders, but the process of experimentation, response, and modification, would still have resulted in much of the defensive, monumental, and disciplinary power that comes to operate on the local population. The large-scale model of population and political consolidation would remain unchanged, although the process of development would be slightly less elegant.

Political Transformation on Cyprus

In previous studies of fortresses and prehistoric warfare, fortresses have been associated with the development of cyclical or continuous warfare, as conquest becomes impossible and no one group is able to achieve dominance. This produces a Balkanized landscape that actually hinders political consolidation and centralization (Arkush 2011:10). What has received less attention, however, is what happens in a society when fortification is only a relatively brief strategy, and it is not universally adopted. In the Agios Sozomenos case study, the social power generated by the operation of the fortress apparatus enabled group stability and growth, and undoubtedly provided political opportunities for aggrandizing elites to capitalize on the strategic elaboration of the emergent defensive and disciplinary apparatus. However, these processes of group consolidation and increasing political complexity were not distributed across the Cypriot landscape evenly. Our present knowledge of the distribution of fortresses (see Figure 5.1) and settlements (Georgiou 2007), suggests distinct regional clusters where these processes were at work.

The central region is the most obvious, with clear spatial and visual connections between the fortress clusters at Agios Sozomenos, Geri, Aglantzia, and the Kyrenia Pass. With its very small enclosures, Geri may have been an *entrepot* between the larger clusters at Agios Sozomenos and Aglantzia. All these sites mostly likely had some relationship to what must have been a major MCIII/LCI settlement at the location of the modern capital city of Nicosia, as evinced by the rich mortuary discoveries at *Agia Paraskevi*. Excavation at these other Mesaoria sites and detailed comparisons, including chemical studies, of material from the Agios Sozomenos region and *Agia Paraskevi* could reveal much about these relationships.

It is unfortunate that more is not known about the settlement at Kalopsidha or the earlier phases of occupation at Enkomi, but the presence of large MCIII or LCI walls at both sites, and the blockhouse at Enkomi, indicate that this area was a likely locus of incipient disciplinary power on the east coast, with possibly connections to the sites on the Karpas Peninsula. Likewise, the fortresses on the Kormakiti plateau were possibly related to the emergent center at *Toumba tou Skourou* on Morphou Bay in the west. Indeed, the clustering of fortresses, their diverse forms, and their relationships with the landscape does not suggest an apparatus for copper extraction focused on one site such as Enkomi (Monahan and Spigelman 2019; contra Peltenburg 1996), and I would argue suggests instead the emergence of three separate, possibly competing polities. The rapid acceleration of Cyprus' political complexity through the LC, culminating in the establishment of Alashiya as a member of the "Club of Great Powers" by the 13th century BCE, might then be more productively understood through the lenses of peer polity interaction (Cherry 1986) and "negotiated peripherality" (Kardulias 1999), as has been argued for as a model of secondary-state formation in the Minoan and Mycenaean palatial systems (Parkinson and Galaty 2007).

Whether one polity achieves ascendance during this later phase of development is a separate question, but the distribution of fortifications and settlements during the MCIII/LCI does not support a model of Enkomi controlling the Mesaoria and the northeastern Troodos copper sources at this early juncture. In fact, Agios Sozomenos and *Toumba tou Skourou* both had far superior access to the copper sources, and the chain of fortresses between Agios Sozomenos and the Kyrenia Pass could potentially have protected a trade route between those sources and international trade connections through the north coast. Notably however, the large and metal-rich cemeteries at Bellapais *Vounous* went out of use right at this time. Perhaps this wealthy community relocated from the coast, where they were more vulnerable to attack from the sea, to the safety of the Mesaoria behind fortresses defending the pass through the Kyrenia Mountains. Alternatively, endogenous communities in the Mesaoria could have used the Kyrenia pass to cut the north coast off from the copper supply on which they were reliant, and instead established trading relationships with settlements on the east coast and the Karpas Peninsula, such as *Nitovikla*, *Vounari*, and *Kalopsidha* (and later Enkomi), but this all remains conjecture without further data.

Final Thoughts

This dissertation developed and applied the model of the apparatus and the disciplinary landscape as a way to understand the processes of sociopolitical production generated by the interaction of people, materials, and landscape. The fortress is an exemplary disciplinary apparatus, generating multiple power modalities, and operating extensively through the components of a broader landscape. The power of surveillance to extend disciplinary power over great distances is key to understanding the operation of disciplinary apparatuses, but its relationship with the modalities of defense and monumentality strengthens discipline, by tying the subjectification of the individual to notions of group identity and reliance on that identity for both real and psychological security. The opportunities for such a powerful confluence of forces to be coopted by political regimes, whether ancient or modern, are obvious and examples abound of defensive structures that capitalize on their monumental capacities and exert disciplinary force through the wider landscape. The disciplinary landscape, as the field in and through which these forces operate, therefore holds great potential as an analytic for how architecture and landscape assemble multiple modes and technologies of power into a far-reaching political web in which humans become entangled.

Appendix A:
GAZETTEER OF BRONZE AGE SITES IN THE AGIOS SOZOMENOS REGION

This gazetteer does not provide significantly more information than was previously available from the work of Hector Catling (1962) and the Cyprus Survey, Giorgos Georgiou (2007), and Andrea Rowe (1995), but it seeks to clarify several points of confusion regarding toponyms and site identifications, while presenting the current status and conditions of the sites. Full analysis of the survey results will be submitted to the Department of Antiquities archives and the CAARI Library. Sites are listed alphabetically by toponym under the name of the village land to which they properly belong. Cyprus Survey numbers, and numbers from previous site catalogs are included whenever possible. A brief discussion of the *Ampelia* site complex is included under the description of *Ampelia* (east). A map providing the locations (known or suspected) of the sites follows.

Agios Sozomenos

1) *Ampelia* (east)

   CS 374

   HWC MC No. 23, LC No. 38; GG No. 181; AR No. 21

   Alternative Name: *Ambelia*

   MCIII/LCI, LC; Cemetery/Settlement

Located during extensive survey. Surveyed intensively with *Kamini (Ampelia)* (107 units collected).

Material collected: 706 sherds; 167 pithos fragments; 22 groundstone; 1 chipped stone; 1 slag.

This large site is part of one large complex encompassing *Dzirpoulos (Ampelia)*, *Ampelia* (east) and (west), and *Kamini (Ampelia),* creating a site of more than 10 ha. It is also possible that the locales of *Bezinargos* to the north, *Kakoskalin* to the southwest, and *Kafkalla tis Dhrakontias* to the east, are part of the same complex, extending over close to 20 ha. Even *Galatere* may be considered part of this mega-site, as the oxbow bend in the Alykos that presently divides *Kakoskalin* and *Galatere* reveals extensive architectural remains along its length, suggesting that the shifting course of the river could have destroyed much of the intervening settlement. The northern portion of *Ampelia* (east) is a limestone ridge that contained a large cemetery, now largely destroyed by military and agricultural activity. Extending south of this cemetery, to the end of the plateau overlooking the Yalias River, is a settlement that includes the site of *Kamini (Ampelia)*. The division between cemetery and settlement is unclear.

2) *Ampelia* (west)

CS 372; 373

HWC MC No. 21, 22; LC No. 37, 39; GG No. 181; AR Nos. 19, 20

MCIII/LCI, LC; Storehouse, Settlement, Cemetery;

Located during extensive survey. Intensive survey completed (108 units collected), with 100% collection over the area of the storehouse (169 units collected).

Material collected: Site = 444 sherds, 201 pithos fragments, 11 groundstone, 9 chipped stone. Storehouse = 1092 sherds, 1095 pithos fragments (223.5 kg), 26 groundstone, 12 chipped stone, 1 slag.

This portion of *Ampelia* lies east of a stream that separates it from the location of the ASESP excavations at *Dzirpoulos*, and west of a road that separates it from *Ampelia* (east) and *Kamini*. *Ampelia* (west) has extensive and at times dense ceramic scatter, including large quantities of pithos sherds. The northern hillock had visible architecture, including walls and plaster floors, which were excavated by ASESP in 2018 to reveal a large storehouse. Tomb openings are visible in 1963 aerial photographs of the southern hillock above the Alykos River. Rowe (1995) has the locations of CS 372 and 374 (her Nos. 19 and 21 respectively) reversed in her maps and descriptions.

3) Barsak

CS 410

HWC EC No. 20, MC No. 26; GG No. 183; AR No. 14

MCIII/LCI; Fortress.

Located during extensive survey. Military trenches surveyed (14 units collected). Excavated in 2015 and 2016.

Material collected: 257 sherds from survey. 188 sherds, 1 spindle whorl, from 2015 excavations.

The inner enclosure wall is visible on the surface for most of its path. Very little cultural material is visible on the surface. Investigations and results are detailed in Chapter 5.

4) *Bezinargos - see* also *Dzirpoulos* (cemetery)

Catling 1953

MC, MCIII/LCI; Settlement/cemetery?

Alternative Name: *Dzirpoulos*?

Not located during extensive survey. Likely destroyed.

This site only appears in Catling's earliest research and reports to the Cyprus Museum. The description of its location and the ceramics collected suggest that this site could be the same as the *Dzirpoulos* cemetery that Catling would later report in the Cyprus Survey (site no. 696), but in 1953 he reported it as a settlement. This locale is inaccessible and highly disturbed by the construction of a large water treatment facility.

5) *Dzirpoulos (Ampelia)*

CS 2754

GG 181; AR 25

Alternative Names: *Djirpoulos*, *Tzirpoulos, Vizajaro*

MCIII/LCI, LC; Settlement

Excavated by ASESP since 2012.

Also called just *Dzirpoulos*, this site is here referred to as *Dzirpoulos* (*Ampelia*) to distinguish it from the cemetery of the same name and to highlight its relationship as part of the larger *Ampelia* site complex. The cemetery of the same name (site no. 7 in this gazetteer), thought to be located ~400m to the north, was likely associated with the settlement. Catling also recorded a site in this general location during his 1953 research, but he called it *Vizajaro*. Excavations by the Department of Antiquities uncovered a substantial multi-story building with courtyard at this location, and casual survey and architecture visible in the river cut indicate the presence of more structures in the vicinity. More intensive survey is not possible at this time because the fields to the north and west of the current excavation area are not available for research.

6) *Dzirpoulos (*cemetery)

CS 696

HWC MC No. 27; GG No. 190; AR No. 18

Alternative Name: *Bezinargos*(?)

MC, MCIII-LCI; Cemetery

Not located during extensive survey. Likely destroyed.

The Cyprus Survey recorded a small looted cemetery at this location, where it would likely be associated with the settlement at *Ampelia*. This location is no longer accessible because of the water treatment facility, which may also have destroyed what remained of the site. This site is not the same as the settlement at *Dzirpoulos (Ampelia)*, where ASESP has excavated for several years, though they are likely related. This site was included in GIS analyses as the hypothesized northern extent of the *Ampelia* complex.

7) *Galatere*

    CS 455

    HWC MC No. 28; GG No. 185; AR 24

    Alternative Name: *Kakoskalin* (incorrect)

    MC, MCIII-LCI Settlement.

    Located during extensive survey. Intensive survey completed (84 units collected).

    Material collected: 1031 sherds, 35 pithos fragments, 9 ground stone, 5 chipped stone, 1 quadruped figurine fragment, 1 piece of iron, 1 yellow ochre.

This large site extends from beneath the modern village of Agios Sozomenos, north towards *Kakoskalin*, and contains material from across the Bronze Age, and many later periods, including medieval. The Bronze Age component is most visible in the northern half of the site, and architecture, mostly likely MC or early LC, is visible in multiple places in the river cut. This locale was incorrectly called *Kakoskalin* by Rowe and later by the French survey project run by Devillers (et al. 2004; 2008).

Devillers et al. (2004) report recovering LC pottery 3-4 meters down within a mechanically excavated trench produced for geomorphological research. ASESP recovered stratified MC pottery from the river bank at a depth of 2 meters. The material collected at this site by the 2016 ASESP survey was labeled incorrectly as "*Kakoskalin.*"

8) *Glykia Vrysi*

   CS 414

   HWC MC No. 25, LC No. 40; GG No. 184; AR Nos. 3, 4, 5

   Alternative Name: *Nikolidhes* (Gjerstad 1926); *Glyka Vrysis*

   MCIII/LCI, LC; Large Settlement, Blockhouse Fortress

   Located during extensive Survey. Intensive survey completed (144 units collected).

   Materials collected: 1073 sherds, 375 pithos fragments, 24 groundstone, 13 chipped stone, 5 slag.

The location of the blockhouse fortress is discussed in detail in Chapter 5. The fields where the settlement is located, on both sides of the Glykia Vrysi tributary north of the Alykos, are covered with a high density scatter of ceramics, primarily PW and other LC wares, and large quantities of ground stone, primarily grinders. 4 pieces of slag were recovered during intensive survey, and one particularly large piece (~250g) was collected as a chance find in 2015 and submitted with the 2015 ASESP excavation collections. A massive saddle quern is located in a field boundary (under which is most likely the western wall of Gjerstad's fortress) east of the stream bed. The site is bounded to the east by a rifle range, to the south by the Alykos River, and to the north by modern artificial terraces built with the tailings from the Nikolidhes sand mine. It is likely that the site used to continue north under these terraces.

9) *Kafkalla tis Dhrakontias*

CS 692

HWC LC No. 46

LC; Storehouse/Small settlement?

Not located during extensive survey. Inaccessible within the Green Zone. Catling collected PW pithos fragments on this site, located on a low plateau east of *Kamini (Ampelia)* and north of the Yalias river.

10) *Kakoskalin* – see also *Galatere*

GG No. 185, AR No. 24?

MCIII/LCI; Settlement

Located during extensive survey. No intensive survey, due to terrain. This toponym properly describes an area of deeply eroded gullies, directly south of the Barsak promontory, that feed into the Alykos River immediately shortly before the confluence with the Yalias Rivier. Located between *Galatere* and *Dzirpoulos (Ampelia)*, well-built Bronze Age architecture can be seen in several places eroding out of the gullies at *Kakoskalin*, and there is a high density pottery scatter throughout. Ceramics collected were primarily RS/BS. This area, however, is used as a motocross track, and the highly uneven terrain makes systematic survey extremely difficult. Material collected by the 2016 ASESP survey at this locale was labeled "*Djirpouolos-Motocross*." The site and toponym has been conflated with *Galatere*, which is properly located 200 meters southwest across an ox-bow bend in the Alykos river, and Rowe applies the toponym incorrectly to the fields north of *Dzirpoulos*.

11) *Kamini (Ampelia)*

CS 693

HWC LC No. 47; AR No. 22

Alternative Names: *Kamine*, *Kamine-Ambelia*

LC; Settlement, Storehouse

Located during extensive survey. Surveyed intensively along with *Ampelia* (east).

This site is part of the *Ampelia* site complex, and was first recorded by Catling in 1953 as *Kamine Ambelia*. The site is located on top of the same low plateau as the eastern *Ampelia* cemetery, north of the present-day confluence of the Alykos and Yalias rivers. The Cyprus Survey reported large quantities of pithoi fragments, and collected PW pithos here, and the ASESP survey similarly recovered large quantities of pithos, plain wares, and ground stone, suggesting a settlement and/or a large storage and processing facility.

12) Kokkines

CS 411

HWC MC No. 29, LC No. 45; GG No. 186; AR No. 13

MCIII/LCI, LC; Activity Area, Small Settlement?

Located during extensive survey. Insufficient material for intensive survey. The site of *Kokkines* is located on the end of a low hill atop the Agios Sozomenos plateau. It looks out over the main route that follows the cliffs, and the likely route between *Barsak* and the settlement in the valley, via the narrow path behind the modern village of Agios Sozomenos. No building material was seen at the site, although the bedrock was worked to produce a couple mortars. Surface material consisted of rubbers, RP and PW.

13) Laxia tis Lourismenou

CS 412

AR No.15

MCIII/LCI?; Activity Area?

Not located during extensive survey. Probably ephemeral.

Andrea Rowe was also unable to locate this site, or the similarly named *Laxia tis Skalas*. This area is now destroyed by the activities of a large mining operation. This site was not included in analyses, because identification, location, and dating were unreliable.

14) *Laxia tis Skalas*

CS 413

HWC MC No. 30; GG No. 187; AR No. 12

MCIII/LCI?; Activity area?

Not located during extensive survey. Probably ephemeral.

Like *Laxia tis Lourismenou*, this site could not be located by Andrea Rowe in 1994 or by ASESP. It is possible that Catling located a small activity area. This site was not included in analyses because identification, location, and dating were unreliable.

15) *Mouttes* (settlement)

CS 419

GG No. 188; AR 11

MCIII/LCI, LC?; Small Settlement/Farmstead?

Alternative Name: *Muttaes*

Possibly located during extensive survey.

A small scatter of LC ceramics were found near the locale of this site in the Spring of 2017. No collections were made, although LC pithos and PW were noted. The Cyprus Survey and Rowe (1995) also both record RPIV and LC PW. The scatter is thin, on top of the cliffs above the cemetery of the same name. This site was not included in analyses because identification and location were unreliable, and the small settlement at *Nikolidhes* (no. 18 in this catalog) effectively serves as a proxy for both.

16) *Mouttes* (cemetery)

CS 425

HWC MC No. 31, LC No. 44; GG No. 188; AR No.12

Alternative Name: *Muttaes*

Located during extensive survey. Surveyed intensively (24 Units collected). Although this site was relocated, recovery during intensive survey was low, and material collected was primarily medieval, explained by the proximity of this site to the known medieval site(s) at CS 424 and 426. Catling recorded 3 tombs and recovered RPIV. Excluded from GIS analyses because no evidence of settlement.

17) *Nikolidhes* (fortress)

CS 418

HWC MC No. 32; LC No. 40; GG No. 189; AR No. 10

MCIII/LCI, LC; Fortress

Located during extensive survey. Insufficient surface material for intensive survey. Excavated 2015, 2017-2019.

The circuit wall at *Nikolidhes* is clearly visible on the surface for much of its path. The plateau is extremely deflated, with very little topsoil remaining. What does remain is trapped behind the circuit wall, providing an opportunity for the ongoing excavations. Investigations and results are discussed in more detail in Chapter 5. Little internal architecture is visible on the surface. Similarly, little cultural material remains on the surface, and little has been recovered from excavation, as detailed in Pilides 2017a and Pilides 2018a.

18) *Nikolidhes* (settlement)

CS 420

HWC LC No. 43; GG No. 189; AR No. 9

MCIII/LCI?, LC; Small Settlement/Farmstead

Not Located. Destroyed.

Some confusion surrounds the *Kafkallia*, *Nikolidhes*, and *Glykia Vrysi* toponyms. This site was recorded by Catling as a small farmstead, calling it *Nikolidhes*. Andrea Rowe recorded a site at this same location, but she mistakenly believed it to be a new site, which she recorded as a farmstead at *Kafkallia*. Given the proximity of the locales of *Kafkallia* and *Nikolidhes*, the confusion is not unwarranted, but properly *Nikolidhes* should be east of the stream of Glykia Vrysi, and *Kafkallia* to the west. Both Catling and Rowe recovered LC pithos, while Rowe also recoded PW and RP IV. This locale has now been completely destroyed by the operations of a large open-pit sand mine. This site is included in analyses, and as it is very close to the settlement at *Mouttes*, serves as a proxy for both. Catling's LC date is kept, although the RPIV reported by Rowe may indicate an MCIII foundation.

19) *Nikolidhes* (cemetery)

CS 415

HWC EC No. 19, MC No. 24, LC No. 41; GG No. 189; AR No. 6

MC, MCIII/LCI, LC; Cemetery

Alternative Name: *Kafkallia*

Located during extensive survey.

According to Catling (1962) and the Cyprus Survey records, the cemetery at *Nikolidhes* is ~500m west of the fortress, on a low hill west of the stream at Glykia Vrysi, and southeast of *Kafkallia*. Overbeck and Swiny recorded the "necropolis" at this exact location during their explorations of the *Kafkallia* fortress, and they used the *Kafkallia* toponym. Arguably, because this site is located west of Glykia Vrysi the *Kafkallia* toponym is correct, but the *Nikolidhes* toponym is kept here because a Cyprus Survey number has been assigned to it under this name and to distinguish it from the *Kafkallia* cemetery that was located 300m to the northwest. See further discussion under No. 25 of this gazetteer. Several open tombs with multiple chambers are still visible at this location, although several more were destroyed by the recent plowing of a new road. Sherd scatter is dense. No collections were made, but MC and LC wares were seen, as previously recorded by Catling, Overbeck and Swiny, and Rowe. A large (~20 cm high, 8 cm dia.) RPIII jar neck with ornate relief and incised decoration was found by a local shepherd and submitted with the ASESP 2016 survey collections. The site is not included in GIS analyses because it is not a settlement.

20) Teratsies

MCIII/LC; Small Settlement/Farmstead.

Alternative Name: *Glykia Vrysi*

New site located during extensive survey. Surveyed intensively (28 units collected).

Material collected: 34 PW, 14 RS/BS, 2 WS, 1 RP, 2 Coarse, 4 Cookpot, 70 Late or Unidentifiable; 1 limestone basin.

Teratsies appears to be a single structure, at least 10 m long and a few meters wide. The site was uncovered, and destroyed, by heavy mechanical terracing activity. Portions of wall were visible, as were pottery and a large stone basin, broken into pieces. It is likely that this site was mistaken by Andrea Rowe for the fortress at *Glykia Vrysi* (CS 414), but the location and orientation does not match Gjerstad's (1926) description of the site. The actual ceramic scatter was very small, only ~ .5 ha, and discontinuous with the settlement at *Glykia Vrysi*.

21) Vathia Gonia

CS 697

HWC MC No. 33, LC No. 48; GG No. 182; AR No. 17

MC?, MCIII/LCI, LC; Settlement

Not located during extensive survey. Destroyed.

This site is now located north of a modern water treatment facility, directly north and below *Barsak*. There was previously a spring in this location, and the Cyprus

Survey collected RPIII, RPIV, RP Coarse, WS, BR, PW and PWW, indicating likely occupation through the MC and into the LC.

Dhali

22) *Agios Demetrianos*

CS 662

HWC MC No. 38; GG No. 202

MC; Cemetery/Settlement?

Not located during extensive survey.

Myres and Ohnefalsch-Richter reported a cemetery here in 1899, which Catling later recorded as a settlement because of the presence of groundstone along with WP ware. The site could not be relocated, but Rowe reported visible architecture.

23) *Dhrakontospilios*

CS 421

HWC MC No. 39; GG No. 203; AR Nos. 1 or 2

MC, MCIII/LCI?; Cemetery, Settlement?

Possibly located during extensive survey.

The status of this site remains unclear. The large cave/tomb at the locality of *Dhrakontospilios* (dragon't cave) is NW from the fortified settlement at *Kafkallia,* clearly visible in the vertical cliff face. Very few sherds were found near this locale, and those were directly below the inhabited plateau of *Kafkallia* and the cave-tombs, that were re-inhabited during the Early Modern period and used as animal pens. Andrea Rowe's Site no. 1 has this toponym, but she locates it a kilometer to the NW. Adding to the confusion, she also records having found a site (her No. 2) in the locale properly associated with this toponym, but she calls it "*Kafkallia* (b)." Dairy operations in this area have expanded significantly since 1995, so it is possible that a small settlement at this location has been destroyed. Two tombs were excavated by the Department of Antiquities at this locale, 1943/1 and 1944/II-14/1. These collections were not located. In 1948, a particularly fine ivory macehead (1948/VIII-11/1) was turned in to the Department, reportedly found in this vicinity (though also possibly coming from the cemetery at *Nikolidhes*). This site was not included in analyses, because it is most likely a cemetery.

24) *Kafkallia* (fortress)

CS 416

HWC EC No. 27, MC No. 40; GG No. 204; AR No. 8

MC, MCIII/LCI; Fortified Settlement

Located during survey. Intensively surveyed (15 Tranches, 22 Buildings).

Material Recovered: 393 Sherds; 5 Pithos fragments (all RP); 18 Groundstone; 13 Chipped Stone.

This site is a listed monument and fenced. The survey at *Kafkallia* is described in more detail in Chapter 5. The plateau is severely deflated, with much exposed bedrock. However, there is sufficient soil deposition in places, particularly within visible building outlines, such that future excavation could prove fruitful. Material collected appears to be primarily RPIII/IV, but due to exposure much of the material is too abraded to be identified.

25) *Kafkallia* (cemetery)

CS 417

HWC EC No. 26; GG No. 204; AR No. 7

MC; Cemetery.

Not located during extensive survey. Destroyed.

This site is part of the confusion surrounding the cluster of sites at *Kafkallia*, *Nikolidhes*, and *Glykia Vrysi*. According to Catling (1962) and the Cyprus Survey records, the *Kafkallia* cemetery was located north of the fortified settlement at Kafkallia. This is now the location of a massive open-pit sand mine. Rowe (1995) recorded a site of this toponym immediately north of the cemetery at Nikolidhes, but this is incorrect, as it should have been ~500 m north, confirmed in 1963 aerial photographs. It appears that cemeteries fully surrounded the *Kafkallia* promontory, including the cemeteries *Nikolidhes* and *Dhrakontospilios*, with this (the most northern) the earliest, while Nikolidhes and *Dhrakontospilios* continued in use after the fortress and settlement at *Kafkallia* were abandoned, most likely by the inhabitants of Glykia Vrysi and Nikolidhes. This site was not included in GIS analyses because of its identification as a cemetery.

26) Meloutzia

MC, MCIII/LCI, LC; Cemetery or Farmstead?

New site located during extensive survey. Too small for intensive survey.

Materials Collected: 22 sherds (RPIII, RPIV, WPIII-V, RS/BS, WS, BR, Cookpot)

This site consisted of < .5 ha dense scatter of ceramics on a shallow slope south of the Alykos River and Glykia Vrysi. Ceramics were a mix of MC and LC plain and fine wares, little building material and no groundstone was observed, so this may be the remains of a plowed out tomb, or detritus washed and plowed down from a cemetery on higher ground. Possibly should have been excluded from analyses, but it was kept for its close relationship with Glykia Vrysi, and to indicate the likely southern extent of settlement in this area.

Potamia

27) Ambelin

CS 680

HWC MC No. 145, LC No. 216; GG No. 241;

MC, MCIII/LCI, LC; Settlement

Located during extensive survey.

This site was located but could not be surveyed because of ongoing agricultural activity, including planted fields and heavy manuring obscuring >90% of the ground surface.

28) Katsikoronia

CS 663

HWC EC No. 135, MC No. 146; GG No. 242

EC; Cemetery

Located during extensive survey. Surveyed intensively (53 units collected)

This cemetery was located, but intensive survey identified only the smallest of Bronze Age components, with just 5 sherds of RP collected. The remainder were Iron Age, Medieval, or later. Catling also only collected RP. The site was excluded from GIS analyses because of identification as a cemetery.

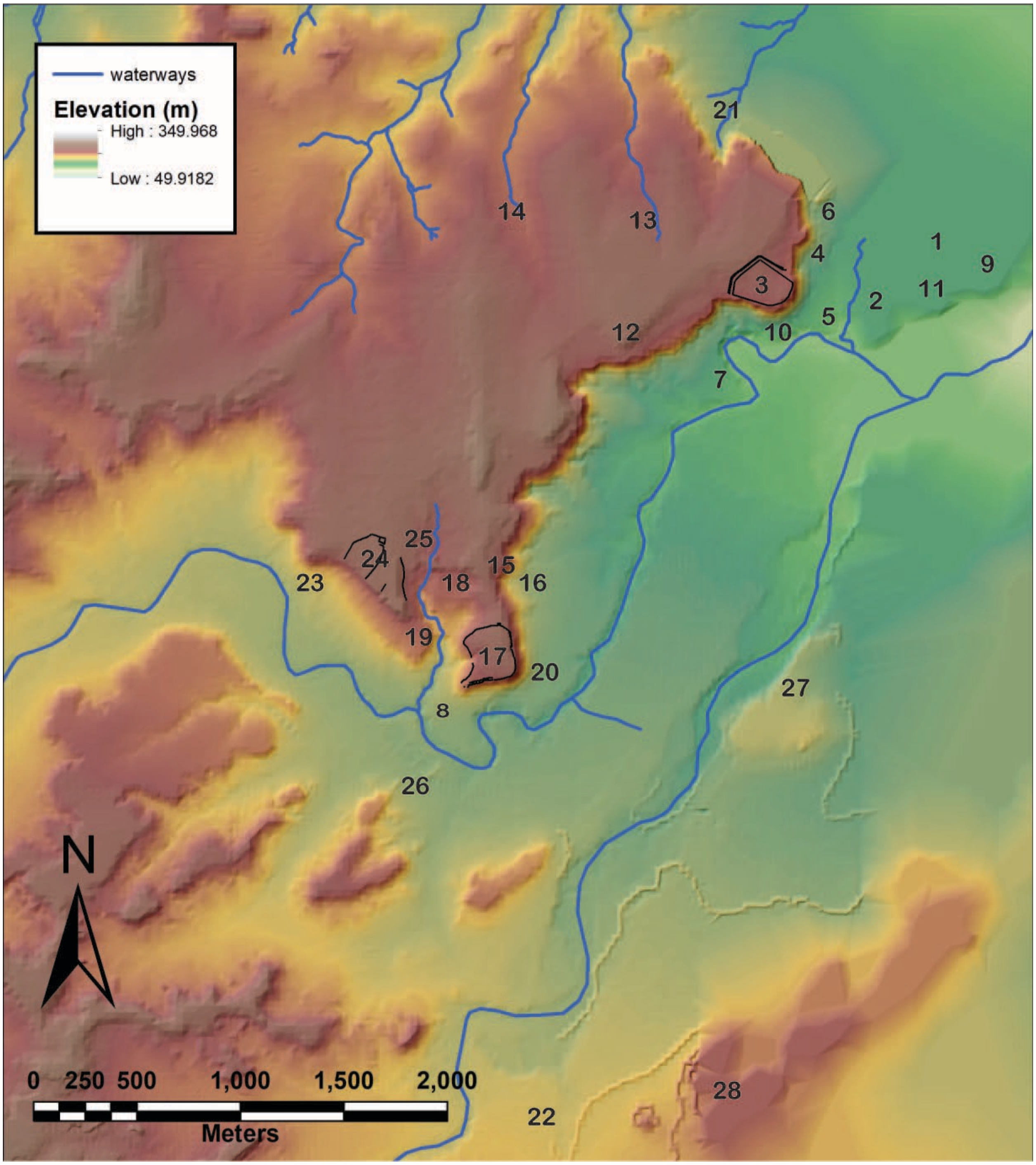


Figure A.1- *Map of the Bronze Age sites in the Agios Sozomenos region. Numbers are coded to the gazetteer.*

Appendix B:
GIS LANDSCAPE ANALYSIS METHODS AND DISCUSSION

Defensive Elevation and Slope

As discussed in Chapter 7, Supernant and Martindale (2019:195) used a radial measure of elevation difference in degrees between the perimeter of a site and the center. Their article indicates that this measurement was performed only for access routes, not the entire perimeter, but this requires that the researcher assess what routes are accessible, and also does not take into account the defensive advantages conferred in directions other than direct access. For example, *Barsak* is inaccessible for roughly 50% of its perimeter, due to the steep mesa on which the site is located, but the elevation in that direction provides a defensive advantage both by limiting access and by providing long-distance views. Future efforts in this direction might benefit from considering metrics for both an average, or "total," elevation advantage, as well as one limited to the portion of the perimeter deemed "accessible."

Bocinsky (2014: 168) prepared a defensiveness index for a landscape using a similar calculation in a GIS, so that each pixel in a raster was assigned a value based on its elevation as compared to those at a Moore distance of r^3 (i.e. the perimeter cells of a 7x7 pixel square centered on the pixel being measured). Neither method was appropriate for the current dataset. Instead, I attempted two simpler methods that might provide more useful information specific to each site. The first method, used in Chapter 7, compared the average elevation of the site with that at buffer at fixed distances of 50, and 100m (Figure 7.1). This same GIS method, if applied with Slope and Terrain Roughness Indexes can be used to measure Accessibility.

Elevation/Slope @ Buffer: Requires DEM raster (and/or Slope raster, TRI raster) and site locations/measurements Create new polygon feature class

1. Digitize feature of the fortress/site area (using wall perimeter from site recording and orthorectified satellite imagery) using Editor – Create Features.
2. Clip elevation DEM to Fortress Polygon
3. Calculate Statistics or use symbology classification under Layer Properties to determine mean elevation of site. Check Standard Deviation to make sure variation is acceptable.
4. Create a Buffer around fortress/site polygon (Editor – Buffer)
5. Convert vertices to points (Data Management – Features – Feature Vertices to Points)
6. Extract values from DEM (and/or other rasters of interest) to Vertices Points layer (Spatial Analyst – Extraction – Extract Multi Values to Points)
7. Calculate Statistics or use symbology classification in Layer Properties to determine mean elevation and slope along perimeter of the buffer. Check standard deviation to ensure variation is acceptable.

The second method I attempted looked specifically at the relationship between the fortresses and the landform on which they were located. First, I considered the difference between the average elevation internal to the enclosure and the elevation at the base of the plateau (determined by the line where the slope becomes low enough for the local farmers to plow), and second, I considered the slope in degrees between the site perimeter and the base of the slope. This method is markedly different from that above in that it requires some sort of qualitative judgement on the part of the researcher as to what portions of the site perimeter or approach that they wish to investigate, and that it also allows the particular variation of the landscape to be taken into account, rather than using a uniform, but arbitrary, buffer. I demonstrate the method here with *Barsak*, having chosen lines representing the perimeter of the site, the middle of the cliff, and the base of the cliff (Figure B-1). The resulting calculations for all three sites are reported in Table B-1) This method is demonstrated here assessing the defensibility provided by the cliffs, but the same method could be used to assess how the elevation/slope/roughness effects the defensibilty of the site along portions of the perimeter deemed "accessible."

<u>Elevation/Slope @ Selected Approach</u>:

Replace Step 4 of method above with the following:

4a. Create polyline feature class

4b. Digitize polyline tracing the contour where elevation and slope will be measured using Editor – Create Features.

	Avg. Elev. (m)	Upper Elev. (m)	Upper Slope (deg)	Mid-Elev. (m)	Mid-Slope (deg)	Lower Elev. (m)	Lower Slope (deg)	Elev. Change (m)
Kafkallia	245	245	10	238	27	221	10	23
Barsak	235	234	8	213	43	184	9	50
Nikolidhes	233	241	7	234	37	194	13	47

Table B.1 - Comparison of fortress elevation and slope changes on cliff-side approach - east for Barsak, south for Kafkallia, east and south for Nikolidhes – as measured using GIS.

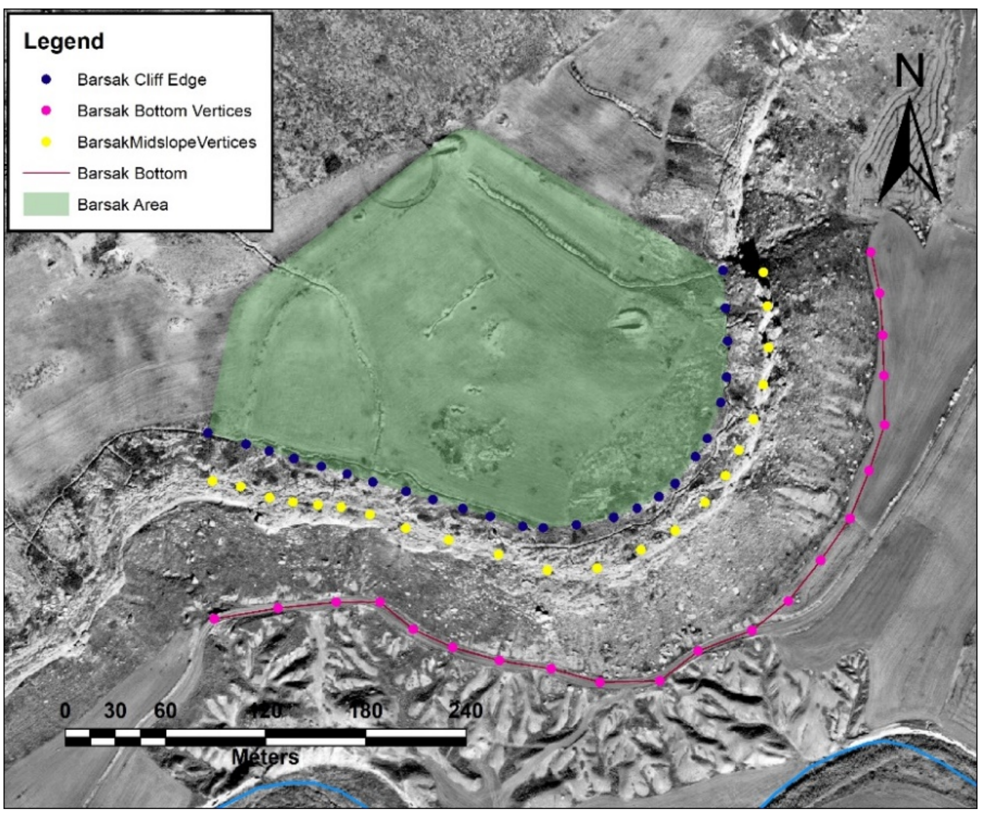


Figure B.1 – *Map of Barsak showing points where elevation and slope measurements were taken for approach defensibility calculations. Blue points on the fortress wall are the location of Upper measurements. Yellow points are the location of greatest slope. Pink points are the location of Bottom measurements.*

Terrain Ruggedness Index

The calculations of slope prepared by the methods above, compared to actual knowledge of the region, revealed a significant issue with the use of GIS for such calculations, namely that the GIS significantly understates the slope of the plateau cliffs. This is due to two factors. First, the DEM used for these calculations was of relatively high resolution, with each pixel measuring 5 x 5 m, but this still represents a significant generalization of the landscape, rather than a high precision and accuracy model of the local details of the topography, and as such inevitably results in significant simplification and smoothing. Second, ArcGIS and other GIS platforms calculate slope using a moving 3 x 3 raster window over the DEM. This means that with a 5m DEM, the slope for each 5 x 5m raster is actually being calculated as the average slope over a 15 x 15m area. In situations of highly variable terrain, like the Yalias river valley and the Ayios Sozomenos plateau, this is sufficiently coarse as to smooth out many features. If a larger scale DEM were used, for example the publicly available 30m DEM, the edges of the cliff would be smoothed much further. As 30m DEMs are used for many archaeological analyses this should serve as a cautionary tale against relying entirely on digital analyses, and emphasizes the benefit, or necessity, of actual site visits whenever possible.

Considering the errors in the calculation of slope within the GIS environment, I sought a better metric to consider the limitations to accessibility conferred by the terrain. This is a problem that geologists and engineers have considered extensively and many solutions have been proposed, including Relative

Topographic Position (Jenness 2002), Standard Deviation of Elevation (Ascione et al 2008), and Relief of Slope (Ruszkicay-Rudiger et al 2009). One tool available is the Terrain Ruggedness Index (Riley et al 1999), which measures terrain heterogeneity. Though originally applied on a far larger scale (100s of kilometers, using a 1 km raster), the authors propose that the methodology itself may be applied at a smaller scale with a higher resolution DEM, and the index adjusted to suit.

The methodology by Riley at al. (1999) measures the difference between a cell and the surrounding 8 cells, by squaring the difference (which corrects for negative differences) between the cells, summing the differences, and then taking the square root. However, the original article on which the methodology was based has a major mathematical error, in that the one time they demonstrate the calculation of the Index they simply sum the difference of the 8 cells and the center cell, without using the method of squares that the article proposes. SAGA GIS has a built-in analysis module, and http://gis4geomorphology.com/roughness-topographic-position/ published steps for using the methodology in ArcMap, both of which produce spurious results due to this error.

Therefore, with the assistance of Dr. Giles Hooker (Cornell, Statistics), I created my own methodology that performs the raster calculations as proposed in the original Riley et. al article within ArcMap. I then improved on this method: As a final step, the value is divided by 8. The resulting TRI raster now has values that represent the difference between the 8 surrounding cells and the center cell, i.e. the normalized Euclidean distance between a flat plane and the measured elevations.

Now, instead of the TRI being the sum of the differences across a 3x3 cell raster, the TRI represents the average deviation between the 8 cell annulus and the central cell. This normalization also has the effect of making the TRI value more intuitively understood: For the purpose of comparison, a perfect even slope of 30 degrees on a 5m raster (i.e. 5 meter rise over 10 m) has a TRI = .7655**. This understanding of the TRI allowed me to set a TRI value of 1 as "highly rugged," whereas using Riley et al.'s method it is difficult to understand the significance of the TRI value as it relates to movement and accessibility.

<u>Corrected TRI Calculation Method</u>: Requires DEM raster

1. Create a raster of the standard deviation (Spatial Analyst – Neighborhood - Focal Statistics – Standard Deviation) of a moving 3x3 cell rectangular window using the DEM of the study region.
2. Create a new raster of the mean (Spatial Analyst – Neighborhood - Focal Statistics – Mean) of a moving 3x3 cell rectangular window using the DEM of the study region.
3. Create a new raster using the raster calculator (Spatial Analyst – Map Algebra -Raster Calculator) with the following formula: Sqrt (square(StdElevRaster) + 9 * (square(MeanRaster – ElevationRaster))/8)

Perimeter Defensibilty

These calculations are of questionable value, but in following the metrics of Defensibilty as proposed by Martindale and Supernant (2014), I wanted to at least consider them. They argue that larger sites may be more defensible because of larger population, but this assumes that site population and area are correlated, and without more data this assumption cannot be made for Cyprus. Martindale and Supernant also suggest that larger sites are *less* defensible because of their longer perimeters, thus requiring more investment in defensive technologies or in guards. This seems a more supportable argument, as well as one that can be empirically assessed. Specifically, the area of a site is related to its perimeter length, but not directly, as the shape of the site will effect the perimeter. A long, narrow site with the same area as a compact, round site, will have a significantly longer perimeter, e.g. a 40 x 10 m site and a 20m x 20m site will have the same area (400 sq.m.) but the 40 x 10m site will have a 100m long perimeter vs. the 80m perimeter of the square site. Mathematically, the smallest perimeter to area ratio is achieved with a perfect circle. Thus, using a circular site as an "ideal" perimeter, one can assess the defensive affordances of site/fortress shape by how much longer the perimeter is vs. the "ideal" site of the same area. First, one uses the measured or proposed area of the site, to determine the radius of a circle with the same area:

Since the area (A) of a circle = Pi * r^2

and the radius (r) = Sqrt (A/Pi)

and perimeter of a circle P = 2 * Pi * r, then the Perimeter = 2 * Pi * (Sqrt (A/Pi))

The resulting "ideal" perimeter can be compared to the "actual" perimeter, as measured archaeologically, and the efficiency of the site shape can be empirically assessed. These numbers are not particularly useful independently, but they may be helpful in assessing how other defensive affordances provided by architecture or landscape are relied on.

Path Distances and Least Cost Paths

Archaeologists frequently use rasterized elevation data to model movement in the landscape using the methods of cost surfaces and path distances built into many GIS applications. The preferred method for many years has been to use Tobler's Hiking Function, an exponential function used to determine walking speed as a function of the angle of slope (Tobler 1993), formulated on experimental data collected by Eduard Imhof (1950).

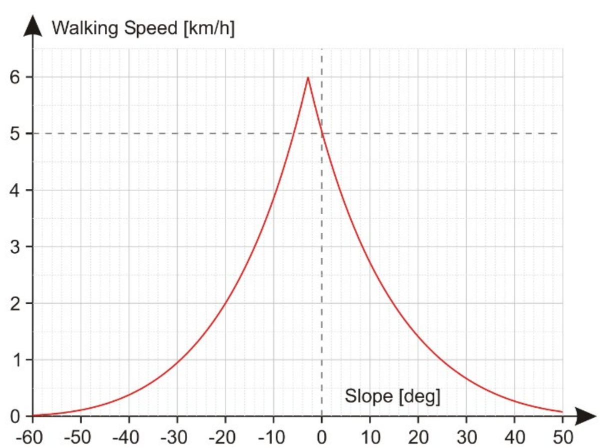


Figure B.2 - *Tobler's Hiking Function, with walking speed as a function of the angle of vertical momentum. Created by Darekk2 [CC-BY-SA 4.0], Wikimedia Commons.*

The formula for the hiking function is:.

W= 6e^ -3.5 * |dh/dx + 0.05|

where

W = walking velocity [km/h]

dh/dx = change in elevation over distance

dh/dx = S = tan (θ)

where

S = slope as rise over run

θ = angle of slope (inclination).

To convert this formula into a vertical factor parameter for cost surfaces in GIS the inverse must be used, so 1 over the result of the above formula, or in excel:

= 0.000166666*EXP(3.5*(ABS(TAN(RADIANS(SlopeValue_cellref))+0.05))))

A complete method for use in ArcMap 10.0 has already been produced by Kaitlin Kahanson:

https://www.academia.edu/7256398/Appendix_E_Toblers_Hiking_Function_Tutorial

based on a tutorial developed by Nicholas Tripcevich for ArcMap 9.0:

www.mapaspects.org/node/3744

The results are a raster with a gradient moving outwards from the point of origin (or destination point if you run the vertical factor parameter in reverse) where the values of each point is the distance measured in hours from the origin.

As discussed previously, however, GIS as a matter of course smooths the surface of the landscape, resulting in significantly lower angles of slope produced with the model than are present in real life. As a result, the path distances produced with this methodology include movement over slopes that humans might normally consider impassable or that they would at least prefer to avoid. Another problem is that the cost of movement in this model is limited to speed, when energy expenditure, and particularly cumulative energy expenditure, would arguably be a better metric. Walking 5 minutes directly up a 45-degree slope might get a person to a point that it would otherwise take 15 minutes to reach by means of a lower-angle switchback route, but no account is made for how exhausted a person would be when they reached the top. Time is used as a proxy for energy, which in cases of low relief terrain may be appropriate, but in highly irregular terrain produces paths that are highly improbable considering the human tendency towards least effort.

I would propose that ideally one should produce a cost surface of the required energy to move through different vertical angles of momentum, and use that to produce the least cost path. Tobler's Hiking Function could then be used determine the time it would take to traverse that route. There is research available concerning the energy consumed by travel at different slopes from which a formula to model such a cost surface might be produced, but this was determined to be outside the scope of the present project. This may be a fruitful direction for future research.

Instead I developed two adjustments to the commonly used methodology that produced routes and travel times that more reasonably model the actual experience of the landscape. This relied on my close knowledge of the landscape in question, and I recognize the problems inherent in adjusting a model to produce the answers that one desires or expects. In this case however, the adjustments to the model seem justified. I present the reasoning and the effects here.

First, recognizing that the DEM does not fully represent the roughness of the terrain in question, I added a 30% multiplier to the slope in the calculation of Tobler's Hiking Function. This means that a 1-degree slope in the Digital Elevation Model was treated as though it were a 1.3 degree slope when calculating pace, and a 30 degree slope was modeled as though it were a 39 degree slope. This results in a 2% increase in the time-cost to pass through raster with a 1-degree slope, but a 225% increase in time-cost to pass through that raster. I argue that this is appropriate, as small variations in low relief terrain have little effect on speed or energy expenditure, but as already discussed, 30 degree slopes calculated in GIS from a DEM may mask much more difficult terrain and in addition to resulting in slower speeds, such rugged terrain will also result in a far greater expenditure of energy which will dissuade people from particular routes. The Tobler Hiking Function already assumes that a hiker will avoid any slope greater than 70 degrees, but the 30% multiplier inserted into the model causes any slope greater than 53 degrees to be excluded.

Terrain this steep is reasonable for an able-bodied hiker, but a 53-degree slope for routine travel between settlements or settlement and resource areas is still extremely unlikely. Modern roads are rarely graded at more than an 8% slope, which is a mere 4.6 degrees. This metric, however, is set to prevent heavy trucks from losing control should their brakes fail, so it is not appropriate for considering the historical movement of people. Instead I considered what might be reasonable limitations on how Bronze Age inhabitants established their routes of movement in the landscape. One such limitation, particularly for an agro-pastoral economy like that of the Agios Sozomenos region during the Bronze Age would be the movement of livestock. Goats can and will climb almost vertical slopes, but research indicates that cattle actively avoid walking on >25 degree slopes (Sheath and Carlson 1998: 276) or even >20 degree slopes (Gillen et al. 1984: 551), and avoid grazing on >10 degree slopes (Mueggler 1965; Cook 1966). Therefore, in order to approximate paths that would have been preferable to humans and cattle alike, a model was produced that excluded movement across pixels with a vertical angle of movement greater than 20 degrees. This exclusion is supported by another available metric for human foot-based movement, which is the average pace for hiking trails in the US national parks. The National Park Service Trails considers trails "strenuous" or "very strenuous" that have an expected average speed of 1.2 mph, or 2 km/h. This aligns with the speed/pace expected on a 20-degree slope according to Tobler's Hiking Function. I would expect that regular, not recreational, travel should not exceed conditions considered "strenuous," and so the 20-degree vertical angle of movement exclusion is supported. The areas excluded in this manner are visualized in Path Distance and Least Cost Path maps (Figures B4 – B13) in red.

For the present project there was also the problem that there is a path from the valley floor to the top of the plateau that is not visible within a 5m DEM. When calculations were run with the absence of this path, they produced far greater travel times from the fortresses to the surrounding villages, which would result in very different interpretations of the relationships between the sites. Because this path was known to the researcher, I was able to compare the GIS results to real world experience in the region and identify the problem. In this instance, I was able to create a polygon sufficiently wide (> 10 m) that joined the top and bottom of the plateau in approximately the correct location, and I used this polygon to splice in new slope values of 20 degrees, that conveyed that this path was passable, if steep. It is not always possible for archaeologists or GIS analysts to be so familiar with the terrain that they are analyzing, but as is often the case with GIS studies, it serves as a cautionary tale against placing too much reliance on results that are not also tested in the real world.

A similar caution must also be voiced regarding the location of river-crossings. GIS calculations will model river crossing based exclusively on slope, and not on the width or depth of the river at that location. Whether these are likely locations for a river to have been forded or bridged is an intriguing question, and the location of such crossings would have significant impacts on travel routes, but is beyond the scope of the present research.

Topographic Prominence

The first method for assessing Local Topographic Prominence was developed to calculate how much of the immediate region around a site is above or below the average elevation of the site. This metric provides insight into how vertically "prominent" a location in the landscape is, as compared to its surroundings. This calculation could be done with a simple buffer around the site as a whole, but because different sites are different sizes and shapes, using a standard circular buffer instead produces values that are comparable. The site itself must also be clipped out of the circular regions, and a percentage above/below calculation is used rather than absolute area. For the present research I used 500m and 1 km regions, though larger regions could certainly be justified.

Local Topographic Prominence**:** Requires Digital Elevation Model, polygons of site areas.

1. Create Point features for central points of sites
2. Create Buffers (e.g. 500m) around points
3. Clip Elevation DEM to Buffer circles
4. Clip Buffer DEMs with Site Perimeters (result are DEMs of circles with the outlines of the sites removed)

5. Create a new symbology for the Buffer DEMs: Layer Properties – Symbology – Classify – 2 classes. Set the classes so one is above the avg. elevation of site, and one is below.
6. Use Raster Extraction to extract the DEM values below the target elevation for a Buffer. Repeat for the values above the target elevation.
7. Use count feature under Classification Statistics to determine Raster Count for DEM above target elevation, and for DEM below target elevation.

<u>Vertical Prominence/Angle of Elevation:</u> In addition to how the site related to the immediate region, I also wanted to consider how the site or building related to the individual viewer. This analysis used Moore's (1996) concept of Vertical Aspect of Prominence. The actual calculation is made simple with a Digital Elevation Model and GIS.

1. Have a Feature Class for each Target Feature (fortress) and a Point Feature Class for the observer points (in this case, identified Bronze Age Settlements). Make sure that the points have Z values, and if they do not, extract them from the DEM of the region.
2. The Construct Sight Lines tool (3D Analyst – Visibility) allows you to input Observer Points, Target Features, and also adjust the height of the target and observer. Select "Output the Direction"

3. The Output Feature Class will be sight lines, and in the Attribute Table for these features will be field for the Azimuth (degrees from North) and the Vert_Angle (degrees above/below the horizon) of the sight lines. Vert-Angle is the field of interest.

Horizontal Prominence/Angle of Aspect: This was a method I experimented with to quantify how the mass of the plateau effected the prominence of the fortresses and how that effect changed with distance.

1. Display DEM so major topographic features may be identified.
2. Create Point Feature Class. Use Editor to create selected viewpoints.
3. Create Line Feature Class. Use Editor to draw lines between viewpoints and the edges of major landmasses. Make sure other landmasses are not blocking the possible view. Create two lines for each viewpoint that mark the extent of the horizontal aspect of the landform being considered.
4. In the Editor Toolbar – More Editing Tools – COGO, use the COGO Report Feature, "Angle Between Two Lines." Click three points to trace the two lines, and COGO will report the angle.

Viewsheds

Directions for completing Viewshed analyses are readily available, so I will not repeat them here in detail, but I discuss the different methods I used in my research, so they may be reproduced or adapted.

Pseudo-Total Viewshed: A Total Viewshed is a cumulative viewshed of every point in the landscape from every other point in the landscape. This is extremely computationally expensive. Instead I used Cumulative Viewsheds from stratified and random samples of points. The more points used, the more closely the resulting Cumulative Viewshed will resemble the results of a "true" Total Viewshed.

Method 1: Gridded Points:

Use the Fishnet Tool (Data Management – Feature Class – Create Fishnet) to create a Feature Class grid. Define the Origin (Upper Left Corner), Y-Axis (defined by the lower left corner), cell width and height (determines the spacing of your points), and the number of rows or columns determines the number of points). Select "Create Label Points" before you run the tool. The fishnet itself is not used, but the Label Points may then be used as the viewpoints for your viewshed analyses.

Method 2: Random Points:

Use Create Random Points Tool (Data Management Tools – Feature Class – Create Random Points) to generate a specified number of points that will be randomly distributed within the boundary of a layer or a specific feature/polygon within a layer. For random points distributed throughout the whole study area, use a polygon of the study area or the local DEM as the boundary feature class. To constrain the random point to a particular region, e.g. the river valley where settlements are located and most travel is expected to occur, create a polygon defining the desired area first, and use the polygon to constrain point placement.

Shared/Cumulative Viewsheds

If a site is represented within a GIS as only one point in the landscape, the viewshed produced from the point will, of course, be limited to what can or cannot be seen from that point. This may be deemed a reasonable approximation for a smaller structure or locale, but for large sites or structures that cover multiple hectares, multiple points should be used to produce the site viewsheds. Personal experience of a location may allow site points to be selected, or evenly spaced points around the perimeter and points of highest local elevation should be used. The resulting cumulative or "shared" viewshed will then indicate what areas of the landscape could be viewed from most parts of the site, as well as letting the researcher know what areas of the landscape could be visible, but only if viewed from select points. As with the previous methods for Pseudo-Total Viewsheds, the boundaries of a site could also be used to generate evenly spaced or random points. A true cumulative viewshed of a site the size of *Barsak* with a 5m DEM would consist of over 6400 viewpoints.

Viewshed calculations within ArcGIS can be limited by means of start distance (RADIUS1) and outer distance (RADIUS2) variables and can be modified for height of the viewer (OFFSETA) and of the observed (OFFSETB). Depending on the Viewshed tool used, these parameters may be set within the tool, or by addition of Attribute Fields to the Attribute Table of the feature class used for the observer points. My analyses limited viewsheds according to limitations of human perception as set by Ogburn (2006), and assumed 5m tall observers (fortress walls) and 1.5m tall observed (people in the landscape).

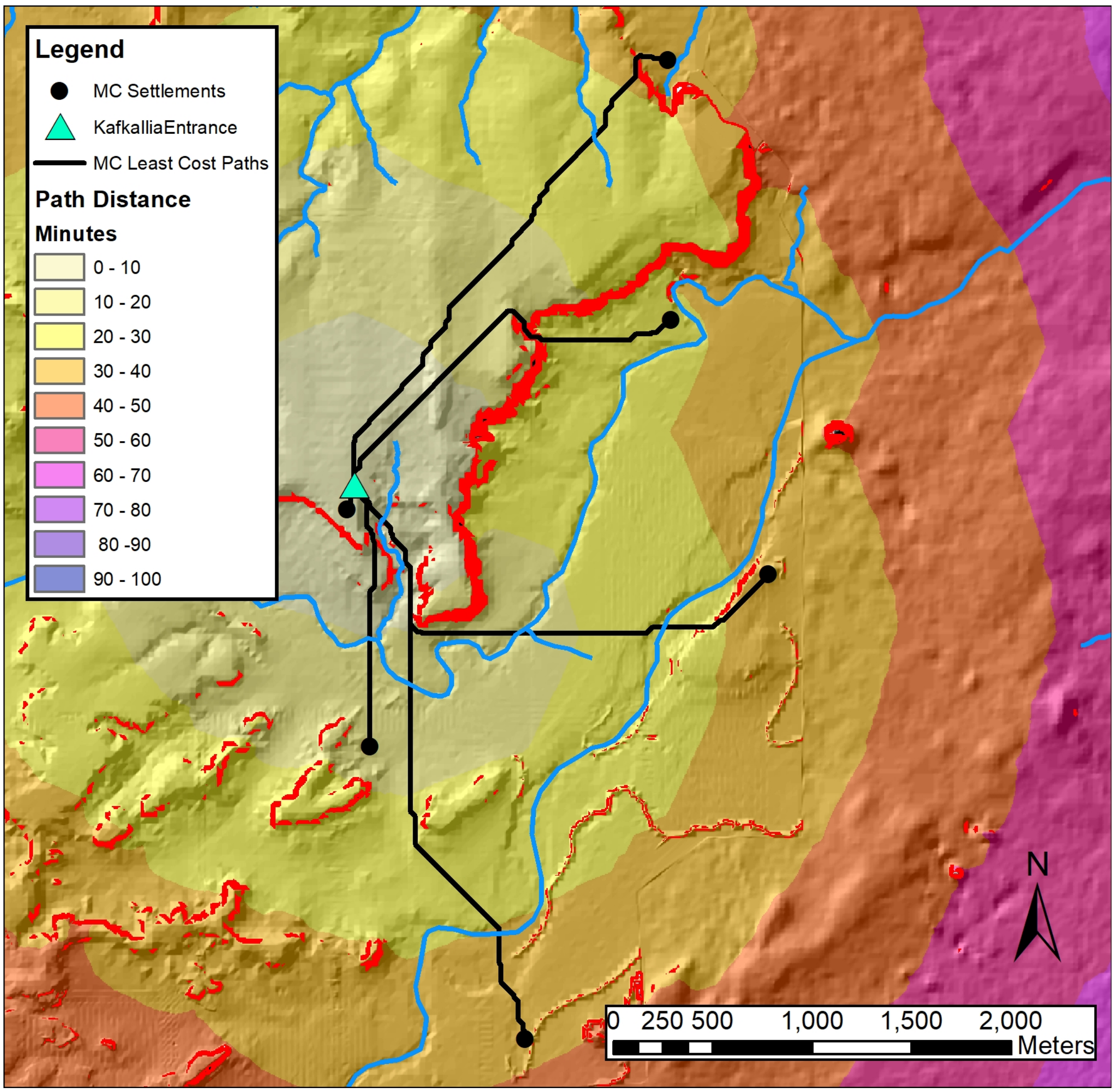


Figure B.3 – Least Cost Paths from Kafkallia to MC settlements

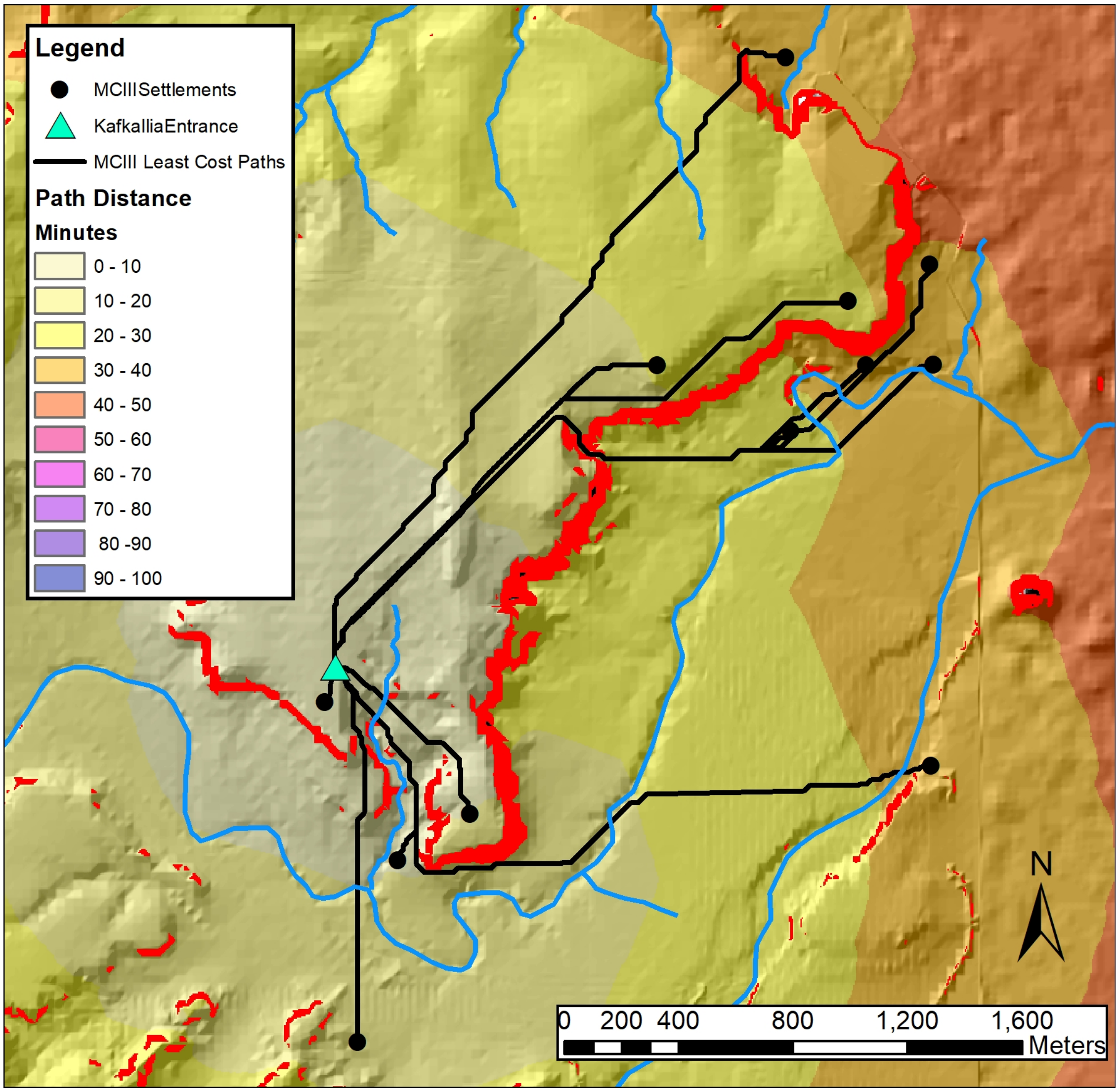


Figure B.4 – Least Cost Paths from Kafkallia to MCIII Settlements

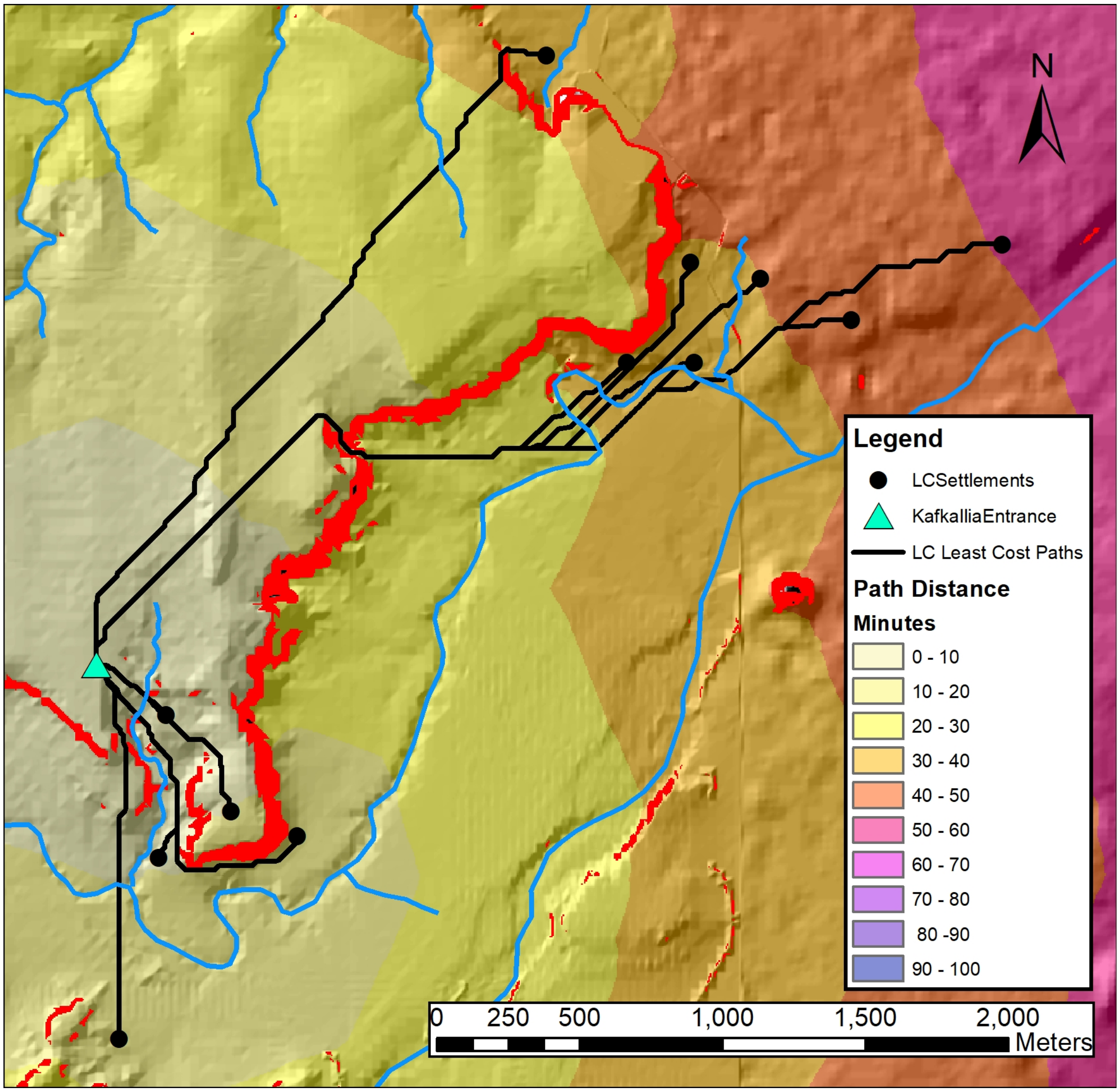


Figure B.5 – Least Cost Paths from Kafkallia to LC Settlements

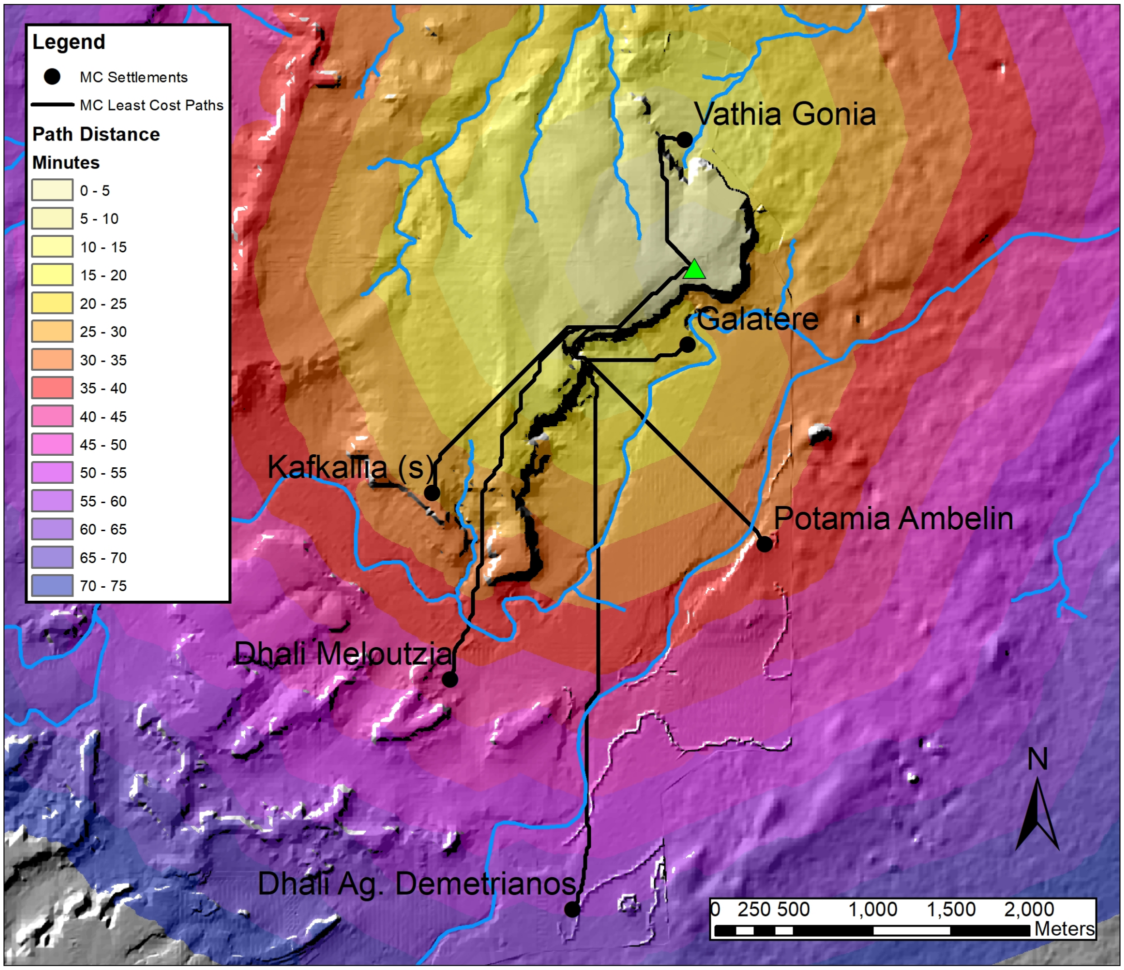


Figure B.6 – Least Cost Paths from Barsak to MC Settlements

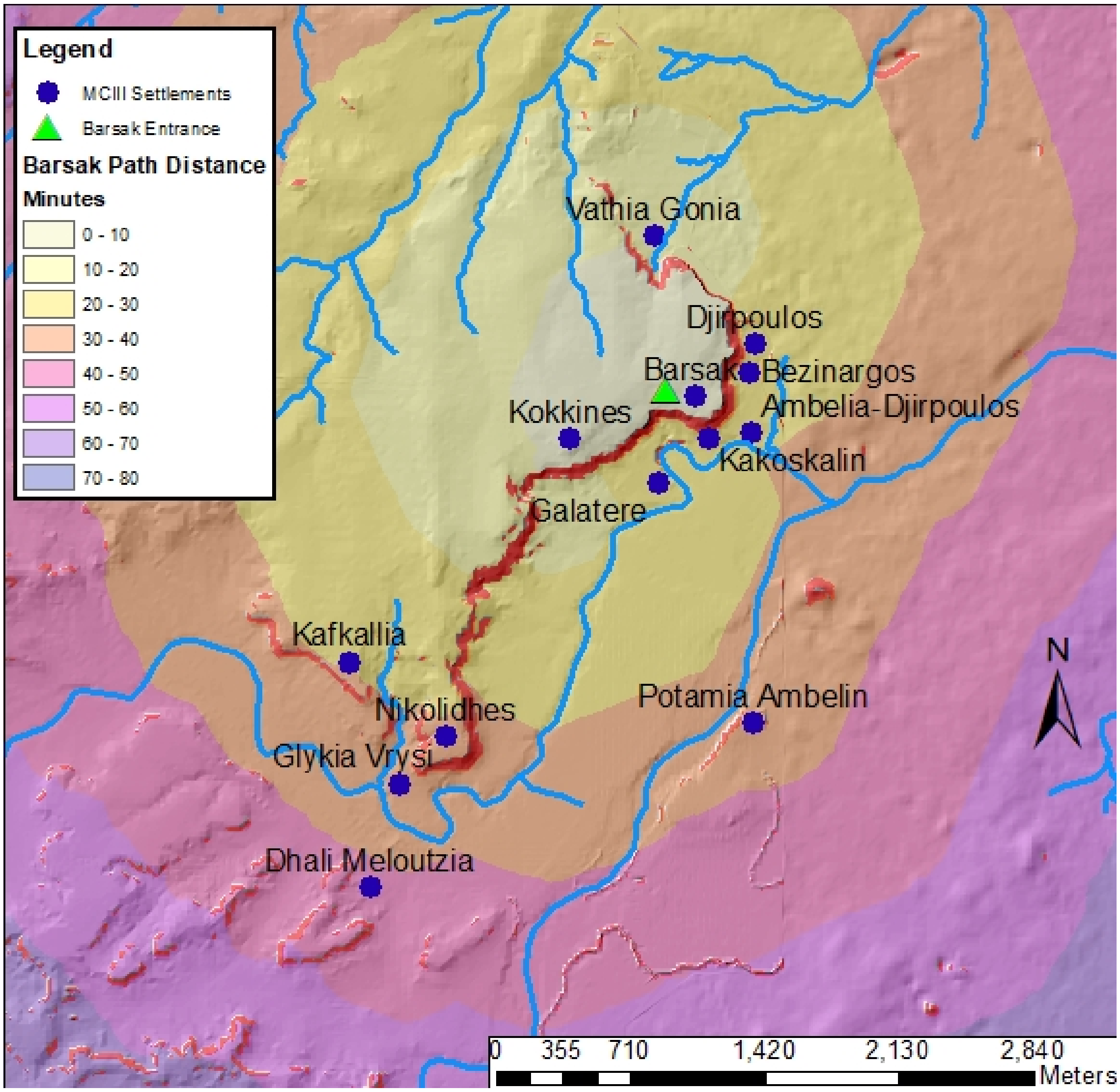


Figure B.7 – Path Distance Map for Barsak and MCIII Settlements

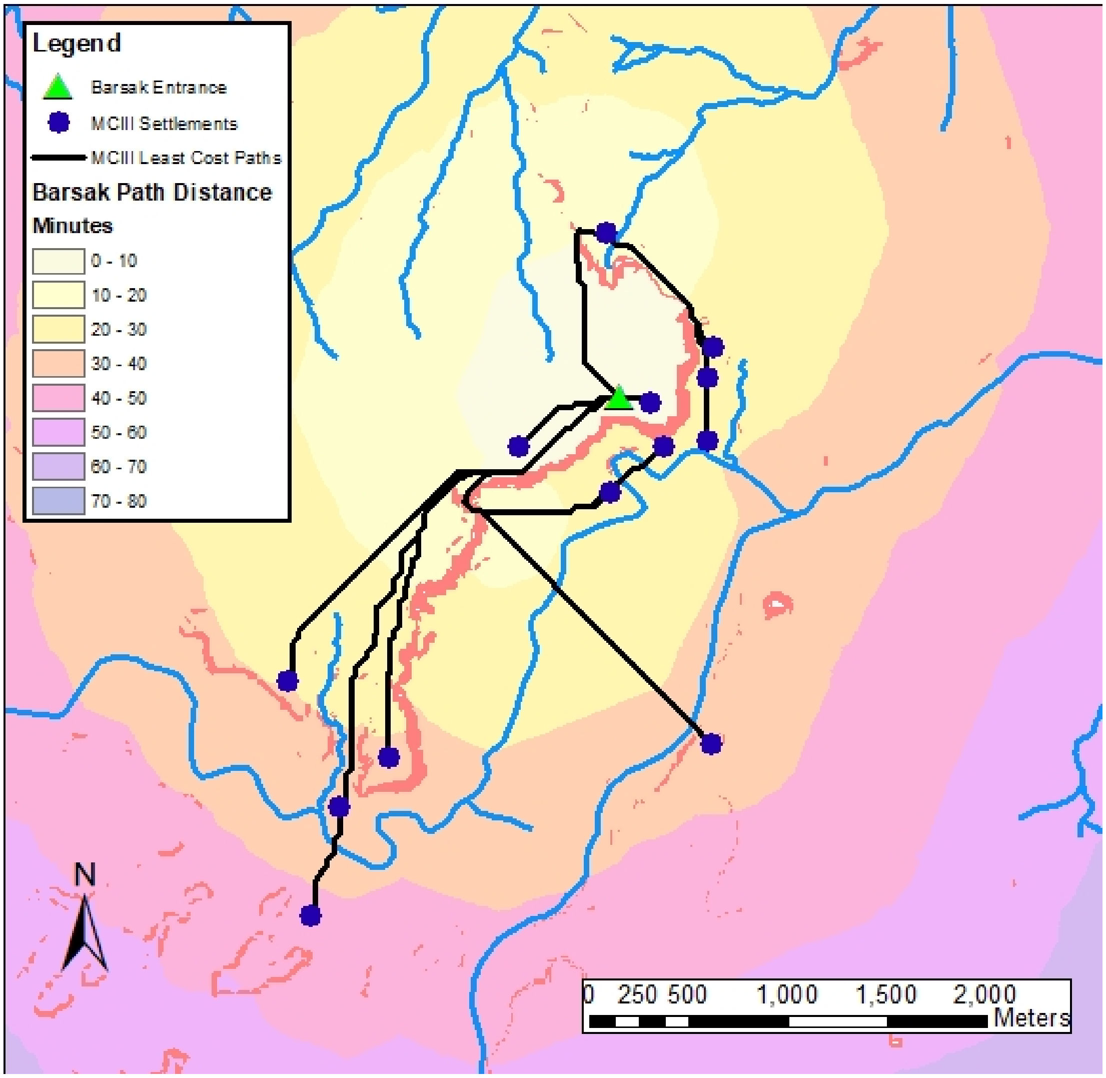


Figure B.8 – Least Cost Paths from Barsak to MCIII Settlements. Red Marks impassable terrain.

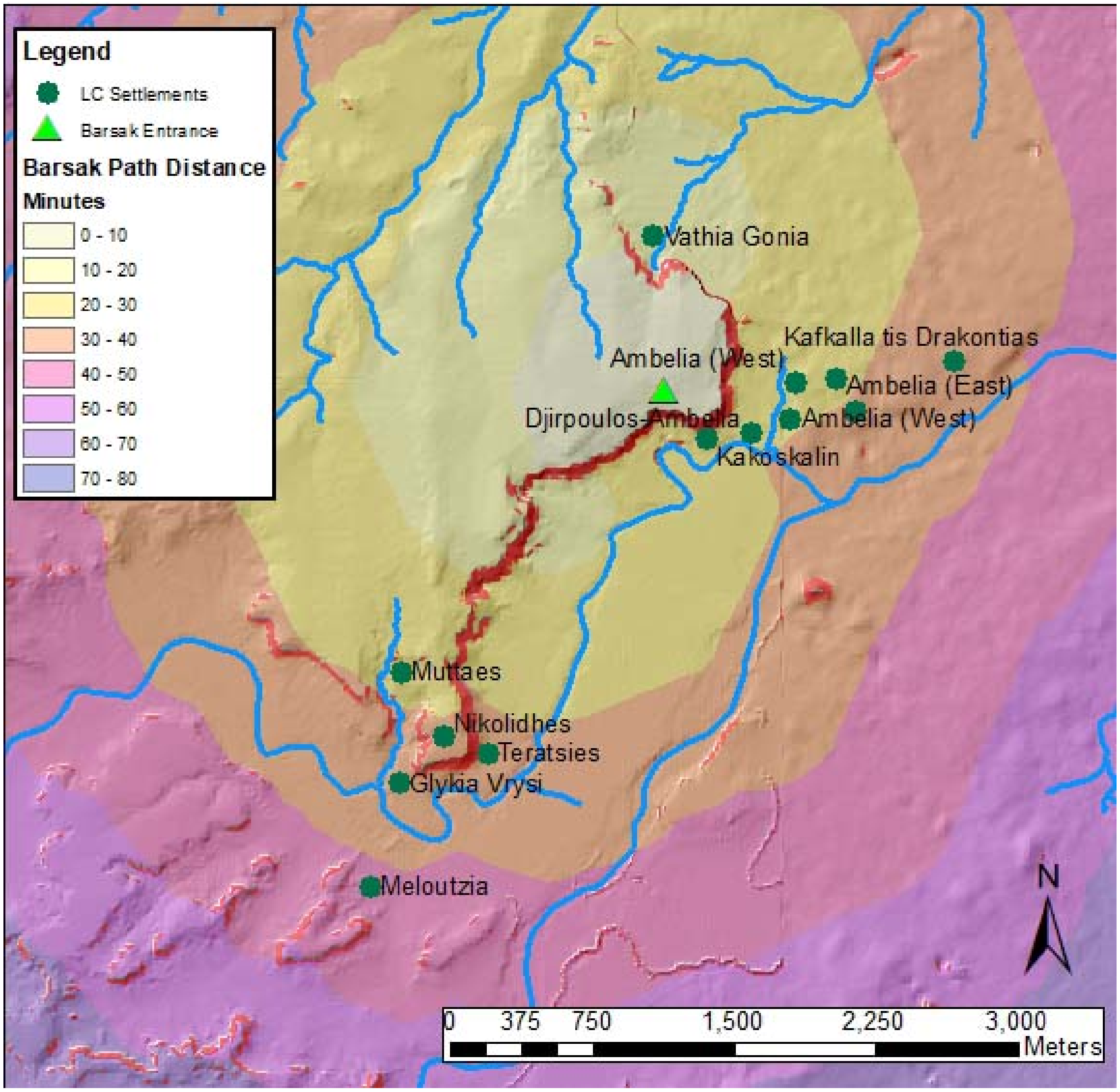


Figure B.9 – Path Distance map for Barsak with LC Settlements

Fig

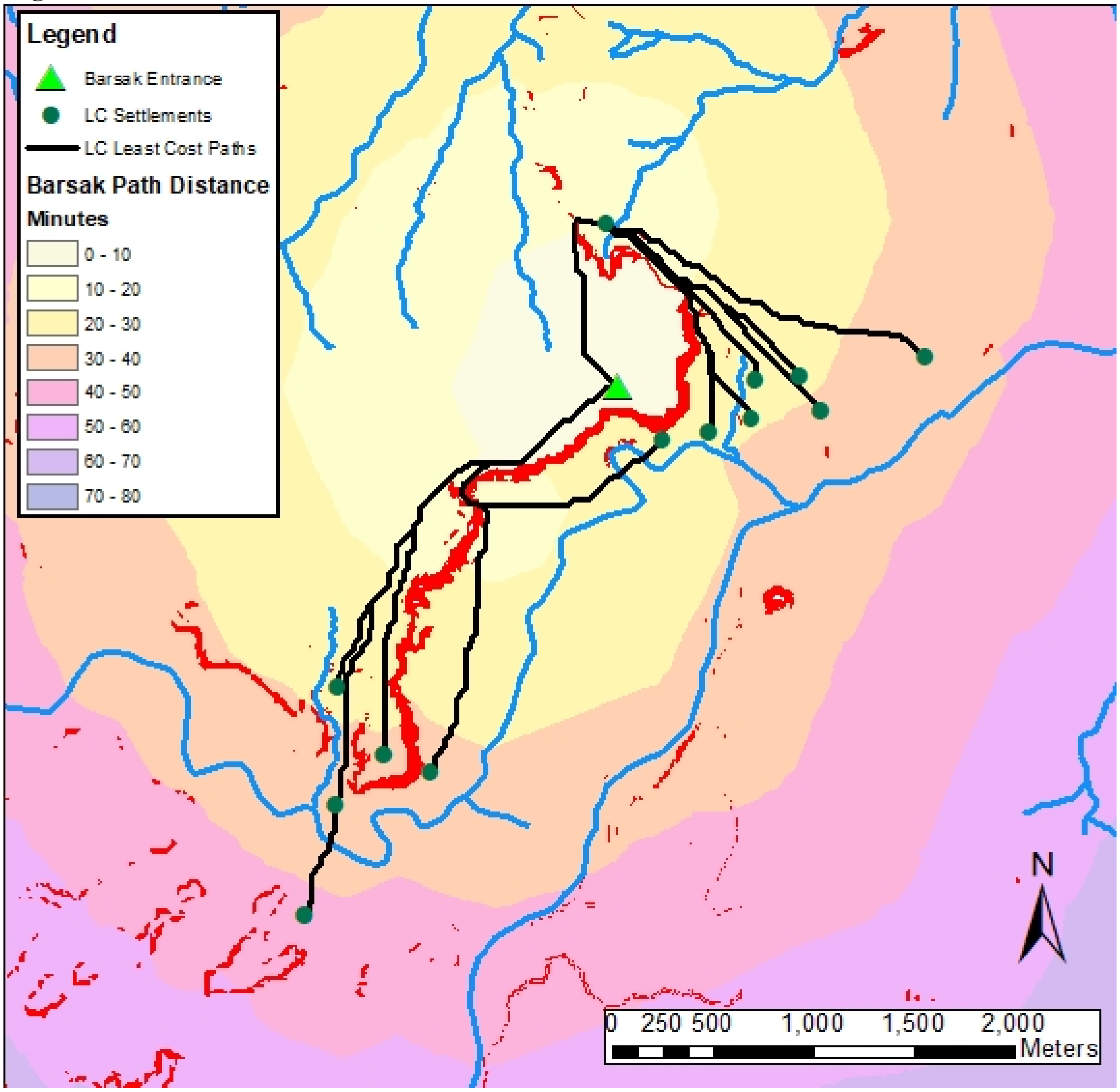


Figure B.10 – Least Cost Paths from Barsak to LC Settlements

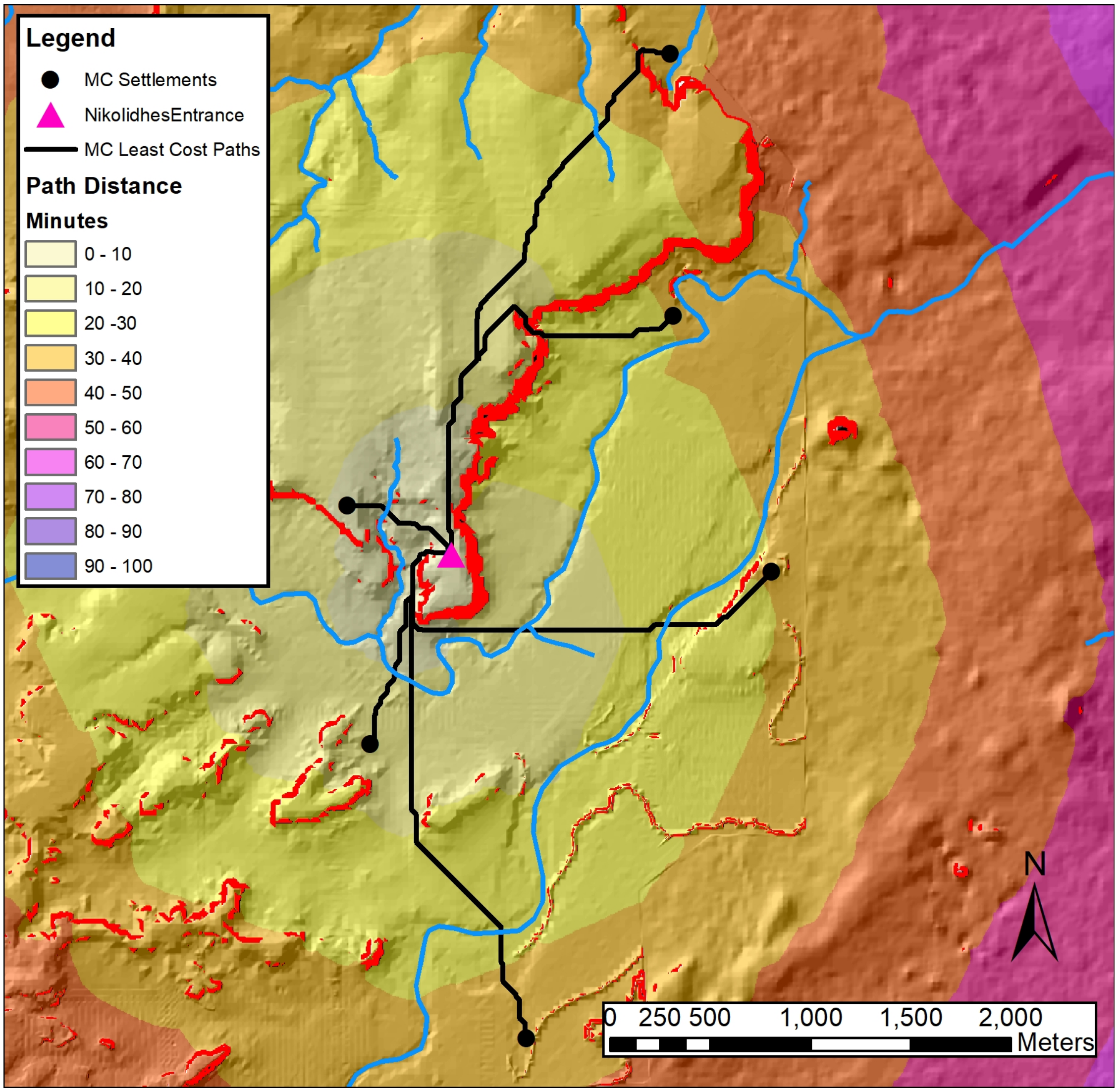


Figure B.11 – Least Cost Paths from Nikolidhes to MC Settlements

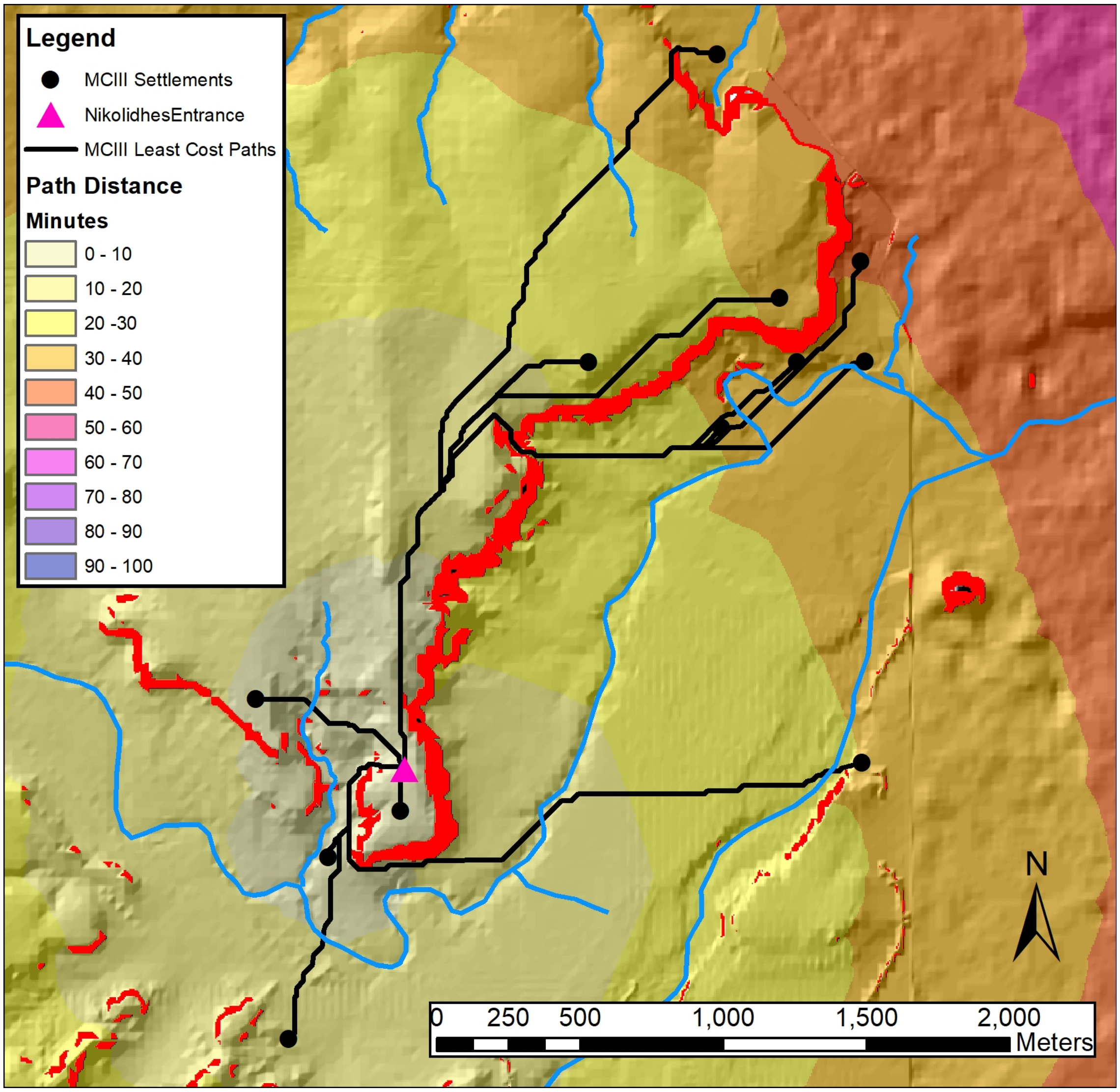


Figure B.12 – Least Cost Paths from Nikolidhes to MCIII Settlements

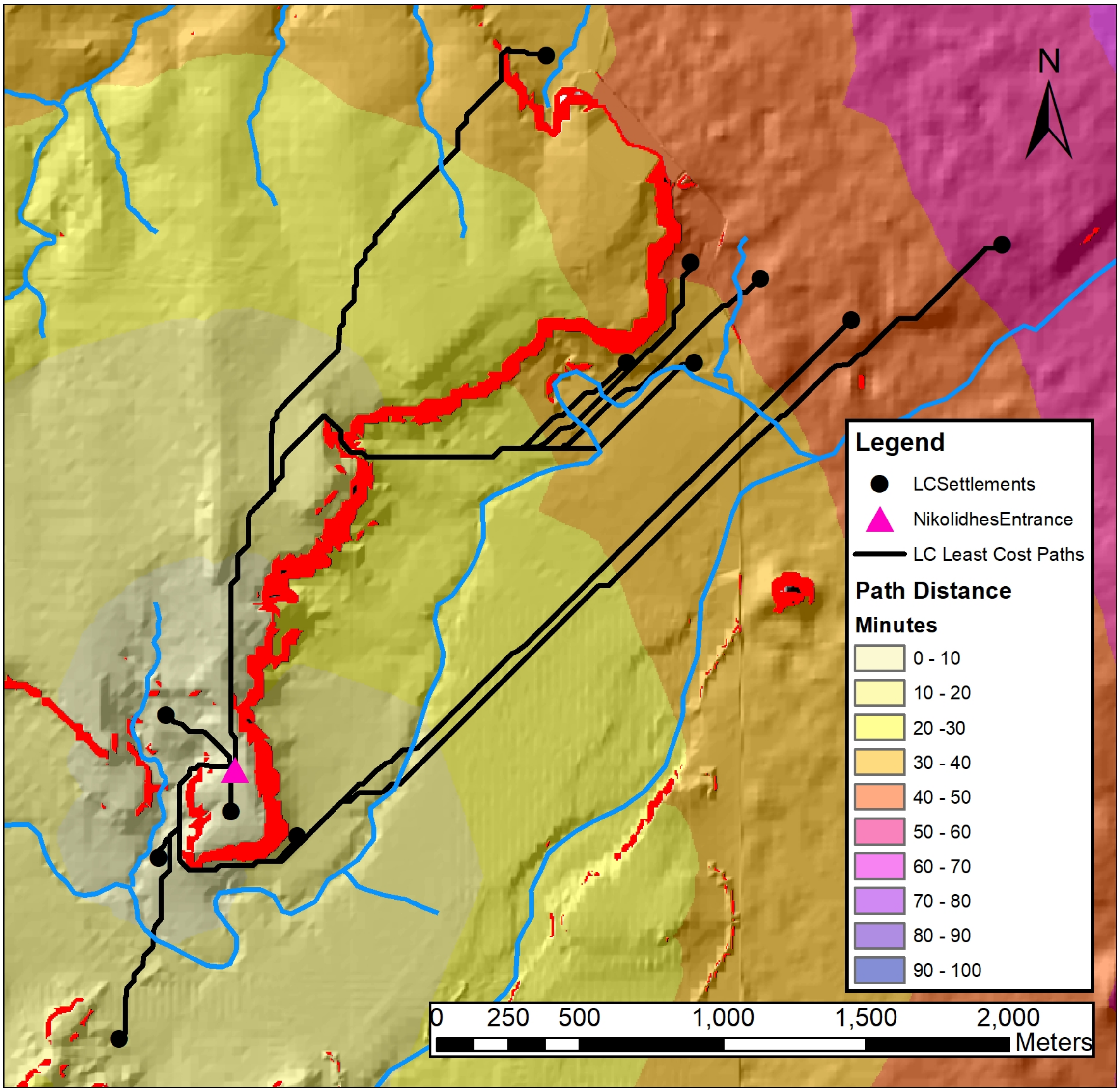


Figure B.13 – Least Cost Paths from Nikolidhes to LC Settlements

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