Games of Thrones:

Board Games and Social Complexity in Bronze Age Cyprus

by

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ABSTRACT

This study frames research on board games within a body of anthropological theory and method to examine the long-term social changes that effect play and mechanisms through which play may influence societal change. Drawing from ethnographic literature focusing on the performative nature of games and their effectiveness at providing a method for strengthening social bonds through grounding, I examine changes in the places in which people engaged in play over the course of the Bronze Age on Cyprus (circa 2500–1050 BCE), a period of increasing social complexity. The purpose of this research is to examine how the changes in social boundaries concomitant with emergent complexity were counteracted or strengthened through the use of games as tools of interaction.

Bronze Age sites on Cyprus have produced the largest dataset of game boards belonging to any ancient culture. Weight and morphological data were gathered from these artifacts to determine the likelihood of their portability and to identify what type of game was present. The presence of fixed and likely immobile games, as well as the presence of clusters of portable games, was used to identify spaces in which games were played. Counts of other types of artifacts found in the same spaces as games were tabulated, and Correspondence Analysis (CA) was performed in order to determine differences in the types of activities present in the same spaces as play.

The results of the CA showed that during the Prehistoric Bronze Age, which has fewer indicators of social complexity, gaming spaces were associated with artifacts related to consumption or specialty, heirloom and imported ceramics, and rarely played in public spaces. During the Protohistoric Bronze Age, when Cyprus was more socially complex, games were more commonly played in public spaces and associated with

artifacts related to consumption. These changes suggest a changing emphasis through time, where the initiation and strengthening of social bonds through the grounding process afforded by play is more highly valued in small-scale society, whereas the social mobility that is enabled by performance during play is exploited more commonly during periods of complexity.

To my mom

whose limitless pride gave me the confidence to start this journey

and whose strength helped me to finish it

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Chapter I: Introduction

Play, as a human universal, has received attention throughout the social sciences, addressing its importance in education, identity, ritual, power, and other spheres of life (Sutton-Smith 1997). Despite this, games have received disproportionately little attention in anthropological and archaeological research. This research project seeks to address a growing corpus of archaeological gaming material in light of anthropological theory, an approach that has not yet been attempted on archaeological material due to a lack of evidence and sparse ethnographic focus on games from which to draw a body of theory. Authors discussing social theory that draws connections between play and broader social processes are disparate and, perhaps because of the lack of attention given to the topic, games and play have been mired in older types of inquiry—particularly within archaeology— such as culture historical approaches. A major goal of this research project is to demonstrate that the study of play and, particularly, board games, is appropriate in the realm of twenty-first century anthropological archaeology, and that scientific research methods, when applied to a body of gaming evidence, can lead to broader conclusions regarding play and society.

The approach taken here expands on research previously undertaken by archaeologists and game historians, discussed in Chapteer II, who have generated a considerable volume of research addressing origins and possible reconstructions of rules for ancient games. The present work engages the archaeological contexts of games for the first time, particularly in settlements, to make broader connections between play and social complexity. A relationship between play and social processes has long been

posited by play researchers, which range from very general arguments that play is "civilizing" (Huizinga 1950: 47–8), to antiquated determinist proposals suggesting that certain types of play exist in more complex societies but are not present in small-scale ones (Roberts *et al*. 1959). These arguments recognized a connection between games and complexity, but were informed by antiquated paradigms of societal change. A major goal of this project, through examination the topic of play in a more sophisticated and rigorous manner, is to legitimize play as a valid area of inquiry that is ripe for discussion and to use it as another line of evidence in discussing social change in the past. Chapter III draws connections between theoretical approaches to play and games in relationship to social complexity, and discusses the avenues by which play is effects and is affected by change.

The corpus of material selected for this purpose comes from Bronze Age (c. 3000–1050 BCE) Cyprus and is the largest body of evidence of archaeological gaming material from a single time period from anywhere in the world, with approximately four hundred examples currently known and more discovered every year. First posited as games by Karageorghis (1975: 875), but then found in considerable numbers at Episkopi *Phaneromeni* and synthesized by Swiny (1980, 1986), limestone blocks with a series of pecked cupules appearing in one of two patterns were argued to be derivatives of the Egyptian games of *senet* (three rows of ten depressions) and *mehen* (a spiral with varying numbers of depressions) and termed “gaming stones.” Since Swiny’s treatment, these artifacts have proven to be ubiquitous at subsequently excavated and surveyed sites from all phases of the Bronze Age on the island (Fig. I.1). The recent discovery of these games is an important factor that provides the ability to examine games archaeologically, since

the overwhelming majority of previously known game boards and paraphernalia throughout the world were discovered in the early days of archaeology and are, thus, without adequate contextual information. The great number of gaming stones from well-documented contexts in Cyprus, in concert with the geographical and chronological range represented, provides an opportunity not previously afforded for the study of gaming in relationship to societal change.

The most commonly discussed social process relating to Bronze Age Cyprus is that of social complexity, which is the focus of Chapter V). It is apparent from the archaeological record that changes in settlement patterns, concentration of wealth, and foreign interaction are evidence for differential levels of socio-economic inequality throughout the island, particularly intensifying toward the end of the period. For the purposes of this study, Knapp's chronological scheme (Knapp 2013: 26–7), which breaks the Bronze Age into two major periods (see Table I.1): the Prehistoric Bronze Age (c. 3000-1700 BCE) and the Protohistoric Bronze Age (1700-1050 BCE), will be used. This periodization more closely reflects the archaeological realities relating to societal change on the island than does the classical Early-Middle-Late Bronze Age schema, which is perhaps a bit too artificial. Archaeological evidence in the form of accumulated metal objects in large tombs suggests that during the Prehistoric Bronze Age (PreBA), material wealth began to be accumulated by individuals or kin groups, particularly on the north coast of the island. Other regions, such as the central plains and the south, did not have as many obvious markers of status and wealth. This status quo changed during the beginning of the ProBA 1, when population shifted toward the south and east coast and kin groups competed for status by accumulating wealth and foreign goods. This process

accelerated through the ProBA 2, when wealth disparity and expressions of power reached their peak on Cyprus, only to undergo a process of slight decentralization during the ProBA 3, followed by the collapse of the Eastern Mediterranean Bronze Age interaction sphere that had made this concentration of wealth possible.

To approach social complexity through gaming, it is important to note that this research does not anticipate ProBA social complexity when discussing PreBA contexts. Others have approached the topic in this manner in attempts to examine the "lead up" to social complexity (e.g., Falconer and Fall 2013). For the examination of play it is useful to recognize that complexity is not necessarily unidirectional or accumulative, and can change in a variety of ways based on a multitude of factors rather than simply increasing through time. The particular social milieu in which people were living was not necessarily marching inevitably toward more complex social systems. Indeed, scholars of Cypriot archaeology do not point to PreBA social processes as a major influencing factor of the development of social complexity during the ProBA but, rather, discuss changing types and frequency of foreign interaction throughout the Eastern Mediterranean world alongside population movements within the island and new interactions between kin groups. The non-linear nature of social change is particularly evident in the light of some of the particular social interactions that are fostered through play, which create situations in which multiple possible outcomes can subvert, accelerate, or maintain social differences. Board games create these interactions between individuals and among a group of spectators. Nevertheless, it is impossible to see the changes in status that individuals experience by playing games, because these changes are more nuanced, intangible, and invisible archaeologically. Despite this, it is possible to examine the social

settings in which people used games to interact with one another. From such interpretations, one can identify the kinds of social interactions were emphasized alongside games. Ultimately, these inferences lead to the identification of the strategies people were using to engage with their social identities through play.

Such strategies are expected to adapt to changes in social complexity because of the increase in number and decrease in permeability of social boundaries that occur in more complex societies. Games often function as a tool facilitating interaction across many types of social boundaries, whether they are kinship, ethnic, religious, or socio-economic (Crist *et al.* 2016b). Therefore, as the types and number of social boundaries change within a society, the strategies people use to interact with each other across them also are likely to change, and this may be visible in the archaeological record by examining the spaces and activities associated with games, which would then provide a basis for interpreting the kinds of interactions that occurred alongside play.

Examination of the theoretical discussions relating to play in Chapter III reveal two major interactive elements of games: grounding and contingency. The work of Tomasello (2006, 2009), Enfield (2006, 2013), and others (Moore and Dunham 1995) demonstrates the uniquely human ability to indicate, focus, and share attention with another person on an object and develop relationships based on that shared experience. This phenomenon is known as "grounding," as the individuals develop a common ground from which they can then interact with one another. Board games are a type of play that is particularly amenable to this kind of process, as they provide objects and actions through which people interact to achieve grounding. The work of Malaby (2003) on Crete suggests that players use grounding to develop relationships and assess their initial

viability through the play of *tavli,* Greek backgammon. Contingency, or the unpredictability of outcomes, is also emphasized (Malaby 2007: 107) as a phenomenon over which players attempt to signal their control. The game itself introduces this unpredictability into human interaction, with contingency relating to actions like dice rolls, unpredictable strategies employed by opponents, as well as semiotic contingency. This form of contingency is most relevant to the study of social complexity, as it refers to the unknowable social impact of others' assessment of an individual's performance during the games, which can have consequences for social standing within a community and among individuals. In essence, Malaby shows that games are a performative action, in which a person tries to effect change on their status both in reference to a single individual (the opponent) and within their communities. Changes in social complexity emphasize or subvert certain types of status differences. By observing the settings in which people attempted to engage with their status through contingency and grounding, it is then possible to make inferences about how the emphasis on status differences changed through time.

To examine ways in which Cypriots may have played games to engage in grounding and contingency to effect and react to the social changes implicit in social complexity, the corpus of gaming stones on the island are reexamined in Chapter IV to reassess the likelihood that they were games in the first place. Swiny's argument was based on the similarity of the patterns of cupules on the stones to Egyptian games, but this research undertakes a more comprehensive examination of the morphology, archaeological evidence for mechanisms by which they could have reached Cyprus from Egypt, as well as archaeological contexts, which ultimately support Swiny's original

conclusions. Such methods are meant to be an example for identifying games in other regions, such as Crete or Azerbaijan, where similar artifacts have been posited as games but are not easily identified as such in prehistoric contexts. In addition to identification, this discussion places games from Cyprus, which include not only *senet* and *mehen*, but also the Levantine game of twenty squares and the Aegean game 12-Ring, within their regional context historically and materially. It is important to note that, though these games may have originated outside of the island, their original social contexts (such as religious use of *senet* and *mehen* in Egypt) were not necessarily transmitted along with the games (Crist *et al.* 2016b). Instead, they became part of the Cypriot cultural milieu and are best discussed in relation to the social processes that were experienced by the Cypriots playing them, rather than that of the Egyptians, Mesopotamians, Minoans or Levantine peoples from which the games had their ultimate origin. The experiences of people playing games in those societies may not translate to that of those living in Cypriot society. Indeed, basic changes in games are likely to happen when they cross cultural boundaries, as innovations have been found to occur when games are trnamissted across cultural boundaries (de Voogt *et al.* 2013), so the rules, for example, of Egyptian and Cypriot *senet* cannot be assumed to have remained the same once the game was adopted into a new culture.

Once situated in this way, the particulars of social complexity in Cyprus are discussed in Chapter V, along with those themes that are amenable to discussions of grounding and contingency. Essentially, the types of interaction that are most relevant are: feasting occasions, intra-island interactions, foreign interaction, and the organization of space. In reference to both PreBA and ProBA settings, these practices and interactions

differed, and it is posited that the patterning of games in relationship to archaeological contexts that feature these kinds of activities is altered with concurrent changes in social complexity.

The form that games took in Bronze Age Cyprus, as well as their treatment by archaeologists, present difficulties in approaching an artifact class that is, in some ways, ambiguous and also inconsistently documented. Other cupped stone artifacts throughout the region had multiple uses, and it is imperative to separate the Cypriot corpus from them in order to determine the likelihood of their use as games. To achieve this, a systematic process of cataloguing, description, and measurement was required, sdescribed in Chapter VI. Doing so facilitates the present research project and informs future work. While gaming stones have proven to be a ubiquitous artifact type at Bronze Age sites since their description by Swiny, they have not been adequately cataloged in a consistent manner in excavation reports. Furthermore, a lack of theoretical engagement of this material has not inspired the consistent collection of metrics that are necessary for appropriate study of play because relevant measurements and properties have not been identified. In some cases, basic descriptive information, such as the game that was represented on the artifact or the portion of it that was preserved, was absent.

Building from the discussion of play's relationship to social complexity and the archaeological record on Cyprus, it was determined that identifying spaces in which games were played should be the first step in assessing the types of activities that were associated with gaming. Doing so would allow for the determination of other cultural practices concomitant with gaming, and by determining changes in these activities through time, it would be possible to establish that Bronze Age Cypriots used games

socially in order to effect and react to social change. Since the gaming stones from Cyprus represent a wide range of sizes, some of which are easily portable, while others are much too heavy to have been meant to be carried regularly, excavated games were weighed—along with many games which came from surveys—to determine which games were unusually heavy. Extrapolating from this assessment, it was then assumed that the spaces in which they were found were places in which people played games. Similarly, multiple examples of a game in the same space were taken to indicate gaming spaces.

Once likely gaming spaces were determined, it was then necessary to gather, from published and unpublished material, counts of artifacts found in the same spaces as gaming stones—including those which were not determined to be gaming spaces. Then, using correspondence analysis (CA), a multivariate analytical method which measures the statistical distance between rows and columns in a two-way table, patterns in the data would be found, with associations made among spaces, as well as between spaces and artifact types. From these results, described in Chapter VII, the kinds of activities which accompanied games, as well as the types of spaces in which they were played, would be compared. When performing CA separately for PreBA and ProBA sites, differences in gaming practices would be determined and conclusions were made in reference to changes in feasting, foreign interaction, the use of space, and intrasultural inreraction that were occurring on Cyprus during those periods.

Interpretation of the results of the CA, the focus of Chapter VIII, in light of grounding and the harnessing of contingency, provided insights on the strategies people used to resist or enable social change, or, alternatively, to maintain the status quo. Indeed, through the act of play, people engage in some of the main actions that archaeologists use

to describe changes in social complexity: the ways actors exploited inherited forms, evaluated their options, and created new forms in reaction to new realities (Yoffee 2005: 197). Furthermore, humans, the objects required to play board games, and the spaces in which they played become entangled through time, and changes in these entanglements, especially when they increase, may lead to increasing rates of social change (Hodder 2012: 176–7). In Chapter IX, improvements on data collection are discussed, as well as possibilites for future work on play and games in archaeology.

Through the use of statistical methods in concert with sophisticated theoretical models, research on games can inform other avenues of anthropological and archaeological inquiry. Using the Cypriot material as a laboratory for the study of games due to the wealth of data it affords, this research may inform future work on games in other regions and time periods where data is scarcer and may even inspire the discovery of more evidence for play. Social complexity provides a tool to understand how play produces and resonds to change in society This study is intended to function as a first step in a direction of more robust discussion of the role of play in human interaction.

Chapter II: Play and Games in Anthropology

1. Play

The topic of play has long received anthropological scrutiny through both sociocultural and archaeological methods of inquiry. As in any topic of research, approaches to the concept of play have evolved with current trends in scholarship as the discipline itself has changed, bringing greater rigor to the methodology and more theoretically informed approaches to the study of this fundamental part of human existence. Among the struggles scholars have had in exploring play are: defining it, contrasting it with other social processes, and determining the relationship it has with said processes.

Early in the history of anthropological scholarship, the phenomenon of play was not itself a major focus of inquiry. Scholars focused, rather, on identifying types of play in various cultures worldwide. E.B. Tylor, one of the founding fathers of modern anthropology, was one of the first to take an interest in the importance of play in culture. He wrote two of the earliest examinations of games, one discussing games more generally (Tylor 1879a), and the other focusing on the ancient Mesoamerican board game *patolli* (Tylor 1879b). He examined specific games worldwide and looked for their origins, in an attempt to provide a history of games. Often, his assumptions betrayed his evolutionist viewpoints, suggesting that indigenous games had origins in Western or ancient Old World cultures. For example, he suggested that lacrosse in the Americas was a derivative of French hockey games (Tylor 1879a: 740). In his work on *patolli*, a game popular in Mesoamerica up until the Spanish Conquest and chronicled in codices, Tylor's

main argument was that the game, based on its morphology, must have had its origins in *pachisi*, a game known from India (Tylor 1879b: 128; 1896).

Tylor's discussions do not allow for independent invention of similar games. Even as late as 1966, the origin of *patolli* was misattributed to Asia (Hoebel 1966: 76), but this argument has since been refuted (Erasmus 1950). Nevertheless, Tylor's argument that games can cross cultural boundaries, while overstated, is an important one that allowed future scholars to draw comparisons between games. He also was one of the first scholars to compare forms of play cross-culturally (Tylor 1880), and while he did not categorize types of play *per se*, his work in drawing comparisons between the ways in which different cultures played influenced subsequent researchers who actively sought to identify play types in human cultures worldwide.

Following in Tylor's footsteps was Stewart Culin, perhaps the early anthropologist most connected with the study of play. Focusing particularly on non-Western populations, he attempted to document the forms of play within cultures comprehensively (Culin 1889; 1891a; 1891b; 1893; 1894; 1895; 1896; 1898; 1899; 1900; 1903; 1907). While Tylor was generalizing in his discussions of particular forms of play, Culin recorded specifics of equipment, rules, and actions, as appropriate, providing a rich corpus of descriptions of how these particular games were played. Given the great extent of his cataloguing, he was able to categorize forms of play into different types. In *Games of the North American Indians*, he employed four major groupings: games of chance, games of dexterity—based on his judgment of the importance of randomization—, physical skill, and "minor amusements," which include children's games and less formalized play (Culin 1907). Culin's work has been incredibly influential. His methods

of describing the materials, actions, and rules of types of play pervade ethnographic accounts of games that followed his work.

Anthropologists often coupled the diffusionist underpinnings of Tylor's work with Culin's classificatory approach during the first half of the twentieth century, though play was not a major focus of research during this time period. The work of H.J.R. Murray, in his *History of Chess* (1913), used historical and archaeological records as well as anthropological evidence to trace the origins of this game while documenting its different forms through time and space. It is one of the most comprehensive works of its kind, employing Culin's method of cataloguing different types of games for the purpose of demonstrating a diffusionist argument, namely that European chess originated in India. Murray was able to demonstrate the changes made in the game through time and space by tracing it from India to Europe (as well as throughout Asia) avoiding simplistic arguments based solely on form, and relying, rather, on demonstrable historical connections between the originating and receiving cultures.

Herskovits was another anthropologist who examined the transfer of games to different regions.. He focused on the game *wari*, a board game played in the Caribbean, and described the modes of play as well as the materials and actions taken during the course of play, much like Culin's work. He also emphasized it as an example of the "tenaciousness of games," as the Caribbean versions appear to be derived from West African examples (Herskovits 1932: 23). He made a similar argument for another game in Dutch Guyana (Herskovits 1929), further demonstrating this emphasis on finding origins, drawing connections, and describing the act of play itself.

With increasing knowledge of play in cultures throughout the world, anthropologists began to examine the importance of play in culture. Occasionally, anthropologists mentioned the cultural contexts in which play took place, and spoke to the wider consequences of play. Driberg (1927: 169) mentions that he witnessed an occasion of play in what is now South Sudan, where a delegation of Tototha people visited a Didinga village, and the play of a game of *choro* "proved a solvent of social maladjustments," where the Totoha and Didinga were actively hostile to one another before the game but became amicable towards each other during and after play. He also points out the "sociological value" of play, in that a skilled player is awarded a certain level of prestige that is on par with that of an accomplished hunter. He noted that shared rules between neighboring groups enabled "a footing of intimacy without the ability to converse" (Driberg 1927: 168). Snoxhall (1937: 281) mentions the importance of a game in the coronation ritual among the Buganda. It is this type of discussion of games that is most common among ethnographic literature: games or play are mentioned in passing but rarely receive the attention required to make wider inferences about the role of play in culture. Lessner (1933) studied the hand game associated with the ghost dance of the Pawnee and noted the ways in which its social context changed from focusing on gambling to one of ceremonial significance as Pawnee culture became further removed from its older traditions.

These early anthropologists did not attempt to define play or its underlying roles in human existence. This is likely due to prevailing Western attitudes toward play. Cross (2008) notes that the Industrial Revolution changed Western attitudes towards play, indicating that it was a time during which the dichotomy of work versus play was created,

enforced and entrenched by the necessities of productivity for employers. There is little evidence that early anthropologists challenged this construction at the time, though beginning in the second half of the twentieth century the nature of play would become a more important topic for researchers. Nevertheless, accounts discussing games in various cultures continued along the lines of Culin's, but with touches of anthropological interpretation well into the twentieth century (And 1979; Merriam 1953; Pankhurst 1971; Popova 1976; Salter 1974; Tournay and Tournay 1971). With mounting evidence, however, new opportunities arose for the synthesis and examination of the roles of play in relation to social change, both in how play is affected by and how it effects change in turn.

With increasing documentation of forms of play across the globe, scholars began to examine the nature of play in greater detail, attempting to define it and to measure its importance for human society. Perhaps the most influential of these researchers was Johan Huizinga, whose book *Homo Ludens* (1950) essentially began the conversation on the importance of play for anthropologists. He defines play primarily by its "non-seriousness," though recognizing that this contrast can be difficult to observe (Huizinga 1950: 5). After identifying some main characteristics of play and moving on to discuss how institutions such as law, warfare, art, philosophy, and, indeed, culture and complex society ("civilization" in Huizinga's terms, in line with contemporary linear cultural evolutionist viewpoints popular in anthropology) are imbued with play, he argued that the origins of complex society can be seen as arising from play (Huizinga 1950: 173). An important implication throughout Huizinga's work was the idea that play is more of a mode of existence rather than something entirely separable from everyday experience.

One of Huizinga's key ideas is that play involves tension (Huizinga 1950: 10–1, 47–53). A degree of uncertainty surrounds all forms of play; the player(s) is (are) attempting to achieve a certain goal, and the attainment of this goal is contingent (Malaby 2007: 107) on factors which may or may not align for the player(s) to achieve the desired outcome. This tension is variable depending on many factors, such as the stakes of the outcome (e.g., in gambling), the number of players involved, and the social importance of the type of play that is occurring, which can be great or relatively inconsequential. He sees the agonistic struggle and uncertainty that is a fundamental element of play as a way in which individuals can gain prestige in a society, by achieving a desired outcome in an act of play (Huizinga 1950: 53–75). In his mind, the development of complex society brought about more "seriousness" into peoples' lives, which assigned a secondary place to play (Huizinga 1950: 75). While overly generalized, this was one of the first times that a scholar suggested that play was affected by outside cultural processes and that social complexity would be influenced by play and vice versa.

Other scholars sought to examine the relationship between types of play and social complexity. Roberts *et al.* (1959) examined the existing literature and found 82 instances worldwide in various time periods where there was some information on games—a specific type of play which they defined as " a recreational activity characterized by organized play, competition, two or more sides, criteria for determining the winner and agreed upon rules" (Roberts *et al.* 1959: 597). The games discussed were then categorized as games of chance, strategy, or skill, using specific criteria that the authors deemed to be the predominant factors necessary to win the game. Based on their sample, it was concluded that there was "a relationship between games of strategy and

social complexity, but this relationship does not hold for games of chance or physical skill" (Roberts *et al.* 1959: 601). Furthermore, they saw the presence of games of chance as related to religious activities and games of skill being environmentally determined (Roberts *et al.* 1959: 604). Taking these assertions to the extreme, saying that "games of strategy are associated with large local communities…(and) do not tend to appear until the societies have crimes that are punished by the government" (Roberts *et al.* 1963: 187–8) went too far, and subsequent ethnographic inquiry has since refuted these claims (Townshend 1986: 2–3). Nevertheless, these studies reflect increasing rigor in the study of games through the inclusion of scientific and statistical methods that anthropologists began to adopt more readily during the post-war period.

Caillois (1958) made a stronger attempt at classifying types of play. He defined play as an activity that holds six essential characteristics: that it is free (not obligatory), separate (with fixed limits in space and time), uncertain (its course cannot be known beforehand), unproductive (creating no wealth or elements of any kind), governed by rules, and make-believe ("a special awareness of a second reality or of a free unreality, as against real life") (Caillois 1960(2001): 9–10). His view of play is firmly embedded in the paradigm of a work/play dichotomy (Malaby 2009: 206), as he explicitly states that "play is an occasion of pure waste: waste of time, energy, ingenuity, skill, and often of money" (Caillois 1960(2001): 5). Nevertheless, Caillois offered a more nuanced system of categorization than that offered before, splitting types of play into four groups: *agon* (competition), *alea* (chance), mimcry (simulation), and *ilinx* (vertigo) (Caillois 1960(2001): 14–26). The innovation of Caillois' system is that within each category of his scheme, he allows for types of play to exist along a spectrum from what he calls

paidia, "spontaneous manifestations of the play instinct," to *ludus*, a more formalized type of play usually bounded by rules, with the implication that the game can be mastered (Caillois 1960(2001): 27–33). He argues that those types of play that are farther on the *ludus* end of the spectrum have a "civilizing quality," and "they reflect the moral and intellectual values of a culture, as well as contribute to their refinement and development" (Caillois 1960(2001): 27). Despite his theories being entrenched in the Western work/play dichotomy, Caillois recognizes that forms of play can be institutionalized into social life, arguing that ritual, stock market speculation, and competitive examinations all have some form of play element to them (Caillois 1960(2001): 43–54).

While these generalizing accounts were helpful in synthesizing the research of early twentieth century play catalogers, ethnographic research continued but, in some cases, focused more heavily on particular types of play, on finding the meaning behind them and on understanding how they reflect the realities of society. One of the most influential of these studies was that of the Balinese cockfight by Geertz (1972), which he found to be representative of Balinese culture. He describes it as "fundamentally a dramatization of status concerns," as reflected in aspects of the cockfight itself. This is evident from restrictions on who could bet on which birds and which birds were allowed to fight one another based on the kin-groups their owners belonged to (Geertz 1972: 18–22). It is a "metasocial commentary" on the status structure, and it is "interpretive…a Balinese reading of Balinese experience" (Geertz 1972: 26). He draws a comparison between art, literature and play, whereas other theorists suggest art and literature are themselves forms of play (e.g., Huizinga 1950: 119–35, 158–172). When enacted and reenacted, the spectator can "see a dimension of his own subjectivity," growing ever

more familiar with it and drawing meaning from the play, which is a "paradigmatic human event," a kind of demonstration of what would happen if life operated outside of social constraints (Geertz 1972: 28). Geertz' work proved to be influential in subsequent research on play (Abramson and Fletcher 2007; Ancelet 2001; Niehaus and Stadler 2004), even outside of anthropology (e.g., Pesic 2001–02).

Around the same time, some play researchers changed their focus from determining how play functions in society to a more experiential paradigm. Csikszentmihalyi and Bennet (1971) suggest that play is a way for humans to deal with their existence; playing helps people to change their experience as a reaction against the worries of social order and boredom. Building on this hypothesis, Csikszentmihalyi interviewed people who participated in activities that appear to have some kind of intrinsic benefit, rather than a material one (what he calls "autotelic activities"), of which play activities were a part (Csikszentmihalyi 1975(2000): 21). He found that the respondents were nearly unanimous in their assertions that they "devoted time and effort to their activity because they gained a peculiar state of experience from it, an experience that is not accessible in 'everyday life'" (Csikszentmihalyi 1975(2000): 35). He refers to this complex, dynamic state of mind as "flow." Flow activities, those types of action that more readily produce this state, include play (and particularly games), of which chess, basketball, and rock climbing were the focus of his study (Csikszentmihalyi 1975(2000): 36–7). Furthermore, he observed that flow could also be experienced during activities usually identified as work, identifying the "Protestant work ethic" as a flow activity (Csikszentmihalyi 1975(2000): 187).

Stevens (1980) was the first anthropologist to build on the idea of flow and conclude that the dichotomy of work versus play is false. He argued that play researchers have been confusing play with the experience of it (Stevens 1980: 322). This experience can be produced either through "play" or "work," and, therefore, it is possible that dichotomizing them occludes what really is occurring. Indeed, the separation of work and play has been demonstrated to be a somewhat recent one in American society (Cross 2008). It has further been shown that this dichotomy is not culturally universal. The Kpelle of West Africa do not separate the two, and without play (*lii-nee'*, better translated as "joy") there can be no work, and it must be part of the work activity itself (Lancy 1980: 326). While the conceptualization of what play is within society may have important implications relating to the social realities in which it exists (Cross 2008), "it is playfulness that counts, not play itself" (Csiksentmihalyi 1976: 9).

Building from the breakdown of this conceptual dichotomy, Blanchard (1995: 45–6) proposed a two-way matrix on which any kind of human activity can be placed (Fig. I.2). This is achieved by defining an axis of actions with external goals (i.e., work-like) and those without external goals (non-work or leisure). Intersecting this axis is another representing a spectrum of the pleasure achieved from the actions, specifying a continuum between pleasurable "play" and unpleasurable "not-play." It is a far more experiential approach than those taken previously and places play and work not as opposites, but as two separate components that exist together to various degrees throughout every kind of human action. The quadrants that this scheme produces — playful work in quadrant A, playful leisure in quadrant B, unplayful work in quadrant C,

and unpleasurable non-work activity in quadrant D (Blanchard 1995: 45–50)— allow for a more nuanced understanding of activities including both play and work.

Blanchard, nevertheless, remained concerned with social evolutionary approaches to games and argued that, while a particular game may exist in two cultures, the level of competitiveness, structure, and complexity of the game itself may differ between these cultures (Blanchard and Cheska 1985: 125–97). Based on a modified version of Service's (1968) band-tribe-chiefdom-state cultural evolutionary scheme, he identified cultures that fit into these categories, discussed their games, and made conclusions based on the sports that have been described in those cultures. This methodology is problematic in similar ways to Roberts *et al.,* in that it draws from a small sample of societies and games to arrive at his conclusions . Furthermore, Service's schema has fallen out of fashion in anthropological archaeology, which has moved away from the earlier practice of attempting to fit societies into one of these categories which are often too rigid and arbitrary to accurately describe particular cultures (Kristiansen 2010; Yoffee 2005).

In his work outlining the different approaches researchers in a variety of disciplines have taken in the research of play, Sutton-Smith (1997: 221–31) offered a new approach to play in which it is an adaptive mechanism allowing for variation in human social activity. He places variability as the feature of primary importance of play to introduce social relations and cultural forms that are outside what is normally allowed (Sutton-Smith 1997: 231). Indeed, play is a "fortification against the disabilities of life" that "lets us exercise physical or mental or social adaptations that translate—directly or indirectly— into ordinary life adjustment" (Sutton-Smith 2008: 116). Examinations of play are increasingly addressed in terms of adaptability (Gray 2009), evolutionary

processes (de Voogt *et al.* 2013), and the construction of social realities (Jonsson 2001). The adaptability afforded by play, through the introduction of a repertoire of behavioral variations (Sutton-Smith 1997: 231), can allow for social change and the negotiating of identity in evolving social realities (Appadurai 1995; Jonsson 2001; 2003; 2010; Kummels 2001; Stoddart 1988). This can and will be discussed in greater detail in Chapter III, as they relate to social complexity.

Summary: Research on play, like any subject of anthropological inquiry, has undergone many changes in approach and conceptualization. Many of these strategies of understanding play have fallen out of favor, but there are similarities and useful concepts from them that are still applicable. While early diffusionist views on the spread of games were overstated, it is clear that games do cross cultural boundaries somewhat readily, as games, such as chess and soccer, have spread throughout the world. Play theorists agree that play itself involves a certain state of being, an experience that, as will be discussed in-depth in Chapter III, allows for different ways of interacting that are often proscribed by cultural expectations. It is this aspect of play that is most important to the research presented here. The present study seeks not to determine how play fits in with human existence in a general way or necessarily to determine its relationship with non-play activities. Rather, it seeks to build on the assertions that play can effect change—as well as be affected by changes—in society by creating variation in possible human action. This variation is crucial in the face of rigidification of cultural institutions, and can lead to adaptive strategies with regard to one's relationship to other individuals or groups. While play itself may be difficult to conceptualize and define, and disagreements exist as

to what it actually is and how it relates to everyday experience, it is important to identify what those disagreements are and recognize them when attempting to engage in play research, particularly in archaeology where play has not received the same degree of theoretically informed attention.

2. Games

For the archaeologist, research on play must address obvious forms of play, for instance those falling in quadrant B (Fig. I.2) in Blanchard's scheme (playful leisure). For those focusing on prehistory, research is limited to material culture, and it is extraordinarily difficult to see flow or playful attitudes in the range of human activity if they do not express themselves materially. Thus, archaeology is restricted in the sense that it can only explore play when it appears with material correlates, which is most commonly found as artifacts specifically designed to be used in play. Playful attitudes during work or other activities, while they are likely to have been experienced by humans in the past, often are not expressed materially and so are not accessible to scholars.

Games are a type of activity closely related to play that allow for the archaeological investigation of play. Games have received much of the attention of play researchers, as they are easily identifiable as a form of play. This is particularly true in archaeology, where more ephemeral forms of play that do not leave material remains are missing from the archaeological record. Games, including sports and board games, have been recognized as a part of ancient society since before archaeology became a formal discipline. This is due to the remains that they have left behind that are blatantly analogous to well-known Western types of play. From stadia, amphitheaters, and balls to

game boards and dice, which appear physically and as depictions in ancient art, games have long been recognized as the most visible kind of play remaining from ancient societies.

Differentiating games from other types of play has proven to be a surprisingly difficult task. Huizinga (1950) and Caillois (1960(2001)) seem to take them for granted and use the term interchangeably with play. Anthropologists historically have taken the term "game" to essentially describe a specific manifestation of play and have worried themselves with categorizing the forms of games that appear rather than addressing the issue of what constitutes a game. The work of Malaby (2007; 2009) is different, since he takes the concept of a game and places it within more recent theoretical definitions of play, i.e., that play is experience more than anything else and is not always separable from non-play. He defines the term game as "a semibounded and socially legitimate domain of contrived contingency that generates interpretable outcomes" (Malaby 2007: 96). Games are semibounded because, while they are somewhat separate from other activity, their consequences may have real effects on other aspects of the players' and, indeed, others' lives (Malaby 2007: 107). They are further "socially legitimate" because the consequences of the course and result of the games are recognized as real, as shown in an extreme case by the attempts of Nazi Germany to use the Berlin Olympic Games to further their ideals (Malaby 2009: 213–4), but realized on a more quotidian level in the development of trust and belonging (Malaby 2007: 109). The outcomes are, then, interpretable based on the cultural consequences of the game and directly related to its legitimacy.

The main part of this definition as described by Malaby is the idea of contingency. He defines it as "that which could have been otherwise," and games contrive a state in which outcomes, which may not otherwise be possible, can be realized (Malaby 2007: 107). Huizinga (1950) and Caillois (1960(2001)) also recognized this state of disorder in games (discussed further in Chapter III). Contingency comes in different forms and can be created in different ways. Stochastic or pure contingency (MacIntyre 1984: 99–100; Malaby 2007: 107) is created by a randomization agent, such as the use of dice or the shuffling of cards to introduce an element of chance to a game. Social contingency (MacIntyre 1984: 97–9; Malaby 2007: 108) is the inability to predict the opponents' actions. Performative contingency (Malaby 2007: 108) is the possibility that a player will succeed or fail in attempting their actions in the course of play, for example, whether a shot made in a basketball game will go through the hoop. Finally, semiotic contingency is "the unpredictability of meaning that always accompanies attempts to interpret the games' outcomes," as he recounts that his increasing skill in *tavli* (Greek backgammon) was met with interpretations ranging from "You've become Greek now!" to "The clever American must have found a new way to cheat" (Malaby 2007: 108). Semiotic contingency is perhaps best demonstrated in the hours of American sports broadcasting, providing analysis of games and what their outcomes mean for teams/players/owners/fans.

An important part of contingency is that it also exists in other kinds of human activity, including work. Because of this, "it places game contexts and other arenas of human experience ontologically on a par with one another" (Malaby 2007: 109). This further reinforces the idea that work and play exist along a continuum. Therefore,

conclusions made about games, particularly how people enact agency and mitigate contingency in their favor to create, maintain, and build identities, have parallels in the ways they deal with contingency in other aspects of life in which unknown outcomes are the reality.

Another perspective Malaby takes toward games that is different from earlier theorists is that games are an ongoing process. A game "always contains the potential for generating new practices and new meanings, possibly refiguring the game itself" (Malaby 2007: 102). Using examples from sports, which have changed rules through time as players use the rules to take advantage of unintended consequences brought about by existing rules, he shows that games are "always in the process of becoming," and that "any given singular moment in any given game may generate new practices or new meanings" (Malaby 2007: 103). Analogy with evolutionary models, moving away from the formalization of species and instead conceptualizing them as groups with a range of shared characteristics, (Malaby 2007: 104) helps to place the practice of games in an evolutionary model, whereby they are continually reproduced, but with variation. Games are repeatedly reproduced each time they are played in the same way that species reproduce. Each proess produces variation in the process of reproduction, and it is important to conceptualize them in this way rather than as a rigid category with certain forms and rules.

Because of the material constraints of archaeological research, the types of games that are available for analysis are limited. In general, sports and board games provide the bulk of the evidence for play in the past, since they often require a material component that other forms of play do not incorporate. Sporting events have been examined

archaeologically, particularly where there are architectural and textual sources, as in the case of the Mesoamerican ball game (Blomster 2012; Fox 1996; Hill and Clark 2001; Whalen and Minnis 1996; Scarborough and Wilcox 1991) and ancient Panhellenic Games (Brown 2003; Kyriazis and Economou 2013; Renfrew 1988). They have been particularly discussed in reference to how large sporting events build identities as well as to how they create and reify hierarchies. This is typically achieved through the truggle introduced by these contests between different consituent groups, which are often tied to particular identities, which then have social consequences based on the result of the game. Far less work has been done on everyday sport, as evidence of this kind is less visible archaeologically.

Board games provide a different level of understanding the social consequences of games. Because they are played on a more intimate scale than a sporting event, the social interactions that make up the game and its performance are on a smaller scale but, nevertheless, have social import. While sporting events may often involve whole communities (including spectators), the playing of board games, in many cases, can involve as few as two people. Because of the evidence available archaeologically, sporting events can often provide large-scale views of how communities engage with identity and power structures, while board games may offer more of a bottom-up view of the ways these processes work on an interpersonal level. Furthermore, while sporting events were periodic occasions that could enact these processes effectively in a more obvious manner, everyday gaming—the archaeological examination of which is possible for board games but not for sports—engages with these processes continually and may produce cumulative social change more subtly, but effectively..

Necessarily, archaeology draws from ethnography to make arguments about past societies, yet not much ethnographic research has focused on board games. Sports, festivals and other playful actions have received the majority of attention (Appadurai 1995; Azoy 2003; Jonsson 2001; 2003; 2010), and discussions of board games are often cursory. Much of the work has focused on various forms of mancala games throughout Africa and Asia (Townshend 1979a; 1979b; 1980; 1982; 1986; 2007; de Voogt 1997; 2005; Walker 1991; 2007). Townshend's work focused broadly on looking at the distribution of mancala games in Africa, addressing the assertions of Roberts *et al.* (1959) that certain types of games could be associated with different levels of social complexity. He found these assertions to be unsupported by the evidence in African societies, and in doing so, accumulated a lot of ethnographic data on how games were played and by whom, and addressed the relationship of games to other kinds of social processes for certain examples. For instance, he described how the game of *bao*, played in East Africa, helps to reconcile social difference:

> …within the meta-reality of the game the poor man can denude the rich of his wealth, the humble wrest power and prestige from the exalted, secure in a haven of equal rights and just deserts from the grim realities of abuse outside. The social trappings of the real world are suspended for its duration; thus all submit rigorously to the same rules, confident in the justice of the result. (Townshend 1986: 195)

Townshend is effectively talking about the liminoid qualities of *bao*, a state common to games that will be discussed in further detail in Chapter III.

Townshend is primarily concerned with the distribution of different mancala types and how they spread among cultures in different parts of Africa, touching on ideas suggesting that games can be strong signals of identity, and even if the rules and gaming paraphernalia are the same, the performance of the play can be strongly tied to group

identity. He demonstrates this by discussing the Pokomo and Orma people of Kenya, who play a mancala game they call *mbothe* and *lami*, respectively. The rules of the game are the same, but the Pokomo prefer to play quickly and individualistically, while the Orma often play in groups (Townshend 2007: 246). In other cases, the rules themselves can be strong indicators of identity, as is seen on Barbados, where *warri* (another mancala game) is played differently in Speightstown than it is in Bridgetown (de Voogt 2005: 190–2). Townshend (2007: 249) lays out three "forces that attract or repel mancala." They are the articulation of ethnic solidarity or distinction, expression of cultural emulation or contempt, and the preservation or subversion of traditional values. These "forces" conflate a number of different social processes, such as identity formation, liminality, and contingency, among others, but they indicate that these processes are important considerations for the social effects of gaming. His statement that "it is not a game, but a vastly complex medium that allows almost endless variations on a basic theme, and…leaves itself open to re-interpretation at the whim of its new owners" (Townshend 2007: 249) anticipates both Malaby's assertion of games as process and de Voogt e*t al.*'s (2013, see below) findings on cultural transmission of games.

Another important ethnographic discussion of board games comes from Malaby (2003), whose primary focus was gambling in the city of Chania on Crete. While the majority of his focus is on games easily recognized as gambling, such as poker and various dice games, he includes *tavli*, Greek backgammon, in his analysis. *Tavli*, he argues, is just as much a form of gambling, even though material possessions or money are not typically wagered as in poker or dice games, because "individual status is so vividly at stake in any given game" (Malaby 2003: 59). This ethnographic work is what

led to his discussion of contingency as a crucial feature of games. He notes that *tavli* is about construction of social identities and building relationships. The visibility of the game, which is typically played at *kafeneia*, coffee houses, throughout the city (and, indeed, the Greek world, including Cyprus), leads to them becoming "fodder for local struggles over varied elements of Chaniot identity" (Malaby 2003: 52). The game is risky "because players are exposed to unknown but potentially damaging public appraisal," since *tavli* games often are observed by a group of spectators (Malaby 2003: 66). It is the most publicly played of the games Malaby studies, and, because part of the performance of the game involves the mobilization of sound to convey status—whereby winning players play more loudly and through clever gestures and vocalizations portray chance outcomes as their own skill—becomes "the most evident marker of hierarchy" (Malaby 2003: 59–62). This type of action is more frequently used when the players are not well known to one another and rarely employed when familiar opponents engage in *tavli*. Chaniots equate the playing of *tavli* between unfamiliar opponents to the *proxenio*, the first meeting between families of arranged marriages, where extensive scrutiny is placed on the bride and groom, searching out their behavior in pubic view (Malaby 2003: 74). Players attempt to gauge their opponents' ability to overcome distraction and spectators of the game may also engage in this activity (Malaby 2003: 71), with "biting penalties from strangers and acquaintances for inept social performance" (Malaby 2003: 62), as the skill to distract and remain focused are "strongly related to the concept of Cretan maleness" (Malaby 2003: 60–1) as well as national identity (Malaby 2003: 66). The importance of the performance of *tavli* is reflected materially, as Chaniots prefer wooden boards and pieces of heavy, dense material for the playing pieces to maximize the sound

made by slapping them on the board (Malaby 2003: 65–6). The play of *tavli*, as well as dice and card games in Chania, provide a meta-reality or liminoid space in which "every moment (is) a new chance to account for one's place or that of others" (Malaby 2003: 52).

As already mentioned, board games have been recognized as part of ancient society since before the development of archaeology as a coherent discipline (e.g., Prisse d'Avennes 1847). Early research on ancient games was much in the same vein as Tylor's research, drawing connections between ancient games and modern and attempting to ascertain rules that were often highly speculative (e.g., Becq de Fouquieres 1831; Falkener 1892; Montet 1950). Categorization of board games, similar to attempts at categorizing types of play, was attempted later (Murray 1952; de Voogt 1995), but for the majority of the history of board games research in archaeology, the focus has been on identifying origins, attempting to discern the games' rules, and interpretation of texts discussing games to determine their religious use or attitudes toward certain games. Few of these examinations have engaged the work of play theorists discussed above and, therefore, research on board games, particularly within archaeology, has been stuck in an antiquated mode of inquiry past which cultural anthropology has since moved. Much of the reason for this is the lack of evidence for play, in general, from archaeological contexts. Although there are a number of well-known board games from the ancient world, the numbers of artifacts found from comparable contexts within a culture are often too few to make meaningful conclusions about socially relevant questions. This is particularly true inwhen discussing games, which are so intrinsically subject to culturally determined practices. Compounded with the fact that most of the known boards were

found in the early days of the discipline, before detailed contextual information was documented during excavation, the archaeological study of games has been hindered by a severe lack of data.

Because of the difficulty in identifying game boards and their paraphernalia in prehistoric archaeological contexts without textual sources (as discussed in greater detail in Chapter IV), research on board games in ancient societies has focused on a limited number of games that have been easily identifiable due to their resemblance to modern games that are, in some cases, also well-attested in textual evidence. The most commonly discussed ancient board games are the games of *senet* and *mehen* from Egypt (Kendall 1979; 2007; Montet 1955; Piccione 1990a; 1990b; 2007; Pusch 1979; Ranke 1920; Vandier 1964), twenty squares (or "Royal Game of Ur) and fifty-eight holes (or "hounds and jackals " in Egypt) from the Near East (Carnarvon and Carter 1912; Dunn-Vaturi and Schädler 2006; Finkel 2007; Gadd 1934; Hoerth 1961; 2007; Pusch 2007, Rothöler 1996), *pente grammai* ("five lines") from Greece (Kurke 2002; Schädler 1998; 2008), *ludus latrunculorum* ("game of robbers") and *ludus duodecrim scripta* ("game of twelve signs") from the Roman Empire (Austin 1932; 1935, Krüger 1982; Lamer 1927; Mulvin and Sidebotham 2002; Schädler 1994; 1995; Trifilò 2011) , and *patolli* from Mesoamerica (Bente Bittman and Swezey 1983; Caso 1924–1927; Smith 1977; Wanyerka 1999). While, historically, focus has been on finely made games that were used by the elite, in more recent years research has turned to more crudely manufactured patterns that have been interpreted as games based on their archaeological context and similarity to known examples. These can be individual artifacts (Buchholz 1981; 1982; Sebbane 2001; Shai *et al* 2014; Swiny 1980; 1986) as well as graffiti on existing

monuments (Bell 2007; de Voogt 2010; 2012, Hillbom 2011; Jacquet-Gordon 2003; Roueché 2007; Voorhies 2013).

While these games have provided the bulk of archaeological evidence on gaming from the ancient world, there remains considerable work to be done in documenting them in a way that is up to modern standards of archaeological methodology. The presence of some of these games remains anecdotal; the appearance of a particular game may be noted as graffiti on a pavement at a certain monument, but its specific location and form may not be recorded. This is particularly true for Greco-Roman and Mesoamerican games. The Egyptian and Near Eastern games appear in the greatest numbers and are in some ways the best-attested board games archaeologically, but they can only be partially interpreted because they are usually of types and materials used by elites, and were found in the early days of archaeology, and, thus, there is often little to no contextual information from which to make broader conclusions. Therefore, questions are somewhat limited by the kinds of information that is available to researchers. The low level of theoretical discussion of games, a consequence of the lack of contextual information, then makes the topic a challenging one for researchers. Without a coherent body of literature discussing board games in a way that discusses them in reference to social processes, rather than as an artifact type with some novelty interest, there has been little progress on the archaeological study of ancient games and their relationship to social action. Coupled with Western bias against play that favors "work" as a valued subject of inquiry, these factors have placed the state of research on games and play in the ancient world in need of great innovation.

In part, the unavailability of theoretically informed archaeological work on board games is a reflection of the relative lack of ethnographic work on board games from which to draw comparisons. Until the late 1970s, board games were often only mentioned cursorily in the literature, mentioning the form a game takes, and perhaps when or where it was played and by whom, but board games themselves have rarely been the focus of ethnography until relatively recently. Despite the attention given to sports and festivals, some of the theoretical considerations for those types of play do not apply to board games, which tend to be played in more intimate settings, with fewer people, and with less pageantry.

Nevertheless, recent research has begun to address board games from archaeological contexts in anthropologically interesting ways. Though Tylor's diffusionist views on games were overstated, it is clear that games did spread from one region to another through different kinds of mechanisms. Addressing this issue through the lens of cultural transmission theory, it was found that the morphology of boards were transmitted through time and space with high fidelity, though when the games cross socio-cultural boundaries, more innovations are apparent as people "reinterpret (i.e., translate) rules or other parts of the game from their own local and cultural perspectives" (de Voogt *et al.* 2013: 1728). This research is very much in line with Malaby's (2007) ideas about games as process, as continually reproduced but capable of change, but contradict Townshend's assertion that in their transmission, only component traits can be adopted and reintegrated into new games entirely (Townshend 2007: 249). Townshend's assumptions about the dissemination of games are based on their current distribution and hold little time depth, so it is very possible that the equifinality of the processes of interaction that caused

mancala games to spread through Africa clouds analysis of the interaction by only examining their end (current) state. Research on the appearance of games in pre-Roman and Roman Britain (Hill and Forsyth 2011) as well as the dispersion of games during the Eastern Mediterranean Bronze Age (Bieliński and Taracha 1992), brings together further archaeological evidence for social processes such as trade and emulation that lead to the transmission of games between cultures.

Other research has focused on the sociability of games, as board games typically require more than one person to be played. Rogersdotter (2011), in analyzing the patterning of gaming material found at Mohenjo-daro in the Indus Valley, makes claims that lay the foundation for archaeological research on gaming with relation to social change. Changes in the patterning and type of gaming paraphernalia through time suggested changes in gaming practice with reference to social upheavals (Rogersdotter 2011: 354). Heavily influenced by Csikszenmihalyi's ideas on flow, she argues that games are "operating systems" that create separate, momentary worlds in which a player "forms oneself" in social liaisons that never can be totally closed (Rogersdotter 2011: 341–4). Archaeologically, gaming paraphernalia (cones for "skittles" type games, "gamesmen," and casting sticks) were found in clusters within neighborhoods at Mohenjo-daro. It was found that, while they appeared to be scattered evenly at the site level, when looking at individual neighborhoods, they were not only clustered by type, (Rogersdotter 2011: 179–82), but also showed preference for certain types of spaces, with a preference for streets, wells, and large rooms (Rogersdotter 2011: 190, 219–20), though sometimes the clusters that were identified include artifacts that were found on opposite side of walls and, thus, likely represent different archaeological contexts rather than a

coherent cluster of activity. These clusters were described as having a "border-crossing" character because they appear at the edges of blocks and neighborhoods (Rogersdotter 2011: 352). Despite this, there is a conceptual problem with the construction of these "clusters," which seem to span different archaeological contexts and, thus, are not interpretable as coherent spaces in which games were played. Correspondence of gaming materials with artifacts, such as certain clusters with considerable numbers of beads and bangles, or others with terracotta objects (Rogersdotter 2011: 222–6) is discussed but interpretation of what these associations may mean for archaeological interpretation is lacking. Nevertheless, the importance of identifying spaces in which games are played, as others have attempted more successfully (Carretero Vaquero 1998; Mulvin and Sidebotham 2002), is crucial. Games are often played in contexts alongside social lubricants such as alcohol and other psychoactive substances, thus suggesting that games may have a similar function through the liminoid states or meta-realities they create (Crist *et al.* 2016a; see Chapter III).

Summary: The archaeological study of games is ripe for new perspectives and theoretical applications. Application of ethnographic evidence has been lacking, but recently more rigorous work by cultural anthropologists allows for the comparison of observed human practice to the material evidence of past societies. Archaeologists are increasingly recognizing the presence of non-elite games in the course of survey and excavation, supplying much needed evidence on a part of human behavior that can be fairly elusive for those studying past societies.

While play and games researchers have differed in their approaches and interpretations of the importance, mechanisms, and effects of play in human society, there are a number of commonalities that appear in the literature that point to themes of how researchers can approach play and games. Current thought suggests that the work/play dichotomy is a cultural construction and that these activities exist along a continuum, as the act of play is more a state of mind ("flow") than a discrete action. Play is a social act, involving groups of two or often more and, as such, has social consequences outside of the (semi-) bounded reality of a game. Nevertheless, the act of playing a game provides a meta-reality in which individuals are able to take action for the creation or maintenance of identities. This, in part, comes from the contingency of games, where multiple unknowable outcomes are possible, including real social consequences.

Archaeology can offer insights into how the properties of games react to or cause social change because it allows for the examination of change across considerable time depth. While social change, particularly in the context of games, may be incremental, it may accumulate directionally through time. This type of social change becomes visible through diachronic research methods afforded in archaeological cultures where evidence for games appears alongside social change attested through other lines of evidence. One of the more important processes of social change, which occurred in multiple places at multiple times, was the development of social complexity. During this process of increasing institutionalization of status differences, many of the phenomena associated with games, such as identity creation and maintenance as well as prestige building and signaling, are mobilized by individuals or elite groups to legitimize their status. It is

likely that as the distinction between elites and non-elites emerged through time, changes in the ways game were played, which then affected the ways identity and status would be mobilized through them, may be seen.

Chapter III: Sociality of Games

1. Human Sociality

To address the relationship between games and social complexity in the ancient world, one must first situate gaming in a theoretical framework that addresses its relationship to human sociability, because social complexity is, at its core, a process that changes the ways in which people can interact with one another. The interactive nature of games is often taken for granted in theoretical approaches to gaming, which may focus on the educational, ritual, and political aspects of gaming (Sutton-Smith 1997 discusses many approaches in detail). While play, in general, can be an individual endeavor, games, which are "cultural formats that help people interact in defined ways" (Henricks 2008: 162–3), of which board games are a part, are necessarily social activities (Caillois 1961 (2001): 37–41). Because two or more people are required to play them, interaction is necessary to play a game. In this chapter, the consequences gaming has for human social interaction are explored through the lens of liminality and are compared to other social practices that share similar social effects.

The work of Tomasello, Enfield, and others has shown that humans are a uniquely interactive species. The play of games as a social action is contingent on the ways in which humans interact, and, indeed, some of the research on human sociality provides insight into the role games can play in facilitating interaction when humans' natural social tendency is impeded. Tomasello, in particular, has offered research on the natural sociability of humans. In his experiments on young chimpanzees and humans, he has shown that humans are uniquely capable from a young age to interact with one another, as shown by the ability to share attention with others through the act of pointing, an

ability that other apes do not seem to possess (Tomasello 2006). The pointing of infants is a simple form of joint attention (Tomasello 2006: 507–9), where "two or more people simultaneously attend to a single external stimulus, together, each conscious that the experience is shared" (Enfield 2013: 189). From joint attention comes joint intentionality, actions "within which each participant had an individual role and individual perspective" (Tomasello 2014: 35). Joint goals are shared, and the "dual-level structure of sharedness and individuality" (Tomasello 2014: 43) creates a uniquely human form of interaction. As a foundation of cooperative group action, joint intentionality is a form of cooperative communication that formed the foundation for cultural norms and institutions (Tomasello 2014: 48–9). This was brought about through the agreement on appropriate behaviors to achieve success as a group (Tomasello 2009: 86–100).

On a cognitive level, joint attention and intentionality help to construct what is referred to in the literature on human sociality as "common ground" (Moore and Dunham 1995; Tomasello 1999). As the "open stockpile of shared presumption that fuels amplicative inference in communication" (Enfield 2006: 399), common ground allows for easier interaction between individuals, since once they share common ground, they have to expend less effort to satisfy the goals of joint intentionality (Enfield 2013: 188). "Grounding," the process of building common ground between one or more individuals, has consequences for any future interaction, since common ground not only occurs in the experience of joint attention, but also exists in the memory of it (Enfield 2006: 401). In this way, a connection is built between people that is shared not only in the moment of joint attention but also through time, where the initial grounding creates a relationship and the memory of that event maintains it.

While these cognitive aspects of human uniqueness helped early humans (and perhaps human ancestors) to succeed in competing for food (Tomasello 2009), societal changes with the beginnings of agriculture and the appearance of social inequality brought new challenges to the ways in which people were able—or allowed—to interact. Regardless of the debate of whether egalitarianism was our default form of organization or a strategy to subdue inherently competitive human nature (Ames 2007; 2010), researchers attribute egalitarianism to inherent human cognitive abilities (Boehm 2000; Gintis *et al.* 2003; Richerson and Boyd 1998).

With the adoption of agricultural production, population increase brought about new social arrangements and barriers to familiarity among members of a group, as cooperation became more difficult with increasing group size (Boyd and Richerson 1985; Richerson *et al* 2003). This increased complexity of social interaction, while still based on the fundamentals of joint attention, intentionality, and common ground (Tomasello 2009: 103), decreased the amount of common ground shared between members of the same society, as population numbers precluded interpersonal interactions between individuals. While discussion of the origins of social inequality are outside the scope of this study, it is important to note that any questions regarding increasing complexity and, inherently, social inequality are "intricately bound up with questions concerning human cooperation, leadership, and social differentiation both vertical (hierarchical) and horizontal" (Price and Feinman 2010: 2). In attempting to see evidence for types of cooperation and in analyzing the scenarios, tools, and places in which people were building common ground through joint attention and joint intentionality, it may be

possible to see how people were effecting, resisting, and adapting to societal changes through time.

Play and Sociality: The play of games fits into this framework of human cooperation and interaction because the play of games is itself a cooperative endeavor. Tomasello recognizes that "the origins of play are inherently social," and that even in young children, the assigned roles taken in play activity carry normative force (Tomasello 2009: 97). Play is not exclusive to humans, as it exists elsewhere in the animal kingdom, but the unique cognitive abilities that humans exhibit enhance play by adding complexity and higher meaning to it. Huizinga (1950: 1–3) struggles with the origins of play, finding little explanation in biology for the "fun" of playing. His discussion of the "gambler losing himself in his passion" and the "huge crowd roused to frenzy by a football match" (Huizinga 1950: 2) may be given new light in the framework of joint attention and intentionality, since the "fun" of play may lie in the perceived achievement of the shared goals of the joint intentionality of play. It is possible that this fulfillment of human cooperative needs on a joint cognitive level leads to the intensity and absorption of play that Huizinga argues is "the very essence, the primordial quality of play" (Huizinga 1950: 3).

Caillois says that play must be entered into voluntarily and that being forced to play makes it "constraint, drudgery from which one would strive to be freed (Caillois 1961 (2001): 6). This highlights the need for joint intentionality for a game to be successful for both parties: while a game in which one or more of people are coerced into play, they may share joint attention while the joint intentionality is lacking. Thus, the

activity talking place exists somewhere else on Blanchard's schema of the different types of human activity (fig. I.2). This means that play that is pleasureful and that which is not can both exist within a game depending on the participant. Indeed, a game can have an element of play for one participant but not for others (Blanchard 1995: 49–50); but, regardless of the individual's enjoyment of the activity, the performance of it still has social consequences. In any case, Caillois asserts that play "presupposes not solitude but company" (Caillois 1961 (2001): 40), and, with the argument that shared goals are crucial to the success of play in such company, further points to the cooperative nature of play and, by extension, games.

Following Huizinga (1950: 47), along with the cooperation involved in games is a sense of tension and uncertainty among players. This is particularly true of games, which can be classified more generally with sports as contests, or *agôn* according to Caillois (1961 (2001): 14–7). For Huizinga, this type is the most important form of human play, even suggesting that contests are a "civilizing" factor in human society, and the tensions and atmosphere that they create, which can, indeed, threaten to tear apart the act of play itself (Huizinga 1950: 47–8), provide an important balance between the cooperative nature of play and the competitive nature of a contest. Building on this concept is Malaby's (2007; 2009) discussion of contingency in play, which recognizes the uncertainty that underlies the play of games and asserts that it is, in fact, the defining aspect of games. Contingency has many different forms, the most important for this discussion being "semiotic contingency," which refers to the unknowable meaning that can be derived from the interpretations of the game by players and/or spectators (Malaby

2007: 108). The performance of games can have important social implications that can be so extreme as to "cost men their reputations and even their lives" (Herzfeld 1985: 157).

All games, subsumed under the properties discussed above for play, are, in part, determined by the number of people sharing in the experience of joint attention/intentionality. Typically, team sports consist of groups of many people playing, frequently accompanied by a larger event that can incorporate many thousands of spectators. Both the players and the spectators in these events are engaged in joint intentionality, and on this large scale, these types of cooperation can reinforce, challenge, or create identities and power structures (Fox 1996; Renfrew 1988; Sutton-Smith 1997: 74–110; Whalen and Minnis 1996). For instance, the Mesoamerican ballgame, through the gathering of groups of spectators from different groups (based on kinship or residence in specific towns) helped to develop strong group identities through support of competition. The results of these contests then were reified in the social sphere, which augmented ongoing changes in power structures (Hill and Clark 2001). For other forms of play, the effects of cooperation are more difficult to see when there are fewer individuals involved in the interaction. Board games traditionally are the most intimate forms of play, as they are almost exclusively played by only two people, though groups of spectators are not uncommonly attested ethnographically. It is a form of play requiring the most contact between the players, generally within a small space. While sporting events and other contests that involve groups of people have wider-reaching, more readily apparent societal functions on the community level, contests, such as board games or card games, have an effect on the individual level of interaction in the construction and maintenance of interpersonal bonds and power relations that underlie, fuel, and

sometimes counteract structures of power and identity. In the example cited by Davies (1925: 137), board games served to bring Sudanese Arabs and Englishmen into closer relationships that helped to undermine the preexisting relationship of conquerer and conquered. Indeed, these interpersonal bonds may be more effectively built on a lower-level scale of play, since larger examples of sporting events may not require the interaction of certain individuals during the course of play. Though the common ground built through this shared experience may still exist by the virtue of the memory of the event for both/all players, the interpersonal bond is not as strong as it would be for those playing in a more intimate setting. Essentially, the semiotic contingency for sports or festivals may have high stakes for the larger community, but board or card games have social consequences that are strong on the individual level that are cumulative. That is not to say that the play of board games does not carry social import within the larger community, as spectators do often accompany the play of board games. In these situations, the increased number of people partaking in the experience allows for wider social implications for the performance of play.

The nature of play as "outside 'ordinary' life" and exhibiting the "stepping out of common reality" that is apparent in both animal and human play (Huizinga 1950: 13−4) allows for social interactions that affect power and identity. Sutton-Smith (1997) argues for the variability of play as its most fundamental and important feature. In his argument, play provides a suite of available alternatives to behavior, providing variability for future social change (Sutton-Smith 1997: 229–31). While this hypothesis has not been tested as extensively as Tomasello's discussions of joint attention and intentionality, it is not difficult to imagine this aspect of play as part of the evolutionary advantage of human

cooperation. It allows for variability in human action even when behavior is restricted by cultural norms, providing further evolutionary advantages on top of the ability to cooperate (Sutton-Smith 1997: 221–5). Though the act of play itself may be constricted to certain times, places, or people based on cultural norms, the actions that take place within the limioid space of games (see below) are not as bound by convention. Play thus creates variation and allows people to "exercise physical or mental or social adaptations that translate—directly or indirectly—into ordinary life adjustments" (Sutton-Smith 2008: 116). The idea of games or play as "meta-realities," where the struggles in society are played out in the course of the game (Malaby 2003: 52; Townshend 1986: 195) is closely related to the idea of liminality.

2. Liminality of Games

The above discussion of sociality brings forward important properties of play as a social action relating to its abilities to facilitate interaction among people that have some kind of social boundaries between them. Common ground is relevant as an underlying mechanism, since interaction is easiest among people who share a certain amount of common ground. While they exist more broadly as shared cultural practices (e.g., Enfield 2006: 402–5), grounding processes on a more personal level strengthen relationships through specific interactions with a smaller number of people (Enfield 2006: 412–22). The joint attention and joint intentionality offered by games provide avenues for grounding between individuals. The fundamental property of play as being outside the realm of ordinary life (Huizinga 1950: 9), allowing for alternatives of behavior, may be discussed in a better theoretical light through the lens of liminality and liminoid action.

Following the distinctions made by Victor Turner (1982: 32), "liminoid" is a term describing social practices that "resemble but are not identical with 'liminal.'" Liminoid states may apply to situations in which social lubricants are used. Liminality is a state, common to liminoid and liminal action, whereby people can step outside normal social practices and play with the familiar cultural elements and societal structure (Turner 1982: 27), but which are very much serious acts to reproduce the status quo (Turner 1982: 32). An example of liminal activity is religious ritual (Durkheim 1915; Rappaport 1999), whereby actors behave in a proscribed way that may conflict with normative behavior, but which have a specific intent: they are believed to achieve some real-world result as the work of symbolic action (Turner 1982: 32). This can be seen in the simple act of prayer, where individuals say highly formalized prayers, take a culturally appropriate bodily stance (such as kneeling or prostrating oneself), and perform this action at predetermined times, in an attempt to affect outcomes in the real world. The liminoid is distinguished from the liminal in that more freedom is allowed: it "can be an independent domain of creative activity, not simply a distorted mirror, mask, or cloak for structural activity" (Turner 1982: 33). It is less serious, and actions are not as proscribed. It can "generate and store a plurality of alternative models for living…which are capable of influencing the behavior of those in mainstream social and political roles" (Turner 1982: 33). Thus, these actions do not seek to replicate the status quo through inversion of roles: rather their goal is to offer new possibilities outside of the norm. For example, sports fans may, through the shared experience of watching games and participating in other team-centric events, may interact with one another across preexisting social boundaries because of their newly created shared identity as fans of the same team or sport. Places

where liminoid actions are performed, discussed by van Wolputte as "margins," can be described as "an imaginary borderland where boundaries of inclusion and exclusion can be negotiated" (van Wolputte 2010: 93).

Turner's discussion of liminality and the liminoid ties together Huizinga's discussion of the placement of play outside of ordinary life with that of grounding. The act of play creates a limited space and time in which one is freed—to a certain degree—from the bounds of one's own cultural restrictions and allows for new relationships to be built, i.e., grounding to take place among individuals between whom social boundaries of some sort (socio-economic, kinship, ethnic, linguistic) may exist. These interactions, while building interpersonal relationships, also constitute an important part of identity construction and/or maintenance. As changes occur in the ways social boundaries are constructed, particularly as they proliferate with increasing population, increased intercultural connectivity, and the institutionalization of wealth-based status and power, it is expected that the strategies people use to continue interacting, despite these boundaries, will change. Similarly, certain individuals or groups may use liminoid actions to increase or solidify their standing by altering or elaborating existing practices or by adopting foreign, esoteric ones.

While these theoretical assertions address the phenomenon of play more generally, board games are a special subset of play activities that conform to their assertions. To address board games more closely in the light of liminality and grounding, it is important to discuss other liminoid activities in the ethnographic and archaeological record to derive similarities and comparisons to gaming. Indeed, the spaces under which board games are played frequently overlap with other liminoid activities, where the

games may offer another vector of sociability, particularly drinking. Indeed, Heath notes, "the congenial atmosphere that many people associate with drinking is sometimes enhanced by combining drink with other forms of recreation and enjoyment. Sometimes drinking is an accompaniment to card games, board games, or other such pastimes" (Heath 2000: 130).

During the Warring States and Han periods in China, *liubo* was depicted in reliefs and tomb murals as being played in scenes of drinking and merriment (Mackenzie 2004: 120). Games were also played in teahouses during the Ming Dynasty, in which they were another form of entertainment that was provided in addition to plays and story-telling (Dikötter *et al.* 2004: 31). Scientific and intellectual activity may also be considered liminoid, since it "takes place in 'neutral spaces' or privileged areas – laboratories and studies – set aside from the mainstream of productive or political events" (Turner 1982: 33). It is through such intellectual contexts that chess is believed to have arrived in northwestern Europe, through Spain and/or Italy (Riddler 1995: 103). In the following section, psychoactive substances, which have received a considerable amount of attention in anthropological and archaeological literature in the past few decades, will be highlighted as a liminoid activity with rich documentation from which to draw parallels with the sociality and liminality of gaming practices.

Psychoactive Substances: The properties of alcohol and other psychoactive substances allow for the breakdown of social behavior through the intoxicating state they produce and allowing for interaction that would otherwise not be allowed. Indeed, interaction is often contingent on socially acceptable consumption of alcohol or other psychoactive

substances (Dietler 1990: 361; Dikötter *et al.* 2004: 62). Part of the ability of drinking and psychoactive substances to facilitate these types of interactions is the altered states that they create, which, in effect, are a biochemical way of creating liminoid states. While this altered state is important for interaction, it is the social construction of the consumption of these substances, which often takes place in group settings that allow for grounding processes. As important social institutions through which identities are negotiated and social cohesion is promoted, drinking or other consumptive activities involving psychoactive substances have received particular focus in archaeological and ethnographic literature. Numerous accounts have demonstrated these types of gatherings involving alcohol (Bunimovitz and Greenberg 2004; Dietler 1990: 362; 2006; 2010; Sherratt 1987; van Wolputte 2010), opium (Dikötter *et al.* 2004), *qat* (Weir 1985), tobacco (von Gernet 1995), coca (Hugh-Jones 1995) and betel nuts (Hirsch 1995).

The physiological effects of these substances, no doubt, help to produce liminoid action as inhibitions are degraded, allowing one to interact more easily across social boundaries. In Namibia, van Wolputte describes social drinking spaces as "thresholds" where people can choose their drink and the place in which they consume it, each of which has its own social connotation. Choosing one beer or bar over another reflects one's aspirations, as each beer has its own social value, often with class associations. Furthermore, drinking occasions allow the possibility of negotiating the boundaries between identities (van Wolputte 2010: 93–104). In China, opium houses provided a sanctioned venue for men of all social classes to gather and socialize (Dikötter *et al.* 2004: 62). Qat chewing in Yemen allows for the initiation of social relations between strangers, and social gatherings with people chewing qat allow for strangers to be

absorbed into the community (Weir 1985: 126–7). Hospitality and the reciprocal obligations it often creates are frequently cited as an important mechanism by which drinking alcohol facilitates social interaction (Dietler 1990: 361; Sherratt 1987). Coca consumption in one Andean group is more focused on the exchange of coca between men seated according to status and the opportunity for interaction between them (Hugh-Jones 1995: 51–6).

The sociability of these substances may also be appropriated by individuals of higher status to indicate their difference. This can be signaled either by the material accoutrements of drinking (smoking, chewing) or by the substance consumed. While van Wolputte's discussion of choosing beer as signaling one's aspirations is relevant here, other, stronger taboos may exist, such as among the Luo in Kenya, where hierarchy is conspicuous in the materials one can use to drink at gatherings (Dietler and Herbich 2006). In Austria, drinking schnapps as opposed to *sekt* is a form of signaling that shows one's aspirations to higher social status (Thornton 1987). The adoption of Greek drinking vessels and incorporating them into existing drinking practices signaled status in Iron Age Gaul (Dietler 1990, 2010: 338).

Embodying all of these features on a larger scale is the feasting event, which has been a particular focus of anthropological and archaeological research in recent years (Appadurai 2003: 21–5; Bray 2003: 94; Dietler 1990; 2001; 2006; 2010; Hayden 2001; Mintz and DuBois 2002; Pollack 2003; Spielmann 2002; Rosenswig 2007: 5; Twiss 2008: 436). Dietler summarizes anthropological thinking on feasting, saying, "(feasts) are ritual consumption events in which social relationships are formed and maintained; events that both create and define a sense of community and establish relationships

between individuals, as well as defining boundaries and social categories" (Dietler 2010: 218).

Feasts are, thus, occasions for grounding by bringing together members of a community and sometimes outsiders, and provide a space and time where liminoid activity may occur. The food and drink become the focus of joint attention, while joint intentionality of being seen at and taking part in an important community function (as well as enjoying a meal!) produce an occasion where people can build relationships and common ground through a shared experience. The complex interactions that take place during these events serve to entrench, create, or even subvert existing identities and power relations, depending on the individuals involved and their intentions.

Board Games: While it may be the intoxicating effects of psychoactive substances that enhance interaction across social boundaries, the playing of games also produces an altered state of mind under which similar interaction may be facilitated. Indeed, the description of play as "a metaphoric sphere that can conjoin what is otherwise apart and divide what is otherwise together, and in a malleable way use these pretended identities to create a feeling of belonging" (Sutton-Smith 1997: 93) is describing processes that are very similar to those that take place during social drinking occasions. Sutton-Smith describes a continuum between order and disorder in games (Sutton-Smith 1977), from which new models, symbols, and paradigms arise (Turner 1982: 28). He goes on to describe what he calls the "play-mood", a mental process he conflates with religious ecstasy (Huizinga 1950: 17−27), but which, nonetheless, reflects a liminoid state under which people may interact across social norms.

The inclusion of games alongside occasions of other liminoid activities (as discussed above) suggests they play a complimentary role in gatherings where other liminoid activities are present, and the properties of play discussed by Sutton-Smith, Huizinga, and Caillois further suggest that games also can create liminoid states on their own. Though the presence of games during these events is clear to those who are looking for them, games themselves have not received as much attention in the anthropological literature in this light, though some evidence does exist to support this argument (e.g., Heath 2000: 130; Lhôte 1994: 148; Mackenzie 2004: 120). In discussing a game of chess in Malaysia, Raybeck specifically states that playing with people there "served to improve (his) access to interaction," leading to conversation through the course of the game and even invitations to visit peoples' homes (Raybeck 1996: 61).

Whereas board games have not been a major focus of ethnographic research, they are readily visible in the archaeological record and are perhaps the most accessible form of play that survives from the ancient world. Requiring a material component, board games stand out from other forms of play that require little more than the human body. Though board games are sometimes played in hollows scooped out of the ground or made of perishable materials, they were frequently manufactured from non-perishable materials, whereas balls or sticks commonly used for sports were made almost exclusively of organic materials (leather, wood) that only preserve in extraordinary circumstances. Finally, the widespread occurrence of board games throughout the Old and New Worlds, from antiquity to the present day, provides a rich body of material for cross-cultural comparison, provided it is recognized and discussed in anthropologically interesting ways. Since games in antiquity have rarely received this sort of treatment by

theoretically driven archaeologists, one must turn to the ethnographic record for evidence on how games behave as social lubricants. The liminoid space provided by games and the process of grounding to build relationships allows people to interact with one another, but without physiological changes that drinking brings about.

Townshend (1986) discusses a number of ways in which mancala games in Africa are used in the construction and maintenance of identity and how they relate to power relations. With regard to identity, he describes the Orma in the Horn of Africa emulating Somali games, as the Somali are perceived to have greater prestige, but elder Orma continue the practice of traditional games (292–3). Mancala was used by the Pokomo "to maintain traditional identity in the face of German missionaries" (296). *Kiuthi*, a hybrid game, helped the Mesu people construct and maintain a composite ethnic identity (312). Men with ambition of obtaining prestige can be seen frequenting games with chiefs rather than with other members of society (279). Indeed, among the Ganda, chiefs use the play of mancala as an "opportunity to meet their people socially and to know them personally" (Nsimbi 1968: 3). Townshend suggests that, since in many societies, mancala boards are shared by the community, board ownership, where it exists, "may lead to looser social cohesion" (Townshend 1986: 373). Indeed, he plainly suggests that the play of mancala contributes significantly to one's ethnic identity on the continent (Townshend 1986: 379). These observations, though tangential to Townshend's main argument, provide clues for the roles mancala games play in grounding and the creation of maintenance of identity and status in Africa.

Malaby (2003) discusses the play of *tavli* on Crete, and discusses the ways in which it is used for two acquaintances to get to know one another. While there are social

norms limiting the social distance between two players—it can never be played between complete strangers—it is frequently equated with the first meeting of the parents of an engaged couple, where there is extensive scrutiny placed on the participants (Malaby 2003: 63, 74). Nevertheless, because *tavli* games often include a group of spectators, strangers can be involved in the interactions that occur over the course of the game, which are equally important for the social implications at stake during the performance of the game (Malaby 2003: 62).

Further accounts suggest that, while in the liminoid state of play, board games allow people to interact across kinship, ethnic, and socio-economic boundaries. Indeed, board games can facilitate interaction even across linguistic boundaries, as in Malaysia where the local version of chess is very similar to the Western version of the game, thus, "participation (by Westerners) requires little language skill" (Raybeck 1996: 61). Social boundaries need not be that stark for games to bring people into closer familiarity. It was common among groups in the Horn of Africa (Pankhurst 1971), India, and Sri Lanka (Townshend 1977: 92) for newly married couples to play board games on their wedding night in order to establish familiarity (Finkel 2006: 72). Board games have, likewise, been observed fostering interaction across cultural boundaries. Driberg recounts an instance when two different groups in Equatorial Africa came together for trade, and the playing of the board game *choro* served as a social lubricant, turning animosity into "greatest amity" (Driberg 1927: 168). This may also occur across socio-economic and power lines, as Davies observed that games served to bring the English into contact with Sudanese Arabs "in a capacity other than that of tax-gatherer or punisher of delinquencies and … have a definite administrative value" (Davies 1925: 137). Though these

ethnographic accounts support the argument that games are employed in crossing social boundaries, such descriptions are in passing and uncommon in the literature.

Some work has stressed the use of game boards as markers of elite status and as signals of this status similarly to the consumption of particular alcoholic beverages or the use of specialized or imported vessels in feasting. The use of precious materials, and sometimes restrictions on ownership of game boards, is evident in many societies in Africa that play mancala. An association between elite status and the ownership of games made of certain materials, or made by famous craftsmen, has been demonstrated in some cases (Walker 1991; 2007). Indeed, finely carved game boards were used in elite gift exchange, as demonstrated by the gift of a large wooden game board presented to King George V by King Daudi Chwa of the Buganda (Walker 2007: 255). In Japan, elaborate *sugoroku* (Japanese backgammon), *shogi* (Japanese chess), and *go* sets were part of the bridal trousseaux of aristocratic women. Even though *sugoroku* was no longer widely played, it was still considered essential equipment for a household of status (Masukawa 2004: 109). Despite the fact that these exchanges cross ethnic or kinship boundaries, the literature infrequently discusses how such practices may have helped to spread games from one culture to another.

Murray (2006: 187–93) argues directly that games are joint attentional scenes, the enjoyment of which is "hardwired" into humans evolutionarily, as they help us to accomplish joint intentionality. Building from this argument and from the evidence presented above, it appears that the playing of games can be an avenue for building common ground. Games introduce a different dynamic into liminoid scenarios than exist in drinking occasions. They produce a sort of struggle, which brings a certain level of

tension into the interaction that is taking place, and the result may not always be positive. The unpredictable nature of games—contingency—coupled with their liminoid nature allows not only for different types of interaction among people but also allows for those interactions to affect participants' social realities. Indeed, while the literature mainly speaks about maintaining human sociality and the creation and maintenance of relationships and identities, they may just as much be broken or destroyed and have a negative impact on the sociability of individuals or groups.

Summary and Expectations for Changing Social Boundaries: Human sociability is unique from that of animals in that it allows for a shared intentionality toward a certain goal, most often accomplished through the utilization of the ability for joint attention. This practice provides, both in the act and through the memory of it, common ground through which humans build relationships from which they can then build further interactions. These basic processes of human interaction underlie the formation of identity and can be employed in many different ways. As population grows within a society, social boundaries increase, due to limits on an individual's ability to interact with others within social networks. In some cases, certain kinds of social actions are available to those who wish to interact with others across those boundaries in order to construct common ground with them. Liminoid activities, most prominently in the form of large-scale consumption events involving the use of psychoactive substances, facilitate this sought-after interaction. Play, itself a type of liminoid activity, also allows for this facilitation.

Since consumptive events and gaming can occur alongside each other, and both take place individually and together in clearly defined spaces, it is likely that changes in

the patterning of gaming material can be seen in the archaeological record. When other aspects of material culture suggest that over a certain period of time social relationships within a society changed, it is also expected that practices of gaming may be seen changing in order to accommodate, resist, or exacerbate social changes. Using this framework of understanding the roles of gaming in society, it is then possible to inform archaeological investigation of this topic from a perspective that has not been approached previously. Contingency, when combined with the liminoid properties of games and the process of grounding, introduces variability into the results of the interactions that result from play. The liminoid aspect of games sets up the possibility for people to interact who may not have been allowed to otherwise, grounding allows those people to build relationships, and contingency can cause these relationships to change depending on the results of the game. This kind of interaction, then, may be used in different types of social settings either in reaction to or to cause social change cumulatively through time.

3. Social Complexity and Social Boundaries

The social nature of humans allows for ever-more complex forms of society in which social realities have been created for various reasons that prevent interactions among individuals or groups, and yet complex forms of social organization are built on the fundamental cooperative skills inherent to humans (Tomasello 2009: 103–4). The social, economic, and political inequalities that resulted from increasing population, reliance on agricultural subsistence, and sedentism have been extensively explored in the anthropological and archaeological literature. The multitude of approaches and explanations for the rise of complex societies are outside the scope of this research, but it

is necessary to situate complexity within the above discussion of sociality and liminality to relate how games can affect or be affected by changes in socio-economic inequality. For the purposes of this research, categorization of societies into organizational stages or types is not pursued, as increasingly the debate over whether a particular society should be considered a chiefdom or a state is overly specific and not relevant to this type of research. Instead, the focus of this study is to observe changes in practice alongside emerging complexity, and to determine whether those changes in the practice of play are in reaction to increasing social complexity, or if they are causing it. Increasing wealth and status differentiation is readily apparent in the archaeological record of Bronze Age Cyprus, but this study does not seek to assign certain types of gaming activity to certain types of society, or even to make an argument about whether states or chiefdoms existed on the island. Thus, gaming material is approached from an understanding that the new social boundaries that are coeval with the emergence of socially complex society changed throughout the Bronze Age of Cyprus and games, as liminoid activities providing joint attentional scenes allowing for grounding between individuals from socially separate groups, were used in different ways as demanded by the new social realities, but also in some cases in attempts to subvert new divisions.

Increasing social boundaries in emergent social complexity do not always mean there is institutionalized social inequality (Ames 2010: 16). Rather, recent research suggests that many of the traits that are often associated with complexity (e.g., high population, agricultural subsistence, corporate groups, sedentism, and specialization) do not always infer inequality (Ames 2007; Arnold 1996; Sassaman 2004). Likewise, inequality can exist without the appearance of these other traits (Ames 2010: 17–19;

Sassaman 2004; Saunders 2004). Social inequality does not, therefore, need to exist for social boundaries to exist among individuals or groups, as complexity may be comprised of heterarchical systems that do not always institutionalize unequal social relations (Crumley 1995).

Social boundaries exist not only vertically (i.e., in hierarchical relationships) but also horizontally (Drennan 1996; Feinman 2000), and withing those vertical or horizontal groups internal hierarchies may also exist (McGuire 1983), be situationally hierarchical (Rautman 1998), or have power spread across different but equal social institutions where none has precedence over the others (Crumley 1994a; 1994b; Crumley and Marquardt 1990; Thurston 2010: 204). Drennan *et al.* suggest that vertical and horizontal differentiation are entirely different from one another and argue that many different measures of inequality exist along multiple axes of variability (2010: 70–3).

Increasingly popular among archaeologists studying complexity are social network approaches, which "study the emergent properties of webs of relationships between nodes that represent individuals or groups" (Pailes 2014: 466). This approach has been applied at both intersite (Feinman *et al.* 2012; Knappett 2011; Mills *et al.* 2013; Swantek 2014) and intrasite levels (Bradley 1993; Shapiro 2005; Wilcox 1999). In essence, these network analyses identify nodes within a region or settlement, whether they are individual settlements, households, or supra-household groups, and measure their connectivity to other nodes. The centrality or connectivity of certain nodes within the network may measure the amount of traffic passing through a node, or the amount of time it takes for goods or information will reach a node, in comparison to others (Borgatti 2005).

Pailes' analysis (2014) found that centrality of nodes was often associated with inequality (i.e., nodes with high centrality values also were associated with measures of inequality such as residence size) in his assessment of the Early Classic Hohokam site of Cerro Prieto. As an example of intrasite network analysis, it is useful in helping to conceptualize social boundaries in a site demonstrating aspects of complexity, but which do not convey obvious social inequality. In assessing the network of house clusters at Cerro Prieto, it can be argued that house clusters more closely connected to one another were more socially connected than distant house clusters many nodes away. The high connectivity of some house clusters may indicate, on one hand, fewer social boundaries with the nodes to which they were connected. On the other hand, the social inequality that is apparent in the material of the highly connected house clusters may suggest that other social boundaries may have existed between members of the groups living in these nodes and those living in less-connected house clusters. This method highlights one of the ways in which complexity is manifested in the material record, and is helpful in conceptualizing complexity for the purposes of this study, which looks at spaces of gaming on Bronze Age Cyprus. With the increase of social complexity seen through the Bronze Age on Cyprus, changes in the organization of space can be seen as changes in the way architcture is used to mitigate or reinforce new social boundaries. While the nature of the archaeological sites on the island does not permit this kind of analysis, due to relatively small areas of archaeological exposure at individual sites, other indications relating to whether spaces were communal or restricted are possible to assess, as Fisher (2006; 2007; 2009) has done. It may then be possible to make inferences relating to

games found in communal versus restricted spaces and thence to draw conclusions on the ways games were employed socially in those spaces.

Social networks, hierarchies, and different forms of horizontal differentiation all provide simultaneous ways in which social boundaries are created, maintained, and institutionalized. The mosaic of social systems existing in a particular society can be a palimpsest for determining relationships between individuals and/or groups. Using material culture, in particular, can prove to be difficult to untangle the many types of social relationships that existed in the past, but the purpose of this research is not to identify what social boundaries are changing through time with increasing complexity. Rather, taking the changes in boundaries in a general sense as a fundamental aspect of increasing complexity, this dissertation seeks to explore the possibility that people adapted to new social realities by seeking new ways in which to create grounding experiences through the use of liminoid activities. This will be acheieved by examining the contexts in which games were played in order to assesss the degree to which grounding or the performance of games are emphasized. From this, is will be inferred whether attempts to manipulate identity through semiotic contingency or develop relationship through grounding were the focus of gaming practice.

The occasions in which grounding happens between people are multitudinous and impossible to document *in toto*, particularly in archaeological contexts. For the most part, the effects of grounding happen on the individual level, and to understand how these processes produce or react to change on a larger scale, it is important to consider theoretical approaches that discuss how the artifacts themselves, as tools of interaction, are used by humans to achieve goals. Because board games are so heavily tied to the use

of artifacts, it is important to understand the entanglements (Hodder 2012) among humans and the artifacts associated with games, to see how they are utilized to effectively harness grounding or contingency. Moreover, understanding of the social biographies (Appadurai 1986) of games helps to understand their use through time, and to further elaborate the kinds of activities in which they were incorporated. These more phenomenological approaches—discussed, for clarity, in greater detail in conjunction with the interpretation of the material corpus—intersect with issues such as identity and materiality and inform the evolutionary approaches that fuel the interpretation of gaming and social complexity. By understanding the act of the game as it played out, and the interpretations that may then have resulted, change through time may then be seen as people change their actions, or engage with the game in different ways to produce change or react to it.

These approaches allow for the examination of contingency, the liminoid nature of games, and grounding, as these aspects of games act on the individual level in a cumulative way to produce archaeologically visible patterns. The liminoid property of games provides a setting in which people can interact with each other while ignoring existing social rules. This allows for people to act more freely, and to create new possibilities for building social relationships with one another. Grounding provides a process by which people can then build these relationships. Contingency introduces uncertainty, which creates further possibilities for the overturning of hierarchical relationships, in a way democratizing the ability to gain prestige through the game. This, of course, can be done through the performance of the game, which is acceptable due to the limioid nature of the game. Because of these properties of games, there are certain

social processes that are relevant both to gaming and to social complexity. To focus this research, four changing processes have been identified that share importance for changing social complexity and gaming: organization of space, feasting, intra-island interaction, and foreign interaction.

The organization of space is relevant to gaming as games are often proscribed from certain places. Considerable changes in the organization of space, particularly in the layout of houses and the development of restricted spaces, have been observed with increasing complexity (Fisher 2006; 2007; 2009; Kent 1990; Steadman 1990; 2000), but it is less explicitly treated in the literature relating to games and play. Judging from a sampling of the ethnographic evidence that mentions the places in which games were played, the meaning of a game itself can be changed based on the space in which it was played. An example can be seen in the mancala game of *adji-boto* as played by the Saramacca people of Suriname. It was observed that, when played in the "House of the Dead," certain styles of play were favored in order to amuse the spirit of the departed (Herskovits 1932: 26). Popova lists a number of places in which mancala was preferably played within settlements in different places throughout Africa: in the village plaza, under a tree, or in the homes of men in Ethiopia, Gabon, and Madagascar; outside the village limits in Uganda and among the Masai. She goes on to note that, in cases where mancala is played as part of religious ritual, such as during the election of a chief, or during initiation rituals for young men or women, games are typically played in a closed space (Popova 1976: 440). Kuschel, speaking about play more generally on the Polynesian island of Bellona, notes that only areas behind households and between the household and the cookhouse were seen as suitable places for play, as it was believed that

playing in most other areas of a settlement would be disturbing to the gods (Kuschel 1975: 28). With the arrival of European colonists, not only the types of games that were played changed (with the introduction of soccer, rugby, and basketball, for instance), but the layout of villages also changed, allowing for larger open spaces within the village, and taboos against play within the village itself were relaxed, though lingering beliefs showed a strong preference for games to be played outside the village whenever possible (Kuschel 1975: 60–1). Other choices for game play are more practical. For instance, the Hadiya of south-central Ethiopia typically played the board game *gamacha* in an elevated location by herders looking out for cattle raiders or under a tree or gateway by elders seeking the availability of shade from the sun (Pankhurst 1971: 183).

Also in south-central Ethiopia, the Konso play *tagéga*, another mancala game, in spaces that they have set aside for large assemblies (Pankhurst 1971: 187). Pankhurst also notes that in western Ethiopia, *sadéqa* and *gabata* were both commonly played in drinking houses (1971: 201). The accompaniment of games with drinking has already been discussed above, so the connection of these two types of liminoid activities is expected. On a larger scale, drinking and feasting events, as mentioned above, are key components of the building and maintenance of identities among societies and also allow for the construction of prestige by those supplying, organizing, or hosting the feast.

Intracultural relations also frequently change with changing social complexity. One of the more prominent concepts of research in complex society has been the examination of settlement hierarchies, which tend to appear as settlements become specialized and power is concentrated in certain places (Crumley 1976; Drennan and Peterson 2004; Johnson 1977; Knapp 1997; Liu 1996; Paynter 1982). This fundamentally

changes the ways in which residents of sites interact with one another, as they become dependent on other settlements for access to resources as specialization increases. As relationships between sites change, variation in the strategies used for grounding by people living in individual settlements may differ between them and settlements in other tiers in the settlement hierarchy. The types of social boundaries that exist among those living in settlements in the same (or adjacent) tiers are expected to be different from those that exist between people in further-removed settlements in a given settlement hierarchy.

Foreign interactions present another occasion in which grounding and liminoid practices may be necessary to cross social boundaries. Contacts with neighboring cultures are not necessarily contingent on the presence of complex society, but increased population and a complex economy often coincide with more connectivity with nearby societies. On Cyrpus, for instance, foreign relations increased dramatically during the latter half of the Bronze Age with the intensification of the copper trade. These intensified interactions, which incorporated Cyprus as an integral part of an interaction sphere spanning the Aegean to Mesopotamia, changed the ways in which Cypriots incorporated foreign objects, motifs, and practices into their own society (as discussed in greater detail in Chapter V).

This research seeks to explore the ways in which Cypriots may have used the play of board games as a liminoid activity to create the grounding experiences necessary to counteract the social boundaries instituted by increasing social complexity. Using the archaeological contexts of these games, it will be determined whether emphasis was placed on building relationships between individuals through the use of grounding, or whether engaging with semiotic contingency and, thus, building prestige was the focus.

These actions may have been tools to subvert divisions and maintain existing identities through the manipulation of contingency as much as they may have been co-opted to enhance and enforce social differences in a way analogous to feasts, which served both to build communal identity and individual status. The possibilities that signaling through the play of particular board games may indicate one's status, and that exclusion of certain segments of the population from playing specific games, whether through exclusion or through acts of resistance, will also be explored. In so doing, changes in the liminoid practice of gaming over a large time scale (roughly 1500 years) will be examined, providing insight on an aspect of everyday life in the past that has been relatively invisible in the archaeological record.

IV. Re-examining and Situating the Cypriot Corpus: Identifying Patterns of Depressions as Games

1. Stones with Depressions on Cyprus

"Gaming stones," as they are now commonly known in the literature, have only been identified on Cyprus in the past forty years. Despite a significant amount of archaeological investigation on the island since the nineteenth century, these artifacts were first noted by the Kent State University Expedition to Episkopi *Phaneromeni* during their excavations in 1975 (Swiny 1976), and similar finds at the concurrent excavations at Kition *Kathari*[1] (Karageorghis 1975, 1976) demonstrated that these peculiar stones with patterns of depressions were not unique to the southwest coast of the island. A wider survey of comparative material from the Episkopi region suggested that these stones were games (Swiny 1980). Their abundance throughout the area was further demonstrated by Swiny (1981) who provided a larger corpus for comparative study. Publication of these artifacts as well as other studies focusing on stones with depressions (Buchholz 1981, 1982) led to their identification at other sites: by 1979, 106 were known from fifteen sites, and by 1985, 194 gaming stones had been found at 33 sites (Swiny 1986a: 32). As of this writing, over 400 games are known from 53 sites, and Swiny's prediction that "Bronze Age settlements without gaming stones will be the exception rather than the rule" (Swiny 1986a: 32) has been proven true, as all major Bronze Age settlement excavations since then have produced gaming stones.

[1] The first mention of stones with depression was in Karageorghis 1975 (875), who mentions "deux pierres comportant des indentations incises, disposées en rangées de dix ou onze, qui pouvaient être des tables à calculer ou des jeux."

It is perhaps not surprising that these artifacts were first identified during the 1970s because they are rather simple in nature and quite easy to overlook even by the most careful excavators. They are typically flat slabs of limestone, which are ubiquitous throughout the landscape and a common building material for ancient and modern Cypriots, so they may often be mistaken for wall tumble or other architectural debris. When examined carefully, these slabs may exhibit patterns of small, roughly pecked depressions, typically forming either a spiral pattern of varying numbers of depressions, or a rectilinear arrangement of three rows of ten depressions (Fig. 4.1).

Since the spiral pattern was found most prominently at first, they were originally believed to be "offering tables" for the pouring of libations or the placement of offerings in ritual settings (Swiny 1976), in comparison to similar artifacts with circles of depressions known from the Aegean, particularly Crete, known as *kernoi* (Evans 1930: 390; Marinatos 1969: 15; van Effenterre 1955). This comparison was abandoned with increasing evidence of the rectilinear pattern's popularity, as it quickly vastly outnumbered instances of the spiral arrangement. In some cases, these patterns have been found on opposite sides of the same artifact, confirming some sort of relationship between the two patterns.

Turning away from the west, Swiny found better comparison for the burgeoning Cypriot corpus in the Levant and Egypt. He noted the similarity between these patterns and two known Egyptian games, *senet* and *mehen*. *Senet* was long known as one of the most popular games of antiquity and has a field of 30 spaces as its playing area, arranged in three rows of ten in the same fashion as the rectilinear pattern on Cypriot stones (Fig. 4.2). *Mehen*, a less-popular but, nevertheless, well-known Egyptian game, consists of a

varying number of spaces arranged in a spiral pattern, which is also analogous to the Cypriot spiral patterns as they do not display a predetermined number of depressions (Fig. 4.3). Further evidence from Sotira *Kaminoudhia* (Swiny 1986a: 57–8) and Lemba *Lakkous* (Swiny 1982) placed the earliest Cypriot spiral patterns as contemporaneous with Egyptian *mehen*, which was no longer played in Egypt after the end of the third millennium BCE (Piccione 1990b: 47; Vandier 1964: 489).

Therefore, morphological and chronological considerations pointed to the identification of these patterns as Cypriot versions of *senet* and *mehen*. Despite this, at the time of Swiny's discussion, there was little evidence pointing to the type of contact between Cyprus and Syria-Palestine, much less Egypt, that would bring such games to the island. Evidence for contact with Cilicia appeared to be more prominent at the time, and Swiny envisioned a circuitous path by which the games arrived to Cyprus from Egypt through Syria-Palestine, into Cilicia and then to Cyprus (Swiny 1986a: 58), despite the lack of evidence for these games anywhere in Anatolia at such an early date. This lacuna in the discussion of these artifacts has led to doubts about the connection between them and *senet* and *mehen*, though they are still accepted as games of some sort (Frankel and Webb 2006a; 1996: 86–7).

In the 28 intervening years between Swiny's seminal works and the present, nothing has been published treating the Cypriot corpus in a comprehensive manner. The Cypriot games have only been discussed in reference to similar finds in other regions (Bieliński and Taracha 1992; Hillbom 2000–2001; 2011) or published as excavation finds. In light of the increased number of anthropological archaeologists now excavating and studying the island as well as increasing methodological and theoretical rigor in the

study of games and play, one must situate and reexamine the Cypriot corpus of games appropriately. It is necessary to determine if their identification as games holds up to the standards of scholars studying games in other regions as well as to situate them among anthropological discussions of Cypriot archaeology.

2. Identification of Games

Ethnographic sources have long recognized that patterns of depressions are often created for use as board games. Davies, in studying the Kababish of Sudan, observed them scooping out depressions in the sand to play their spiral game *li'b el merafib* (Davies 1925: 145). In particular, groups throughout Africa have been observed playing various types of mancala games in hollowed-out depressions in the soil (Loeb 1963: pl. K; Merriam 1953: 170; Pankhurst 1971; Tournay and Tournay 1971; Townshend 1979b: 110). While these accounts have aided archaeologists in the identification of patterns of depressions found in the course of excavation and survey, a consistent methodology has not been developed to determine what is a game and what is not, as depressions in stone may also serve other purposes, such as astronomical diagrams, symbolic configurations, or for production of liquids (Bardanis 1966; 1988/89; Boot 1999; van den Brink *et al.* 2001; Waddington 1998; Weisgerber 1982: 77).

In reviewing a sample of the literature in which scholars have identified games in archaeological contexts worldwide, four commonalities were found among the methods used by researchers in determining what constituted a game: morphological comparison to known games, recurring patterns, games contexts, and location. The various methods used can each be convincing in their own right, depending on the peculiarities of the

individual finds, but, as in all archaeological discourse, the most convincing arguments are those that use multiple lines of evidence to arrive at the same conclusion. Below, I discuss the merits and drawbacks of each of the methods employed, using compiled examples for each method.

Morphological Comparison to Known Games: Typically, these studies draw comparisons between the patterns found at a particular site and games known from ethnographic, historical, or archaeological sources. It is often a crucial method in demonstrating that a pattern is a game, as some of the patterns display unique attributes that are unlikely to have been used for other purposes. However, such arguments can be less convincing when used as the only basis for identifying simple patterns, because many of the patterns seen (spiral, lines of depressions) are common artistic motifs that may be unconnected to games.

Of course, the earliest games identified in the archaeological record were those corresponding morphologically to Western conceptions of what a game board should look like: namely, a checkerboard pattern of playing spaces, accompanied by a set of pieces, a series of holes accompanied by pegs, or an arrangement of abstracted spaces in an arrangement similar to that of modern backgammon. This led to the swift identification of the most famous games of antiquity: Egyptian *senet* (e.g., Nash 1902; Pieper 1909; Quibbell 1913) and *mehen* (Petrie 1896; Ranke 1920), the Mesopotamian "Royal Game of Ur" or "twenty squares" (Woolley 1934; Gadd 1946), "Hounds and Jackals" or "fifty-eight holes" (Carnarvon and Carter 1912; Gadd 1934), the Roman *ludus latrunculorum* and *duodecim scripta* (Lamer 1927; Austin 1934; 1935) and

Mesoamerican *patolli* (Tylor 1879; Brinton 1894). These archaeological games, as well as those found in historical (e.g., chess, backgammon, *pachisi*, *hnefatafl*) and ethnographic studies (mancala), have served as the basis for identifying games in non- or preliterate societies.

In some cases, ascribing a gaming function to an arrangement of squares or depressions can be fairly straightforward. For example, three inscribed checkerboard patterns found on the rooftop of the Temple of Khonsu at Karnak in Egypt closely mirror the layout of the *senet* game, that is three rows of ten squares (Jacquet-Gordon 2003: 30, 78, 84). The geographic location of these games in Egypt makes sense for its identification as *senet*, but the strongest argument comes from the markings within the squares. Numerous *senet* boards from Egypt display distinctive markings in particular squares, which are believed to have affected the outcome of the game (Piccione 1990a; 2007; Pusch 1979). The games found at the Temple of Khonsu display the same markings as those on boards found in Egyptian tombs, and so the identification of these graffiti boards as *senet* is clear.

In some instances, the pattern of the depressions (or squares) is distinct enough to demonstrate that it is the form of a particular game. The game of twenty squares, a later version of the Royal Game of Ur, is one such game (Fig. 4.4), with an arrangement of a main body of three rows of four spaces, accompanied by a "bridge" of eight squares extending from the central row (Pusch 2007; Dunn-Vaturi 2012). Meyer, discussing some unusual finds from Kamid el-Loz (ancient Kumidi) in Lebanon, demonstrated the existence of this game in the form of a liver model, where the eight square bridge was curved (Meyer 1982) on a board that is liver-shaped. Games such as "nine-men's morris"

are easily distinguished by their distinctive pattern of incised lines (Fritz and Gibson 2007; Sebbanë 2000), as are alquerque games with their intersecting diagonal lines and triangular projections (Rogersdotter 2010).

In other cases, using only a pattern of depressions or incised lines that is less distinctive can be less convincing, especially when used as the only evidence that a pattern was used to play a particular game. At the site of ‘Ain Ghazal in Jordan, a stone with a pattern of two rows of six depressions was found and suggested to be an ancient form of mancala, which would predate the earliest definitive existence of the game by millennia (Rollefson 1992). Without contemporary evidence for the existence of the game, or a demonstration of continual play of mancala extending back to this early period, this identification was in question. Indeed, upon further examination of the board, it was found that it was more likely to have been used to aid in the production of fire through the rotation of wooden sticks in the holes (Goren-Inbar *et al.* 2012). Likewise, Kendall identified the modern game of *li’b el-merafib* in Sudan as a derivative of the ancient Egyptian game *mehen* (Kendall 1989: 711-16; 2007: 43-4). Similarly to the alleged Neolithic mancala game at ‘Ain Ghazal, *li’b el-merafib* is separated from the latest known example of *mehen* by roughly four millennia, thus making any connection difficult to demonstrate, at best.

Recently discovered artifacts from Belgrade contain two rows of six carefully carved depressions and have been argued to represent a version of this game in the Balkans (Bikic and Vukovic 2010). In this case, there is not a discontinuity in time between the known game and the newly discovered example; rather, there is one in space, as mancala is not known to exist in the Balkans, and a demonstrable method by which it

may have come to that city has not been discussed by the authors. Without further discussion, such a positive identification requires further examination.

To review, comparing newly found patterns of depressions (or of incised patterns) to those of known games is most successful when they share unique characteristics, such as distinctive markings within playing spaces, or unique arrangements of the playing field. In order to use comparison as a method for simpler patterns, such as simple rows, circles, or spirals of holes or squares, this method must be used in conjunction with others to make a convincing argument that they were used for games. Furthermore, geographic and chronological factors must be considered to give an argument further weight.

Recurring Patterns: In many cases where games have been identified through their similarity to other known games, the comparison is strengthened because the pattern appears multiple times in the same region, or even at the same site. When depressions or incisions appear in multiple locations containing the same number and arrangement, it is likely to represent a conscious reproduction for some particular purpose. This purpose may not always be for the playing of games, as certain patterns may have culturally specific meanings ranging from good luck and curses to representations of constellations (Bardanis 1988/89; Schadler 2012). Therefore, like any other method of identifying games, it is best used in conjunction with other lines of evidence to make informed conclusions.

It is crucial to note that many groupings of depressions found throughout the ancient world do not have an apparent pattern to them and, thus, cannot be ascribed a gaming function. Some depressions are overly large and deep to have been used as a

board game and are found in small numbers throughout Anatolia and the Levant (Deonna 1934; Guthe 1890; Ussishkin 1975). These types of depressions were more likely used in manufacturing processes, perhaps in the processing of liquids (van den Brink *et al.* 2001). Other groupings sometimes form no distinct pattern, and their purpose cannot be determined (Anati 1963: 102, 155, 278, 281, 282; Guthe 1890: 126; Hillbom 2011: 113).

The Aegean islands are one area of the world in which patterns of depressions have been noted, but little consensus exists as to what their function might be (Bardanis 1966; 1988/89; Hillbom 2003; 2011; Hood 1995; van Effenterre 1955). Crete, in particular, has produced many patterns of depressions, the most common pattern of which is a circle of 10 or 12, sometimes with a dividing line bisecting the circuit, which Hillbom calls "10-Ring" or "12-Ring" (Hillbom 2003: 45–6; 2011: 110–1). Many of the other fields of depressions that have been found throughout Crete do not seem to follow any kind of predetermined pattern suggestive of a game. Since the Minoan Linear A writing system has yet to be deciphered, no texts can be read that refer to games in the Bronze Age Aegean, and neither 10-Ring nor 12-Ring correspond to games known from Classical Greece, such as *pente grammai* or *polis* (Kurke 1999; Schädler 2012: 21), so there are no known analogous games.

In contrast, there are many spirals of depressions found on the islands of Naxos and Irakleia (Kanakis 2011) in the Cyclades, which some have connected to the *mehen* spirals found on Cyprus and the Levant and, thus, ultimately connected to Egypt (Swiny 1986a: 59). They have been catalogued by Bardanis, who believes they are astronomical signs, in some cases representing constellations (Bardanis 1966; 1988/89). In any case, it is apparent that many of these spirals cannot have functioned as games, since they appear

on vertical rock faces, rendering play impossible on such surfaces. Similar spirals are known from the British Isles (Waddington 1998 for references and some examples), which also were on surfaces unsuitable for playing. Furthermore, the connection between the Cyclades and the Near East, and, thus, a possible connection between the spirals and *mehen*, is not easily demonstrated. Similar to the identification of mancala in the Balkans, there is considerabnle spatial distance between those who are known to have played *mehen* and the Aegean, casting doubt on such an interpretation for the Cycladic spirals.

The circuits of depressions exhibited by 10- and 12-Ring are always found on horizontal surfaces, so the possibility that they were used as games cannot be so easily discounted. In order to further his case for these patterns as games, Hillbom employed another method used to identify games: their location.

Location; Ethnographers and games researchers have long mentioned that games are often played in open air public spaces (de Voogt 2003: 97; 2005: 218; Finkel 2004: 56; Herskovits 1932: 31; Popova 1976: 440; Tournay and Tournay 1971; Townshend 1979a: 795) but archaeologists have only sometimes referred to this in their analysis of patterns of depressions and incisions.

Hillbom (2011: 90–1) notes that all of the 12-Ring patterns he catalogued in Crete were found in open public areas with unrestricted public access, following Palyvou's spatial analysis of Minoan sites (2002). Furthermore, many were placed out of the way of the flow of traffic, such as next to walls, in corners, on the sides of streets, "wherever it was convenient to meet and sit down" (Hillbom 2011: 91). At Kommos, fragmentary

thresholds were found with depressions arranged in a circle (Whittaker 1996: 321). As semi-public areas, thresholds are common places for people to play games and interact with passers-by and individuals have been observed doing so many times on Cyprus (personal observation). At Poliochni on Lemnos, circles of depressions, including one of 12-Ring type, were found pecked into paving stones in public "corridors" (Bernabo-Brea 1976: 319, 369). At the Temple of Baal at Palmyra in Syria, games were located in public areas; none were found in the inner sanctum of the temple but were in publicly accessible open areas, in locations that provided shade for at least part of the day (de Voogt 2010: 1064).

Late Roman cities display a plethora of different games in public places, such as plazas, commercial streets, theaters, stadia, and baths (Schädler 2012: 22). However, Schädler cautions that not all graven signs in public areas are games because the placement of some, for example at the doors of temples or houses, may have certain identifying, magical, ritual, or divinatory purpose (2012: 20). Care must, therefore, be taken to avoid misidentification of symbols as a pattern intended to be used as a game.

Games Context: Related to the idea that games are played in certain locations is the concept of the games context, which is essentially a place in which different types of games are found together (Crist *et al* 2016a). Often consisting of a space of naturally exposed rock or paved area, games contexts can contain from two to many dozens of games in the same area. The people gathering in these places have, in many cases, left behind the depressions or incised squares of the games they played, and when an easily

identifiable game is present, it can help to infer that other patterns found with it also represent games.

Places in which games contexts are located in permanent locations (i.e., the games themselves are immobile) include the aforementioned games at Palmyra, where Syrian mancala and Roman mancala games were found (de Voogt 2010). On Mfango Island in Lake Victoria, a games context was found, containing the contemporary game of *ajua* or *oluko* (containing two rows of eight holes), alongside other patterns with four rows of eight depressions or two rows of six (Kenny 1978). At Vijayanagara, Rogersdotter recounted many games throughout the city, between nine hundred and one thousand in number, with many patterns of known games incised into pavements alongside other patterns that are repeated throughout the city but not known from other sources (Rogersdotter 2010). In Qatar, depressions arrayed in two rows of seven are likely to have been used for the common Middle Eastern version of mancala and were found alongside "rosette patterns;" a central depression with a ring of roughly nine cup-marks surrounding it, which may be a game known from ethnographic sources but not well documented (Hawkins 1987: 54).

Games contexts do not always have to be places in which permanently located games are situated; they can also include places where people played on portable game boards in the same locale. Such places are not commonly found archaeologically, but a prime example of one exists at the Roman fortress at Abu Sha'ar in Egypt, where "mancala" (now identified as a Roman form of *pente grammai*: Crist *et al.* 2016b: 131), merels, *duodecim scripta*, and *ludus latrunculorum* were found. In particular, six game boards were found in one room, dubbed the "gaming room" by the excavators, among

which were included both *pente grammai* and *duodecim scripta* boards (Mulvin and Sidebotham 2002: 614–5).

Furthermore, games contexts do not have to be in a certain location; rather, they can be on a single artifact, typically found in the form of double-sided boards. Double-sided boards have been discovered in contexts spanning millennia and the entire world and sometimes can help in the identification of an unknown game when a known game accompanies it on the same artifact. One example of such a board was found at Hala Sultan Tekke in Cyprus (Åström 1984: 43) which, while unfortunately fragmentary, displays a row of incised squares that is clearly a portion of the "bridge" of the game of twenty squares, due to the distinct markings contained within the squares. Alongside this game is an arc of depressions, roughly bisected by the break in the stone, with remains of five depressions visible. This pattern is consistent with the 10- or 12-Ring type known from Crete, and more recent finds on Cyprus suggest it may have been played at other sites with strong Aegean connections.

When used in concert, these methods can make a strong argument in determining whether a pattern of depressions or incised squares represent a pattern intended to be played as a game. Though every corpus of games may not allow for all methods to be used (e.g., only portable boards, hindering the interpretation of location and potentially games contexts; limited sample; patterns that do not conform to known games), the best determinations are made using all available evidence. The Bronze Age Cypriot corpus, due to its large size and number of locations in which the games were found, allows for the utilization of all of these methods in order to reassess whether these games may be called justifiably *senet* and *mehen*, or at least Cypriot versions thereof.

3. Reassessing Cypriot Gaming Stones

The most recent count of patterns of depressions from Cyprus that are candidates to be identified as games stands at 418. Most of these are on limestone fieldstones, similar to those first identified by Swiny, though a small number were pecked into igneous stones or bedrock outcrops. Of the 418 examples, 151 were found intact, with the entire pattern of depressions preserved (though the stone itself may have been damaged).

Recurring Patterns: Of those intact arrangements, 99 exhibit three rows of ten depressions; 23 display a spiral of varying numbers of depressions; two have four rows of ten depressions; two contain a circle of ten depressions; three have a single row of ten depressions; one contains five rows of ten, and another stone displays five rows of sixteen (Fig. 4.5). Two stones from Anoyira *Peralijithias* display dramatically different patterns: one contains a pattern of 147 depressions arranged in three rows outlining a triangle, while the other contains two sets of three rows of ten running perpendicular to each other and sharing two depressions (Swiny 1986: 35).

Of the fragmentary patterns found on Cyprus, the great majority definitively disaplayed a pattern that consisted of three rows (139 examples). That is, the extant portion of the games that remain had three rows of depresseions preserved. Eighteen of the broken arrangements display a clear spiral pattern; four contain four rows; one contains five rows; and four contain one row. Since, in the sample of intact patterns all those with three rows have ten depressions in each row, it can be inferred that those fragmentary games with three rows once displayed three rows of ten cup-marks. Only four examples in the entire corpus of rectilinear patterns (n=280) contain more than ten

depressions in a single row. These data point to the three by ten pattern as the predominant recurring pattern of depressions throughout the Cypriot Bronze Age and, thus, suggest some kind of meaning for this specific arrangement of cup-holes. The spiral pattern is also commonly repeated, though with less frequency than the rectilinear pattern. Nineteen examples are only partially preserved and all display a clear spiral pattern. Other patterns that exist in fragmentary form are one with five rows, apparently originally with ten depressions in each, two with four rows, another four with one row of depressions, and two fragmentary games of twenty squares, distinguishable by their distinct pattern of squares and markings.

This evidence, therefore, suggests a great deal of uniformity within the assemblage. Of the intact games, 65.5% have three rows of ten cup-holes, and 15.2% display a spiral pattern, leaving only 19.2% of the assemblage that display other patterns. The fragmentary artifacts reflect a similar distribution, with 72.3% displaying three rows, 13.0% originally with at least two rows, 9.3% displaying a spiral pattern, and the other variations making up 5.2% of the corpus. Three rows of ten depressions is the overwhelmingly preferred pattern, followed by a spiral with considerably fewer examples. The circle of ten pattern, appearing three times, is the only other configuration that appears more than once. The other patterns may be intentional, but with a different use, or they may form these patterns unintentionally. One possible interpretation of the stones displaying a single row of depressions is that they are unfinished three by ten patterns.

Morphological Comparison to Known Games: Since both the spiral pattern and the three rows of ten first appear in Cyprus during the third millennium BCE, only three games are contemporary to them and, therefore, available for comparison: the Royal Game of Ur from Mesopotamia, as well as *senet,* and *mehen*, the latter two from Egypt. The Royal Game of Ur, with its characteristic pattern of playing squares, can be immediately ruled out as an analogue for either Cypriot arrangement. The Egyptian games, of course, have already been discussed by Swiny as featuring the same patterns as the Cypriot games: three rows of ten spaces and a spiral of any number of spaces (Swiny 1980; 1986). The Cypriot rectilinear pattern never has any distinguishing marks for any of the spaces, though later Egyptian *senet* boards do (Piccione 1990a; Pusch 1979). While such markings would clearly identify the Cypriot patterns as versions of *senet*, their absence does not discount it. While markings appear on the patined representation of *senet* on the wall of the Third Dynasty Tomb of Hesy-Re (Quibell 1913: 18–21), the earliest *senet* board with markings dates roughly two hundred years later than the patterns appeared on Cyprus (i.e., the game from the cenotaph of Sesostris III, who died around 1839 BCE; Piccione 1990a: 390). It is therefore unclear whether Egyptian *senet* boards had markings uring the third millennium BCE. The only markings present on *mehen* boards are the head and tail of the snake, which are sometimes represented on the game board. Some of the Cypriot spirals have central or outermost depressions that are distinguished from the others because of their larger size (Swiny 1986a: 49–50), corresponding to the placement of the head (center) and tail (outer circle) of the serpent in the Egyptian boards. This analogy is, however, not definitive evidence for a connection between the Cypriot spirals and *mehen*.

Chronologically, the first appearance of the spiral motif and the rectilinear pattern on Cyprus both correspond to periods of the apparent popularity of *mehen* and *senet* in Egypt. The earliest spiral on the island came from a late deposit at the Chalcolithic site of Lemba *Lakkous* (Swiny 1982) dating to the beginning of the third millennium BCE. This corresponds to the apparent greatest popularity of the game in Egypt, since most of the *mehen* boards known archaeologically date to the later fourth and early third millennia BCE (Kendall 2007: 35–9). *Senet* seems to have become more popular later: while it clearly existed in the Fourth Dynasty, since it was referenced in a relief in the tomb of Prince Rahotep (Petrie 1892: 38), evidence suggests it increased in popularity through the Old Kingdom, and by the Fifth and Sixth Dynasties it was the most commonly represented game in funerary reliefs (Piccione 1990a: 49–72). Likewise, in Cyprus, evidence from Marki *Alonia* (Frankel and Webb 2006a: 246) and Lemba *Lakkous* suggests that the spiral pattern arrived before the rectilinear pattern, as spirals were known from Late Chalcolithic and early PreBA 1 (2400–2000 BCE) contexts, but the earliest examples of three rows of ten depressions date to the Early Cypriot III period (middle to end of the PreBA 1), 2250–2000 BCE.

With a solid chronological connection between the Cypriot patterns and the Egyptian games, one must look to cultural processes that may have led to their adoption in Cyprus. Demonstrating a connection between the games' place of origin and the island, even if indirect, would serve to strengthen the argument that these configurations of depressions were played as games. *Senet* is found outside the Nile Valley during the third millennium BCE, most conspicuously at Arad in southern Canaan and Byblos in modern Lebanon, both of which had extensive trade interactions with Egypt. Arad was

important for the procurement of copper before the Egyptians seized the copper mines in the Sinai (Ilan and Sebbanë 1989: 153) and Byblos was a crucial trade colony for the Egyptians who were interested in acquiring cedar in Lebanon (Gale et al 2000: 349; Montet 1962; Prag 1986).

At Arad, 46 senet games were found in the settlement (Sebbanë 2001), and many of them serve as morphological intermediates between the Egyptian boards and the Cypriot patterns of depressions. Most Egyptian *senet* boards consist of a playing field with thirty squares, and many stones with three rows of incised squares have been found at Arad during the Early Bronze Age II (3000–2700 BCE), when the most intensive Egyptian activity at the site occurred (and in Canaan, in general) (Amiran 1978: 51; Ben-Tor 1992: 119–120; Kempinski 1989: 166). Other stones have been found at the same site with three rows of ten drilled holes (Fig, 4.6), and yet others with the drilled holes in the center of the incised squares, demonstrating that these two methods of manufacturing the pattern are meant to produce artifacts that function in the same way: as games.

Similarly to the games at Arad, Byblos produced four examples of a three by ten pattern. Again, incised, drilled, and a combination of both were found at Byblos (Dunand 1954: 310, 1958: 531, 559, 661). An Egyptian presence has been well attested at Byblos, and an Egyptian trading colony was established there at least by the end of the Old Kingdom (Marcus 2002: 406-7; Montet 1962: 87-8; Prag 1986: 66-7; Saghieh 1983: 105-6), precisely the time when the rectilinear pattern of depressions first appeared on Cyprus.

Mehen is less easily traced from Egypt through the Levant. Stones with depressions configured in a spiral pattern have been found at Lachish (Tufnell 1958: 40)

and Bâb edh-Dhrâ' (Rast and Schaub 2003: 637), in the case of the latter with other stones containing three rows of ten depressions (Rast and Schaub 2003: 636–7). Another was found far to the north at Tell Brak in Mesopotamia (Oates *et al.* 2002: 266–7).

When Swiny first studied these artifacts on Cyprus, little was known about the third millennium BCE on the island, particularly from settlement sites, of which none had been scientifically excavated. Since then, extensive excavation campaigns at Sotira *Kaminoudhia* (Swiny *et al.* 2003; 2008) and at Marki *Alonia* (Frankel and Webb 1996; 2006a) have greatly expanded knowledge of this time period on the island. Furthermore, the expansion of anthropological theory into archaeological research on the island has improved the level of interpretation of the material record of the island and has brought new insights to the types of interactions that took place during the prehistoric periods.

As discussed above, in 1986 Swiny mentioned that the archaeological evidence pointed to little contact between the island and the mainland, with the exception of Tarsus in Cilicia. The new excavations and reexamination of previously excavated materials have changed this interpretation, suggesting that Cyprus was more integrated with the surrounding mainland societies. On the basis of lead isotope analysis of bronze artifacts from PreBA sites on the island, Cyprus appears to have been taking a part in a "third millennium interaction sphere" involving the seaborne trade of metals or metal artifacts (Webb *et al*. 2006). Imports from Crete, the Levant, and Anatolia have all been documented on the island (Knapp 2013: 309), as well as three gypsum vessels that appear to have had their ultimate origin in Egypt (Merrillees 2009). There have also been metal artifacts on the mainland that have been sourced to Cyprus (Kassianidou and Knapp 2005: 236–8; Philip et *al*. 2003). There was, therefore, enough contact with the mainland

in order for Cypriots to interact with others playing the games and then to bring them back to the island.

Indeed, there is evidence that contacts with the mainland involved more than just the import and export of goods. There is plenty of evidence on the island for the introduction of intangible forms of knowledge, such as methods of textile production (Knapp 2008: 119). Gaming could also form one type of such intangible knowledge. In discussing the "compelling evidence" for a foreign presence on the island, Knapp argues that people were coming to the island and living in non-traditional, intermixed regional groups, developing new patterns of group affiliation (Knapp 2008: 129). Certainly, some of these people may have come from the Levant and potentially introduced games as a way to interact across the inherent social boundaries that existed. While this is a possibility, evidence for the secific mechanism by which the games were transmitted to Cyprus is lacking, especially due to the lack of archaeological exploration in the north of the island, where such contacts with the mainland would have taken place.

Location: At the time of Swiny's original analysis, few of the patterns of depressions known from Cyprus were from excavated contexts and, thus, the locations in which they were played were not taken into consideration for his analysis. The results of subsequent excavations have produced configurations from primary contexts that are consistent with the placement of games at other archaeological sites.

As mentioned above, games have been found on thresholds of doorways, both in the archaeological record and in the present day. In Cyprus, the arrangement of three rows of ten depressions has appeared on stone thresholds. At Alambra *Mouttes,* a large

stone threshold was found in the doorway between Rooms 3 and 7 of Building I (Coleman *et al*. 1996: 174–5). At Maa *Palaeokastro,* two thresholds damaged from use were found with depressions arranged in three rows, one on the entrance to the street and one on the entrance to a major courtyard (Karageorghis and Demas 1988: 46, 48–50). A threshold with the three by ten pattern was discovered by Swiny during survey at Evdhimou *Stympouli* (Swiny 1986a: 34). A final rectilinear pattern was discovered on the step down from the street into the large walled open space at Sotira *Kaminoudhia* known as the Unit 12 Complex, though it was found upside down (Crist in press).

Within this open-air complex, the largest concentration of stones with depressions, both of the rectilinear and spiral type (fourteen in all), was found. This space has been interpreted as non-domestic in nature, potentially ritual (Swiny 2008: 48–50), but certainly public due to its large space and ability to accommodate gatherings of people. Another open-air courtyard space at Sotira *Kaminoudhia,* Unit 2 (Swiny *et al*. 2003: 39–41), produced two stones with rectilinear patterns of depressions, as well as evidence for drinking, and, thus, has been identified as another public space where people gathered.

At Marki *Alonia*, spiral and rectilinear patterns were also found in open air spaces, though primarily within domestic contexts. Compounds 6 and 7 both produced stones with depressions from their courtyards, and a stone with a spiral pattern was found embedded into the floor of Compound 24, a walled open space. (Frankel and Webb 2006a: S220, S456, S457, S534, S688).

At Episkopi *Phaneromeni*, three intact rectilinear patterns of depressions were found in Room 13, a large space that was likely unroofed (Swiny n.d.). Therefore, the

three sites that have produced the greatest number of stones with depressions (Sotira *Kaminoudhia*, Marki *Alonia,* and Episkopi *Phaneromeni*) have all produced them from open air spaces, some of which were public. The public nature of games is also apparent at sites that have not produced as much evidence for the kind of activities that were contingent upon the use of open spaces.

Games Context: Among the artifacts discussed by Swiny were stones that displayed the spiral pattern on one face and the rectilinear arrangement on the opposite (S179, S244, S280, S281). Six others have since been found, all of which show the same configuration of rows of depressions on one side and a spiral on the other. Double-sided boards are one type of games context that can help identify a game due to its association with a known game (Crist *et al.* 2016a). The appearance of both patterns on the same artifact, in multiple instances, shows a relationship between the two types, but without the use of the other methods already discussed, it would be impossible to determine if either pattern of depressions was used to play a game.

Conclusion: The evidence connecting the Cypriot rectilinear pattern to the Egyptian game of *senet* is initially the more obvious argument. It is the dominant recurring pattern on the island, and it conforms closely to the layout of three rows of ten spaces known from the Egyptian game. It appears on the island at about the same time the Egyptians established a colony on the opposite shore of the Mediterranean at Byblos, when the game itself was increasing in popularity among Egyptians. The morphological difference from the Egyptian originals, i.e., rows of depressions rather than rows of squares, is also

represented in the Levant, where there is also a hybridization of the two methods of manufacture. These patterns have been found in public and semi-public, often open-air spaces which have been shown ethnographically and archaeologically to be favorite locations for players of games. Therefore, a strong case can be made to identify the three rows of ten depressions on the island as a Cypriot version of Egyptian *senet*.

Evidence for the presence of *mehen* is less clear-cut than that for *senet*, since it is not as commonly found in Egypt, the Levant, or in Cyprus. It is the second-most recurring pattern on Cyprus and shares the spiral morphology and sometimes the accentuated central or outermost depressions with the Egyptian game of *mehen*. It appears in Cyprus during the height of its popularity in Egypt, though Egyptians were less active in Byblos in the mid-third millennium BCE than they were when *senet* came to the island. Spirals have only been found sporadically throughout the Levant, so its presence in the lands immediately adjacent to the island is not as well documented as that of *senet*. Spiral patterns have been found in similar public and open air spaces as Cypriot *senet*, in one instance (the Unit 12 complex at Sotira *Kaminoudhia*) in the same space as *senet*. This typical gaming location, as well as its presence alongside *senet* in Unit 12, points to its identification as a game; however, the strongest case for the identification of the spiral pattern as a game comes from the double-sided stones displaying Cypriot *senet* on the opposite side. Having occurred in such numbers with such morphological similarities, spatial distribution, and association with *senet*, it seems likely that the spiral pattern was a Cypriot version of Egyptian *mehen*.

This exercise suggests that the identification of games in the archaeological record, particularly for preliterate societies, can be difficult and requires many lines of

evidence in order to determine the function of seemingly difficult-to-interpret patterns of depressions. Fortunately, Cyprus has produced a greater number of archaeologically documented stone game boards than anywhere in the world, providing a large enough sample to allow such an analysis. Typically, games in other regions have been made of wood, textile, other perishable materials, or made expediently in the soil, so evidence for them has not been preserved. This large corpus may also allow for further investigation of the practice of gaming as it relates to other social processes that have not been possible in other regions due to the limited evidence available for gaming practices. With continuous evidence for Cypriot Bronze Age gaming providing significant time-depth (roughly 1500 years), long-term social processes can be examined for the first time, and one of the most fundamental processes of societal change, that of increasing social complexity, can be examined in the light of play actions. Of particular interest is the tension between the social lubricant nature of games and the increasing social boundaries inherent with the rise of socio-economic class structure. In the following chapter, the relevant social processes for PreBA and ProBA Cyprus are discussed, and the processes through which the social context of games is expected to change are postulated.

V: Social Complexity on Bronze Age Cyprus: Processes that May Effect Gaming

1. Overview of Bronze Age Cyprus

The beginning of the Bronze Age on Cyprus remains a controversial period that has been incompletely explored archaeologically. Recent evidence suggests an overlap between the long-recognized precursor to the Bronze Age, the Philia phase, and the Late Chalcolithic period on the island. Much discussion has taken place regarding the nature of the Philia phase, with its distinct material culture and practices that differ from that of the Chalcolithic, regarding whether these changes represent indigenous developments or an influx of settlers from Anatolia. What is apparent is that the Philia culture and the changes in architectural styles and subsistence that herald it represent a break from the preceding Chalcolithic period, while other types of material culture, such as stone and ceramic artifacts, demonstrate continuity. Marki *Alonia* remains the only excavated settlement site with Philia remains, and until more stratified sites are excavated the transition from the Chalcolithic to the Bronze Age will remain a point of contention among Cypriot archaeologists (see Fig. 5.1). Despite this, there are important societal changes that are apparent during this period that are relevant for study of the social processes pertinent to the Cypriot Bronze Age.

Archaeological evidence suggests an overlap between the Late Chalcolithic and the beginning of the Philia phase on Cyprus (Knapp 2013: 265). Only two Late Chalcolithic sites have been sufficiently excavated on the island, Lemba *Lakkous* and Kissonerga *Mosphilia*, with only the latter producing Philia deposits, though they are disturbed (Peltenburg 1985; 1998). These Late Chalcolithic sites, particularly at Kissonerga, show the adoption of burial practices that suggest contact with contemporary

Philia communities in the northeast of the island (Keswani 2004: 39; Webb and Frankel 2011: 34). The settlements, however, are typical of other Cypriot Chalcolithic sites: circular houses without interior partition walls containing distinctive hearths on circular platforms, as well as typical Chalcolithic ceramic assemblages (Webb and Frankel 2011: 31). Marki *Alonia,* a PreBA site, the earliest phase of which is contemporary with Late Chalcolithic *Mosphilia (*roughly 2500 BCE)*,* demonstrates rectilinear, agglutinative architecture with ceramics in the Red Polished tradition, with heavily Anatolianizing elements, all typical of the Philia phase and the Cypriot Bronze Age (Frankel and Webb 1996a; 2006a, 2006b; Webb and Frankel 1999; 2011). A later adoption of the suite of Philia material culture at *Mosphilia* (and at the nearby site of Kissonerga *Skalia;* Crewe 2010: 71) suggests a slower adoption of new practices in the western portion of the island than in the northern and central sites, where Philia evidence is most prominent (Swiny 1997: 177–85; Webb and Frankel 1999: 7–13).

The introduction and spread of Philia material culture on the island has variously been described as a migration event from Anatolia (Webb and Frankel 1999; 2007; 2008; 2011), as an indigenous development in response to new social and economic realities in the Eastern Mediterranean (Knapp 1993; 2001; Swiny 1986b), or more recently as a process of hybridization due to increasing movement of people into the island from Anatolia, along with indigenous responses to these new encounters (Knapp 2008: 129–30; 2013: 268–77). Knapp suggests that the material and social changes brought about during the Philia phase, continuing into the PreBA:

> are better treated in the trajectory of 'third space,' another aspect of hybridization practices. Neither Cypriot nor Anatolian, they represent the outcome of still unknown or at least ambivalent interactions between these two groups of people; such interactions occur both within and against the

> binary structures of culture and identity. People involved in hybridization practices renegotiate their identities at least in part by revamping their material culture. (Knapp 2013: 344)

The changes that first appeared during the Philia phase (architectural, mortuary, foreign and intra-island contact) became the basis for PreBA culture, developing "a social system capable of generating and absorbing continuous change" (Knapp 2008: 129). The changes that occurred during the Philia phase were not just a break in cultural continuity; they were a newly developed system in which Cypriots continued to renegotiate their identities throughout the PreBA.

With respect to gaming, changes in the construction of space and in the kind of inter- and intra-community interactions that occurred during the PreBA are likely to have been the most influential in changing the ways games were played. The earliest game on Cyprus, the *mehen* board found at Lemba *Lakkous*, dates to the Late Chalcolithic but was found in secondary context built into a wall (Swiny 1982). It is the only known board from a context predating the Bronze Age (likely due to the limited archaeological excavation of Late Chalcolithic sites), and no comments can be made about the original contexts in which *mehen* was played during this period. However, the contexts in which it was played during the PreBA can be assessed and discussed in the light of ongoing processes of social change initiated during the Philia phase that continued through the end of the period. Discussion of all the societal changes during the PreBA lies outside the scope of this study, but the organization of space, feasting, as well as intra-island and foreign interaction have the greatest import for discussion of social complexity and gaming (as discussed in Chapter III).

The Protohistoric Bronze Age (ProBA) on Cyprus saw further changes to the structure of society, as the island became increasingly incorporated into the surrounding region's web of interactions, largely due to increasing exploitation and demand of the island's copper resources. The small-scale, agrarian, village-based society of the PreBA became one with coastal centers, elite lineages, and the accumulation of wealth and power (Keswani 1996; Webb 2005). Many of the processes seen in the PreBA can also be seen occurring in the ProBA, but on a larger scale (Knapp 2008: 134–201; Knapp *et al.* 1994: 224–9), brought about by increased population and contact with the mainland and Aegean. The major changes seen during the ProBA were (after Knapp 2013: 348):

a. town centers with monumental architecture
b. burial practices showing clear distinctions in social status
c. writing (Cypro-Minoan) on clay tablets, cylinders, and other materials
d. intensified and widespread production and export of copper
e. extensive regional and interregional trade (especially with the Levant and the Aegean)
f. newly built fortifications, weaponry in burials, warriors depicted on pottery

Utilizing existing data on ProBA sites, Knapp proposed a four-tier settlement hierarchy for the island based on site size and function (Knapp 1997, 2013: 354–6):

1. Coastal centers

2. Inland towns

3. Smaller inland sites

4. Agricultural and pottery-producing villages, mining sites.

At the top of the hierarchy are the large coastal sites with monumental architecture and high proportions of foreign goods: Enkomi, Kition, Maroni, Hala Sultan Tekke, Morphou

Toumba tou Skourou, Kalavasos *Ayios Dhimitrios*, Episkopi *Bamboula*, Kouklia *Palaepaphos*, and the major inland site at Alassa. These centers probably served commercial, ceremonial, and administrative functions. The second tier contains towns that are usually, but not always, further inland, with some administrative and production functions (Maa *Palaeokastro*, Pyla *Kokkinokremos*, Phlamoudhia *Melissa*). The third tier consists of small inland sites with ceremonial, production, and transport functions (Mytrou *Pighades*, Athienou). Finally, the fourth tier were small production sites including agricultural, mining, and pottery workshops (Aredhiou *Vouppes*, Ambelikou *Aletri*, Episkopi *Phaneromeni*).

It is debated whether this new settlement organization was imposed from the top down by elites in the coastal centers exerting hegemonic power on inland sites (Stanley Price 1979: 80), or whether it developed as a more organic response to increasing demand for copper and agricultural goods in the increasingly urbanizing coastal centers, but it is generally accepted that the coastal centers exhibited some form of control over smaller sites, either overtly or through alliances with local elites (Keswani 1993; Knapp 2013: 356).

Much like the PreBA, many of the changes of the ProBA, while important, lie outside the scope of this research, as they do not relate to gaming. Again, the redefinition of space, feasting, and internal and external interactions will remain the focus because of their pertinence to the playing of games, but also for evaluating how gaming relates to these changing practices. Knapp's enumeration of changes highlights the types of societal developments that affected social interactions. Their respective entanglements were shaped by these four kinds of change, but also changed them, in turn.

2. Organization of Space

Space was shown in Chapter III to be an important determinant in culturally specific rules regarding where it is appropriate to play. With the beginning of the Bronze Age, the organization of space within settlements changed dramatically, and, thus, the spaces in which games were played are also likely to have changed. During the Chalcolithic, the preferred house form was a circular structure, groups of which were often arranged around larger open spaces (e.g., at Lemba *Lakkous;* Peltenburg 1985: 318, 326–9). Such configurations of circular structures may have functioned as a family compound with specialized activity areas (Knapp 2013: 247). As mentioned above, it is unclear in what kinds of spaces games were played during the Chalcolithic, but ethnographic sources suggest that games are most often played in open spaces, particularly where there is shade. It is, therefore, possible that these open spaces between the circular structures may have been where games were played. This may account for the dearth of game boards known from Chalcolithic sites, though they are known to have existed in the Late Chalcolithic due to the secondary use of the Lemba *mehen* board as building material.

If, indeed, open spaces were the preferred spaces for gaming during the Chalcolithic, this must have changed during the PreBA, as Bronze Age sites do not seem to contain unenclosed open spaces (Frankel and Webb 2006b: 311–2; Swiny 1989: 20). Individual households often had open spaces associated with them in the form of enclosed courtyards at Marki *Alonia* (Frankel and Webb 2006b: 289), but at Sotira *Kaminoudhia* open spaces appear to be specialized communal areas, (Swiny *et al.* 2003: 54, 58; 2008: 48–50). Large open courtyards are known at Politiko *Troullia*, though their

relationship to other roofed spaces is not completely understood (Falconer and Fall 2013: 104–5). The excavators of Alambra *Mouttes* suggest that all rooms excavated there were roofed (Coleman *et al.* 1996: 28).

These spaces also differ remarkably from those at Chalcolithic sites in that they are agglutinative, multi-roomed, rectangular structures (Swiny 1989), though different building traditions are apparent at different sites (Knapp 2013: 297–8): Sotira *Kaminoudhia* displays variation and complexity in house form (Swiny *et al.* 2003: 54–66), while the residents at Marki *Alonia* had an "idealized concept of a physical household" consisting of two or more roofed rooms set to the back of a larger courtyard, though the execution of this type varied (Frankel and Webb 2006b: 299). At Alambra *Mouttes* households conformed strongly to a distinct type, which was likely determined due to the topography of the site (Knapp 2013: 297).

Of the major PreBA settlement sites, Marki *Alonia* provides the best stratification, with multiple building phases ranging from the Philia phase to the PreBA 2. At this site, Frankel and Webb see changes in the structure of houses, with the increased use of interior space throughout time, as activity in courtyards seems to decrease. Household "compounds" became increasingly insular and isolated from one another as the site grew in population, to the point where some became fully enclosed and divided from each other with "laneways" (Frankel and Webb 2006b: 299–301). They infer a restructuring of relationships in the community, as some compounds that were once intercommunicating were subdivided into separate units. Compounds 3 and 4, which were inhabited throughout the occupation of the site, shared an open courtyard in the early phases of the settlement and presumably shared cooperative social and economic relationships. Within

one hundred years, these compounds were reconfigured so that they were no longer intercommunicating (now called Compounds 6 and 7), but were walled off from one another with entrances requiring different paths of approach. Compound 8 broke off as an offshoot from Compound 7, which "suggests that the breakdown of inter-household cooperative systems coincided with an increased emphasis on extended family relationships" (Frankel and Webb 2006b: 301). As the settlement expanded, interaction likely became more localized, with fewer and fewer interactions outside the immediate neighborhood requiring new mechanisms of social cohesion and control (Frankel and Webb 2006b: 302).

A similar argument has been made regarding long-term changes in the construction of domestic space in Anatolia. Steadman argues that the agglomerative settlements known from early sites, such as Çatal Hüyük, were a result of the communal nature of Neolithic society. Gradually through time, households in Anatolia became increasingly isolated physically and economically from one another, in concordance with the rise of socio-economic stratification (Steadman 1990: 22–3, 2000). While households in Cyprus do not show a wide range in house size as seen in Anatolia, the trajectory of increasing segmentation of the community at Marki *Alonia* is a parallel process to that occurring to the north, though over a shorter period of time.

In a study of ethnographically documented cultures, Kent examined the segmentation of the use of space and architecture in 73 different societies and found that those with more pronounced social inequality tended to have more divisions in both the use of space and in architecture (Kent 1990: 458–9). She correlates this with increasing sedentism: "As mobility becomes more restricted, societies become more segmented in

their sociopolitical organization, in their use of space, and in their architecture (Kent 1990: 462). The most comprehensive survey of PreBA sites on the island identified 44 PreBA 1 sites, while 345 were identified from the PreBA2 period (Georgiou 2007). Such an increase suggests unprecedented population growth (Knapp 2013: 278), but what may also be apparent in this settlement increase is the breakdown of the mixed agro-pastoral economy (Knapp 2013: 263; Steel 2004: 131–2), as pastoralists gradually adopted sedentism. By the very beginning of the ProBA, the percentage of ovicaprids and Mesopotamian fallow deer, the main herded and hunted meat sources commonly associated with pastoralists, declined while pig and cattle, more closely associated with agriculturalists, increased (Falconer and Fall 2013: 107–8; Steel 2004: 131). Thus, increasing segmentation such as that at Marki *Alonia* may be seen as a result of increasing social complexity, as well as decreasing mobility as pastoralists increasingly moved into PreBA settlements and became more sedentary.

These new social realities would have required negotiation, which was partially accomplished by the segmentation of domestic space and practice. Interestingly, Kent identified recreation as one part of culture that is susceptible to segmentation with increased complexity (Kent 1990: 465), and so it is expected that this may be reflected in the archaeological record at Bronze Age sites. She suggests that segmentation may be based on gender, and I suggest that segmentation may also be seen in the types of space in which games were seen to be appropriate, as well as the types of activities that co-occur with game boards. Space was redefined in the ProBA at the site-specific and regional levels, where new types of spaces were constructed to facilitate new kinds of social actions and to reinforce new socio-economic realities. For the first time on the

island, true monumentality at individual sites can be seen, and throughout Cyprus a distinct settlement hierarchy appeared. As sites became increasingly specialized, so did the buildings within the settlements (Catling 1962; Keswani 1993; Knapp 1997).

Increased specialization of space can also be seen in ProBA coastal centers, where monumental structures appear for the first time. They come in the form of multi-purpose buildings, which, some have argued, are similar in function to Aegean and Near Eastern palaces; that is, having a redistributive, administrative, and ceremonial function (Wright 1992: 273–8). Monumentality is a physical manifestation of socio-economic power, and the ability to harness and organize large amounts of resources and labor reinforces social hierarchy (DeMarrais *et al.* 1996: 18–19, 31). Elite identity was wrapped up in the monumentality of these buildings, and the activities that took place in them made them into settings of identity construction and maintenance (Fisher 2009: 204). In at least one case, the construction of a monumental building at Maroni *Vournes* involved the active destruction of a tomb, probably a deliberate demonstration of changing political authority between competing elites (Manning 1998b). Such attempts at place making, apparent from the beginning of the ProBA in the construction of forts, served to actively control the use of space, a practice for which evidence does not exist in earlier periods (Dikaios 1969–1971: 16–21; Fisher 2009: 204–5).

These monumental structures often had large areas, sometimes with a central hearth, which would be ideal for the gathering of people. Fisher performed viewshed analysis of many of these buildings in ProBA Cyprus, and found that buildings at Enkomi, Alassa *Palaeotaverna*, and Kalavasos *Ayios Dhimitrios* had public or semi-public areas, including those with the central hearths, that were likely used for important "public-

inclusive" interactions (Fisher 2006, 2007, 2009). These types of interactions between peoples of different identities served to reinforce the status quo, but also provide places for the construction of new identities through increasing social division (Knapp 2013: 381) and also the formation of collective social memory (Fisher 2009: 204).

The increased segmentation of space in ProBA Cyprus could also have led to increased limitations on the types of spaces and contexts in which games were played. Increased organization of not just space in monumental buildings, but also of production (Steel 2010), residential (Steel and Thomas 2008), and ritual areas (Du Plat Taylor 1957) at sites and on the regional level, suggests an increased emphasis on specialized activity areas which may have extended to ludic aspects of everyday life.

3. Feasting

While increasing architectural segmentation may have served to solidify or create new social boundaries, processes such as feasting may have encouraged a broader identity among participants, while at the same time building the prestige of the individuals or groups sponsoring the feast (Appadurai 2003: 21–5; Bray 2003: 94; Dietler and Hayden 2001; Pollack 2003; Rosenswig 2007: 5; Twiss 2008: 436), providing a venue for groups of people to engage in grounding in a visible setting amenable to attempts at manipulation of the semiotic contingency of games. The advent of plough agriculture, made possible by the introduction of cattle to be used as draft animals, as well as the arrival of screw horn goats on the island, allowed for increased agricultural production, and the accumulation of surplus foodstuffs provided the economic potential for large feasts (Knapp 1994: 69; 2008: 79; Manning 1993: 44; Swiny 1997: 196–7).

Evidence for feasting in PreBA Cyprus is most prominent in mortuary contexts. The use of large bowls and other specialized ceramic types, including elaborate, highly decorated vessels with scenes of communal activities and cattle symbolism were important parts of funerary feasting and display in PreBA Cyprus (Chovanec 2013: 45). Feasting was typically associated with elaborate tombs containing secondary burials, which could have been planned for long in advance. This allowed for sufficient accumulation of agricultural produce so that occasions would be used for competitive status displays to magnify and redefine the social importance of their ancestors (Keswani 2004: 82). At Lapithos *Vrysi tou Barba*, Tomb 806A, which contained a "massive accumulation" of 110 pots, was used for at least three to four burials, and produced a large number of cattle bones, likely the remnants of at least one funerary feast (Keswani 2004: 68). Large numbers of burned animal bones and "mouldered organic material" (Gjerstad *et al.* 1934: 416–8) along with large numbers of shallow bowls are likely the remnants of funerary feasting at the atypical burial tumuli at Korovia *Palaeoskoutella* (Keswani 2004: 48). At Deneia *Kafkalla*, elaborate Red Polished vessels are interpreted to have signaled community identity and the legitimization of the socio-economic position of certain lineages (Webb 2010: 174–9). While these cemeteries primarily date to the PreBA 2, new evidence from the PreBA 1 cemetery at Psematismenos *Trelloukas* suggests the consumption of food and drinks in connection with death and burial was important even in this earlier period, though on a smaller scale (Georgiou *et al.* 2011: 355; Webb *et al.* 2008: 93, 102).

Circumstantial evidence suggests that gaming might have played a part in such funerary feasts during the PreBA in Cyprus (Keswani 2004: 49). Game boards have been

found on the surface at Bellapais *Vounous* (Swiny 1986a: 35), Sotira *Kaminoudhia* (Swiny *et al.* 2003: 258), Psematismenos *Trelloukas*, Alambra *Mouttes* (Coleman *et al.* 1996: 175), and Marki *Kapparka* (Swiny 1986a: 36). Herscher (1998: 320) reports the discovery of *senet* and *mehen* patterns in the bedrock during a site tour at Deneia *Kafkalla,* but a comprehensive reexamination of the site only discovered one *senet* pattern (Frankel and Webb 2007: 149, David Frankel (personal communication)). Webb suggests this game was used for the recreation of the builders of the tombs there, but further work in cemetery contexts is needed to clarify the social context of these games found in cemeteries.

Evidence for feasting in settlement contexts is less obvious at PreBA sites, but this is likely due to the disparity in settlement sites excavated in comparison to cemeteries. Marki *Alonia* offers no obvious candidates for communal activity, and such spaces may lie outside the excavated portion of the settlement. Building IV at Alambra *Mouttes* differed noticeably in plan from the other buildings at the site (Coleman *et al.* 1996: 77), with a distinctively large hearth, a large concentration of burnt animal bones, along with more and better preserved ceramic vessels, including small bowls and juglets, than the rest of the site, indicating a space that served groups larger than a single family (Knapp 2013: 292).

At Sotira *Kaminoudhia,* two spaces, in particular, appear to have been non-domestic in nature and, indeed, may have been related to feasting. In Area C, Unit 2, a courtyard space approached through a vestibule, contained a large amount of ashy material and the remains of at least 92 small Red Polished bowls. Architectural features in this courtyard include benches along two walls, a hearth, a large stone threshold, and

interior walls covered in lime plaster (Swiny *et al*. 2003: 39–42, 87), differing sharply from typical architectural units at this site. The most distinctive structure at the site and, indeed, the most unique construction in PreBA Cyprus, is the so-called Unit 12 Complex in Area B. This large (80 m^2) unroofed structure was subdivided into four sections by low parapet walls and was entered through a large doorway opposite a 6 m high lime plastered wall supported by three large boulders (Swiny 2008: 50; Swiny *et al.* 2003: 34–7). An artifact assemblage atypical of the rest of the site was discovered within this complex, including large stone basins, a bench with saddle querns for grinding, eight games, a cattle scapula, and picrolite ornaments (Swiny et al. forthcoming). An unusual intra-settlement inhumation was found adjacent to the northern wall of this complex, further indicating the unique status of this structure within the social fabric of the community at *Kaminoudhia*. The atypical architecture of the building, the unique artifacts contained therein, and its large size suggest that it was used for "the performance of ceremonial activities and display, if not the consumption of food and drink" (Knapp 2013: 288), or even some type of communal cult activity (Swiny 2008: 50, forthcoming).

The large courtyards at Politiko *Troullia* may have produced evidence for communal activity, particularly in the southern courtyard, but the results of this excavation remain in the publication process and are, thus, not fully understood. A large concentration of Mesopotamian fallow deer bones was found in this courtyard, which may indicate some type of feasting activity (Falconer and Fall 2013: 114). Though the excavators discount the utility of limestone game boards as markers of repeated social practice (Falconer and Fall 2013: 113), it was in this southern courtyard that a large game board was imbedded into the floor surface (Falconer *et al.* in press). Coupled with the

apparent strong association of games with communal activities at Sotira *Kaminoudhia*, evidence at Politiko *Troullia* may suggest that feasting was also accompanied by gaming at this site, but complete publication of the site would be necessary to fully understand this relationship.

The small scale of settlement feasting suggests that it probably took place at the community level. Keswani suggests that the feasting associated with the extravagant burials on the north coast may have had inter-community involvement (Keswani 2004: 82). One exception to the small scale of settlement feasting could be that which took place at the Unit 12 complex at Sotira *Kaminoudhia,* where the incipient monumentality of this structure and its similarity to terracotta models known from the center of the island (Swiny 2008: 50), may indicate something on a larger scale.

Among the "public-inclusive" interactions described for the ProBA by Fisher in monumental structures at coastal sites, is the practice of non-mortuary feasting, which is more evident for the ProBA than it is for the PreBA. Evidence for feasting was particularly strong at Building X at Kalavasos *Ayios Dhimitrios*¸ where a central court and adjacent rooms produced evidence for the remains of a feast in the form of meat bearing bones and imported ceramics (Fisher 2009; 196–8, 201–2; South 1988: 227). Feasting appears to have been associated with ritual activity at Enkomi, where the Sanctuaries of the Horned God (Dikaios 1969: 194–9), the Ingot God (Webb 2001: 77–80), and the Double Goddess (Dikaios 1969: 199–200) all produced evidence for food preparation and consumption, likely in connection with the sacrifice of animals (Fisher 2009: 200–1; Knapp 2013: 372).

While feasting within settlements seems to have increased, there is less evidence for mortuary feasting during the ProBA, and burial grounds were no longer the preferred venue for the expression of social identity (Keswani 2004: 154–60; Knapp 2013: 382). While extramural inhumations organized into cemeteries were the predominant method of interment during the PreBA, cremations and inhumations in intramural graves (under the floors or streets of the settlement) were more common during the ProBA. This trend may reflect greater emphasis on association with certain lineages with social or political power than community inclusion (Knapp 2013: 381–2). Grave goods in ProBA cemeteries also tended to be more extravagant, often containing foreign elite materials and objects, disposed of as an act of conspicuous consumption to increase prestige (Keswani 2004: 85–7; 1996: 236–7; Steel 2004: 174).

Mortuary contexts from sites lower in the settlement hierarchy reflect practices more comparable to that known from the PreBA, with local ceramic types predominating and a few token instances of wealth or imported goods (Keswani 2004: 143), particularly Episkopi *Phaneromeni* (Carpenter 1981), Erimi *Laonin tou Porakou* (Bombardieri 2009: 286–8; 2010; 2012 59–61) Politiko *Lambertis* (Buchholz and Untiedt 1996: 71), Nicosia *Ayia Paraskevi* (Georgiou 2009), and Akhera *Çiflik Paradisi* (Karageorghis 1965).

Feasting equipment found in mortuary contexts suggests foreign influence on the drinking practices of the ProBA. Mycenaean chariot kraters and drinking sets are common among the mortuary accoutrements of coastal elites (Steel 1998: 294–6), and the distinctive decoration chosen on them, typically depicting women and chariots, may allude to their important role in funerary activity (Knapp 2013: 387). The adoption of foreign drinking practices (or the incorporation of foreign drinking equipment into

indigenous feasting practices) may have been accomplished through festivities involved in elite gift exchange, in which gifts were exchanged between Cypriot and mainland or Aegean elites (or their representatives), in monumental structures at coastal settlements (Steel 2013: 91). Indeed, Cypriots not only adopted the use of Mycenaean drinking sets, but they also may have adopted *marzihu* and *kipsum*, contemporary Syrian drinking practices (Steel 2013: 32–5). In this way, feasting was used more as a way for elites to solidify their status, again by incorporating esoteric knowledge of foreign customs.

Another type of esoteric knowledge that appeared during the ProBA was the Near Eastern game of twenty squares. Though this game has a long pedigree going back to the Royal Tombs at Ur, it first appeared on the island in the form of ivory game boxes, most famously known on the famous Enkomi game box (Fig. 5.2). It was found in a wealthy inhumation at that site (Murray *et al.* 1900), and other intact and fragmentary examples were also made of elite materials at coastal centers: two more at Enkomi (Dikaios 1969: 255; see Fig. 5.3), two at Hala Sultan Tekke (Åström 1984: 44; see Fig. 5.4; Niklasson 1983: 175–6; See Fig. 5.6), one at Morphou *Toumba tou Skourou* (Vermeule and Wolsky 1990: 221, 240, 332; see Fig. 5.5), and one at Kalavasos *Ayios Dhimitrios* (South 1996: 167). Evidence for the inclusion of this game in new feasting and drinking practices during the ProBA would suggest its use in the construction of elite identity, using it, in turn, as yet another form of foreign esoteric knowledge to reinforce the prestige of the players. On the other hand, the adaptation of Cypriot senet and/or mehen into these foreign practices would demonstrate their further hybridization of drinking and feasting. Furthermore, differences in the incorporation of games into feasting practices between the different settlement tiers could point to differential gaming practices meant to resist or

adapt to new socio-political realities on the island. This will be tested by looking for differences among the contexts in which games are found in each level of the settlement hierarchy.

4. Intra-Island Interaction

It is obvious that during the PreBA on Cyprus communities were interacting with one another, as can be seen through the exchange of ceramics, raw materials, and imports throughout the island. Different types of interactions are clear from the archaeological record on the island, and it led to a relatively uniform material culture throughout Cyprus but also with distinct local and regional patterning suggesting local identities and practices.

Perhaps the most obvious way in which communities interacted on Cyprus was through the exchange of materials, particularly copper and picrolite, which were not always locally available and had to be procured from sources in the interior of the island. Copper, in particular, featured prominently in the lavish burials of the PreBA north coast cemeteries at Lapithos *Vrysi tou Barba,* Bellapais *Vounous,* and Karmi *Palaealona* (Dikaios 1940; Dunn-Vaturi 2003; Keswani 2004: 67–71; Schaeffer 1936; Stewart and Stewart 1950; Swiny 1989: 27; Webb *et al.* 2009: 207–12). The Troodos Mountains in the center of the island are the only copper ore bearing geological formation on the island, and so copper must have been procured there. PreBA sites such as Ambelikou *Aletri*, Marki *Alonia*, and Politko *Troullia* are located near the ore sources in the Troodos and may have served some part in the procurement of copper ores, and residents of Politiko *Troullia* and Ambelikou *Aletri* may have played a role in the processing of ores

and manufacturing of objects (Falconer and Fall 2013; Frankel and Webb 2013). There must have been a considerable amount of interaction between those procuring and processing copper in the center of the island and coastal elites that used metal wealth in status building displays, particularly during mortuary feasting (Keswani 2004; 2005).

Though these types of interactions certainly were important for the formation of new social boundaries on the north coast of the island, they also extended to other parts of Cyprus where such socio-economic distinctions are less obvious. Sites near the coast in the south and western portions of the island have also produced copper artifacts from smaller scale mortuary tomb contexts as well as from settlements (e.g., Sotira *Kaminoudhia*). This indicates that these sites were also engaging with copper producing sites, if not producing copper themselves. These interactions were likely different in scale, if not in kind, than those between producers and north coast elite groups (Knapp 2013: 300–3; Swiny 2008: 49; Swiny *et al.* 2003: 391; Swiny and Mavromatis 2000: 435).

Picrolite, a more commonly used material in PreBA Cyprus, is a type of stone that also originates in the Troodos massif, though it was not exploited there. Rather, it was procured from the beds of rivers that carried pebbles of the stone to more easily accessible locations. Picrolite was a common choice for the manufacture of personal ornaments during the PreBA and was even more popular as a medium for the production of figurines during earlier periods. Intrinsic properties of the stone, namely its ability to absorb skin oils and change color through long-term wearing or use, likely gave the stone special meaning in prehistoric Cyprus (Swantek 2006: 6). It was most common in the south and west of the island, though it was also traded into the north, center, and east.

The Kouris River, which flows south out of the Troodos to the sea at Episkopi Bay, carried with it the bulk of the picrolite that was likely to have been used for the manufacture of objects in antiquity. The Karkotis River, which flows north out of the Troodos into Morphou Bay, also carries picrolite (Xenophontos 1991: 136–7), but it is of poor quality and does not produce pebbles of considerable size and uniformity necessary for the production of artifacts. Sotira *Kaminoudhia*, a short distance from the banks of the Kouris, has produced significant evidence for the production of picrolite objects in the form of flaked debitage, blanks, and unfinished artifacts (Swiny 2008: 47–8). This suggests that *Kaminoudhia* may have been a production center for these kinds of objects, which were then disseminated to the rest of the island through some type of exchange (Knapp 2013: 327-8; Swantek 2006: 124–34; Swiny *et al.* 2003: 237–8), though it may not be the only center of production and the distribution may not reflect organized top-down trade (Frankel and Webb 2006a: 243). Indeed, the importance of Sotira *Kaminoudhia* in the production and exchange of picrolite may have some import for the activities performed in the Unit 12 complex (Swantek 2006: 155–6). This unique complex of rooms produced an unusual concentration of artifacts, including games, and could have had implications for social complexity at the site.

Interregional trade on the island is also attested through the movement of ceramic vessels that have regional affinities. Drab Polished Blue Core ware, produced in the southwest of the island, traveled to sites in the center of the island, such as Marki *Alonia* (Frankel and Webb 2006a: 140). Other ceramic types, such as Brown Polished bottles found on the south coast, are imitations of northern types, Black Polished bottles in this case (Swiny *et al.* 2003: 152), and Red Polished South Coast wares known from the

Episkopi region, have also been found in the center of the island (Frankel and Webb 2006a: 137–8). This suggests an exchange in either the ceramics themselves or in the goods they contained, and recent chemical analysis of PreBA ceramics suggests these may have been aromatic substances (Chovanec 2013), and, thus, likely to have been suitable for exchange for other non-local products imbued with social meaning.

Frankel has attributed the spread of certain motifs in the White Painted pottery tradition during the PreBA 2 to women potters intermarrying outside their native communities (Frankel 1974, 1988). While the merits of this argument have been debated (Bolger 2003: 121; Knapp 2013: 324), it does illuminate inter-community marriage as a mechanism of cultural exchange that has not been emphasized in the study of the Cypriot Bronze Age.

Three mechanisms have been discussed, in some cases briefly, as ways in which Cypriots interacted outside of their immediate settlements during the PreBA: through exchange, by gathering for feasting, and through inter-community marriage. The concurrence of feasting with gaming has been discussed above, and the playing of games may also have occurred during exchange and marriage, functioning as vehicles for grounding, as ethnographic studies have shown the utility of games in initiating exchange relations as well as a traditional activity on the first night of marriage in order to acquaint the couple. Any evidence for a gaming component in the concomitant performance of exchange and marriage would help to explain the spread of *senet* and *mehen* throughout the island. Furthermore, the changes in these inter-community social transactions that are predicated by increasing social hierarchy would also change the ways games were used, either to subvert the effects of new social boundaries, or in response to them.

The increasing economic integration seen across the island during the ProBA brought Cypriots together in ways that were not possible in the PreBA cultural milieu. The growth of some coastal centers (Enkomi, Morphou *Toumba tou Skourou*, Kition and Hala Sultan Tekke) on the island was not likely due to natural population growth in those settlements alone, rather they are believed to have been new settlements, founded by people from surrounding communities in order to exploit access to the sea (Keswani 1996, 2004: 154–6). Differences in access to productive resources in these sites (perhaps due to familial relations in their ancestral villages?) fostered hierarchical social relations in these centers (Knapp 2013: 354). Other centers, founded during the thirteenth century BCE (Maa *Palaeokastro,* Pyla *Kokkinokremos,* and Episkopi *Bamboula*), may have functioned as outposts for nearby centers (Kouklia *Palaepaphos*, Kition, and Alassa respectively), maintaining close relationships with them (Bombardieri 2009: 288–9; Bombardieri *et al.* 2009: 117; Keswani 2004: 155; 2009: 123).

Despite the apparent connection between the large coastal sites and those in lower tiers of the settlement hierarchy scheme, there have been two competing factions among scholars regarding the socio-political structure on the island: those that advocate for a hierarchical system, with a polity controlled by elites centered at Enkomi during the ProBA 1 (Crewe 2007a; Merrillees 1982; Peltenburg 1996), followed by fragmentation of political authority during the ProBA 2 as a result of expansive growth in the other coastal sites (Knapp 1997: 66–8; Muhly 1989: 301–3; Negbi 2005; Peltenburg 1996), and those who advocate for heterarchical polities throughout the ProBA (Bolger 2003: 194; Keswani 1993; 1996; 2004: 154–5; Manning and DeMita 1997; South 2002). The actual nature of authority (or lack thereof) may be difficult to ascertain for such a complex

period with many mechanisms of interaction, alliance, and relationships in the social, religious, economic, and political spheres of life, and, indeed, political relationships may not even carry the most weight for change in gaming practices. It is unclear to what level political organization controlled other mechanisms of interaction on the island, and so it is more useful to examine those interactions for the purpose of studying gaming, rather than focus on determining the type of political entity(ies) that may have existed on Cyprus during the ProBA. It is possible that the types of organization would have an effect on the patterning of gaming, as they would entail different kinds of social boundaries between groups and individuals. Nevertheless, the purpose of this study is to examine whether that change exists in the sphere of gaming, rather than to identify nthe types of differentiation present.

Evidence for the lowest tier of settlement sites is just now coming to light, as archaeology had previously focused on the major settlements of the time period, but new excavations at Aredhiou *Vouppes* (Steel and McCarthy 2008) as well as incompletely published excavations from Episkopi *Phaneromeni* (Carpenter 1981; Swiny 1986) suggest that only sporadic imported or elite items trickled down through exchange to these sites. Though the types of ceramic wares differ and the scale of production activities is much greater than that of the PreBA, overall the material culture is remarkably similar to the previous period: agglutinative rectilinear architecture, reliance on chipped and ground stone tools, household level storage and agro-pastoral subsistence strategies. Though the sites were still connected into the intra-island and foreign networks of the time (Steel and McCartney 2008: 22), the number of imports is small and, at Aredhiou *Vouppes*, restricted to ceramic vessels (Steel and McCarthy 2008: 14). Indeed,

Aredhiou *Vouppes* and Episkopi *Phaneromeni* have together produced more games (43 in total) than all of the other ProBA sites combined, suggesting that these small agricultural and metallurgical support villages continued practicing more traditional forms of gaming than coastal Cypriots appear to have engaged in. This phenomenon could either be explained through the decreased impetus for inland Cypriots to emulate foreign practices and take on this type of esoteric knowledge, control over this esoteric knowledge elites, or through resistance to the changes that were occurring in the coast in reaction against increasing wealth disparity and social inequality. Whatever the case, there appear to be differences in the games Cypriots chose to play depending on where they lived in the settlement hierarchy, likely due to the types of social interactions they were navigating on a daily basis and also contingent on the necessities for the maintenance of their identities. Those living in the cosmopolitan centers on the coast, who were regularly interacting with people from the Levant, Aegean, Anatolia, and perhaps Mesopotamia and Egypt, lived in a different social milieu than those in the interior, and the choices they made to maintain these relationships by expressing a cosmopolitan identity were necessarily different than those of someone who rarely, if ever, interacted with someone from outside the island.

5. Foreign Interaction

The appearance of *senet* and *mehen* on Cyprus was the result of foreign interaction of some sort, and evidence from other types of material culture suggests that interaction with the mainland and the Aegean was more important than was previously understood. The consensus used to be that Cyprus only engaged sporadically in *ad hoc* interactions

with people from neighboring regions, with a trickle of imports appearing on the island, particularly in the north coast cemeteries. Reexamination of existing evidence, along with scientific analysis of metal artifacts, now suggests that Cyprus was engaged in a third millennium BCE interaction sphere, which encompassed the Aegean, Anatolia, and the Levant (Webb *et al.* 2006). These interactions had important implications for emergent social complexity, particularly in the north coast, where evidence for foreign contacts and evidence for wealth distinction is most common.

The strongest evidence for Cypriot engagement with the mainland lies in the results of lead isotope analysis of copper artifacts throughout the region, which point to Cypriot origins for some copper artifacts, and Anatolian or Aegean origins for some found on Cyprus (Webb *et al.* 2006). Indeed, Cypriot copper has been identified as far away as Pella in Jordan (Philip *et al.* 2003). Cuneiform tablets dating to the early second millennium BCE at Mari, Alalakh and Babylon discuss the acquisition of copper from "Alashiya," the Bronze Age toponym for the island (Knapp 1996b: 17–20). The Bronze Age saw for the first time the extensive exploitation of the island's copper resources, and it appears that copper was an important part of the exchanges in which Cypriots were engaged with foreigners. This exchange was likely focused on the north coast of the island, where the only evidence for coastal settlement exists (assuming the extensive cemeteries on the north coast were associated with nearby settlements). As mentioned above, the north coast was also the focal point of copper consumption for the purposes of mortuary feasting and display, and many have argued that there is a connection between foreign contacts in this region and the behaviors of emergent elites (Knapp 2013: 309–10; Merrillees 1977: 36). Whatever the case, it is clear that increased production and foreign

demand for copper was crucial for the intensification of interactions between Cyprus and neighboring regions during the PreBA 2, in particular.

Foreign goods were not restricted to the north coast, and some made their way to the center and south of the island, likely through exchange. Electrum in a pair of earrings found at Sotira *Kaminoudhia* (Swiny *et al.* 2003: 376–8) must have been imported to the island, as neither gold nor silver can be found on Cyprus. Other artifacts, such as shaft-hole axes of Levantine type, have been found in the Politiko region (Buchholz 1979; Knapp 2008: 308), as well as Mesopotamian cylinder seals and Levantine ceramics (Courtois 1986: 70–5; Knapp 1994: 281) that can be identified as imported to the island.

Manning (1993) suggests that intangible and esoteric knowledge (Wengrow 2009: 157–8) was also imported to the island at this time in the form of drinking practices that were incorporated into feasting and controlled by incipient elite groups. Gaming may have been another kind of esoteric knowledge that was brought to the island, specifically seen in the appearance of *senet*, which coincides with increased foreign contacts at the beginning of the PreBA 2. It is a type of knowledge that has a clear material component, i.e., a board with three rows of ten spaces (as well as playing pieces and, potentially, randomization devices; see Chapter VIII). Other types of esoteric knowledge, such as drinking practices, are more difficult to trace archaeologically, as they can be obscured by or adapted into indigenous forms of material culture, but the *senet* board is distinctive enough to signal a new kind of knowledge coming to the island at this time. What remains unclear is the way in which this knowledge was incorporated into the island, and if its esoteric, foreign nature had any import on the social contexts in which it was played.

Scholars have always recognized the dramatic increase of evidence for foreign interaction during the ProBA, due to intensified demand for and exploitation of the island's copper resources as the hallmark of the ProBA on Cyprus (Cline 1994; Laffineur and Greco 2005; Sherratt and Sherratt 1991). The system of interaction that Cypriots were participating in during this time, which extended from Sardinia to Mesopotamia, was "one of the most prominent and extensive systems of international trade known in a prehistoric setting" (Knapp 2013: 416). Goods of all types were exchanged, from the highest order luxury goods to raw materials and utilitarian items (Haldane 1993; Knapp 1991; Sherratt 2003).

The interaction was so frequent that it facilitated the development of an "International Style," a series of motifs displayed on ivory, gold, and silver objects that conveyed images of hunting prowess and mastery over nature that reinforced a shared cultural milieu among the elites of the Aegean, Cyprus, and the Levant, in particular (Caubet 1998; Feldman 2002; 2006; Feldman and Sauvage 2010; Steel 2013). Elites between regions interacted with each other on a formal basis, maintaining political alliances (and in some cases demonstrating subservience) to other regional powers through the exchange of greeting gifts, as evidenced by the correspondence in the Amarna Letters between Pharaoh Amenhotep III of Egypt and his Levantine, Cypriot, Anatolian, and Mesopotamian counterparts (Moran 1992). Exchange was not limited to the realm of diplomacy, and there is evidence for widespread mercantile activity, most dramatically seen in the Uluburun shipwreck off the southern coast of Anatolia (Pulak 2001; 2008: 290–7).

All of this activity led to a high degree of "connectivity," that is, the "social and geographical interdependence of small-scale, locally specific phenomena (including micro-regions, places, peoples, economic strategies, and interactions) within a dynamic network of relations enjoyed by them with the wider world" (Skeates 2009:556). The identities and social structures of the elites of the Eastern Mediterranean world during the ProBA were dependent on the perpetuation of this system in order to maintain their status in the coastal centers.

Hybridization of foreign motifs and technologies were a crucial strategy of coastal elites on Cyprus in building and maintaining their status (Voskos and Knapp 2008: 664–73), as these new symbols were incorporated into existing ideological systems in order to have greater meaning. On the coast, Cypriots belonging to wealthy and powerful lineages were able to wield the esoteric knowledge exhibited in luxury imported goods, exotic drinking rituals, and new self-aggrandizing iconographies, in order to signal to foreigners that they were a part of this system, while at the same time augmenting their status among the local population through conspicuous consumption.

In the lower tier settlements on the island, however, these items may not have held the same meaning. The appearance of sporadic imports by individuals in these settlements may not signal that they themselves held significant status. The social biographies of such objects of foreign origin (Appadurai 1986) have not been adequately considered, particularly in these smaller settlements, and their localized contexts of consumption and relative values (Manning and Hulin 2005: 271) likely were not the same as those in the coastal centers, due to the different social realities. Many possibilities exist, whereby individual elite objects may have conveyed greater social status to people in the

lower tiered sites than in coastal centers, or they might have held less meaning because they were outside a context in which they held meaning.

The game of twenty squares, introduced during this time, appears to have been a key part of the elite gift exchange among ruling elites in the Eastern Mediterranean, and those in Cyprus do not appear to be an exception, since the game boxes from Enkomi are decorated in the International Style (Crist *et al.* 2016a: 189). It does appear that the game was not solely an item of gift exchange, as more crudely fashioned examples of the game are known from Hala Sultan Tekke and Kouklia *Skales* (Åström 1984; Karageorghis 1983: 122). Considering the aforementioned relative absence of *senet* and *mehen* from coastal settlements during the ProBA, one might suggest that this pattern is related to the new cultural milieu that existed in the coastal settlements. This situation may have been prohibitive for the playing of traditionally Cypriot games (*senet* and *mehen* having bevome indigenized at some point during the PreBA) in the kinds of structures that provide the bulk of the coastal settlement evidence for the period (i.e., large-scale monumental structures). Were the coastal elites actively avoiding *senet* and *mehen* as social markers of a more traditional way of life on the island, opting instead for the more cosmopolitan game of twenty squares, to demonstrate their understanding of this type of esoteric knowledge? A pattern such as this may indicate that Cypriots on the coast harnessed play activities to signal connectedness with the outside world and the higher status that came with it, and others in the same towns similarly avoided more traditional games because they were conscious of the more traditional connotations they may have had. The use of a game to convey this information, especially considering the importance of the performance of play, may have been a particularly effective method for

constructing elite identity by signaling individuals' ability to engage with esoteric knowledge in the form of the game of twenty squares, and, thus, their placement within the shared cultural milieu of the Late Bronze Age Eastern Mediterranean.

6. Summary of Changes in Bronze Age Cyprus

The four processes discussed above do not represent the full suite of changes that were seen during the PreBA of Cyprus, but they are the four that are likely to have had the most visible impact on the archaeological record of gaming on the island. Far from being separate processes, the redefinition of space, gathering of people for feasting events, intra-island and foreign interactions all affected each other in turn. The production and exchange of copper on the island certainly played an important role in the reorganization of exchange networks on the island, though it is impossible to tell whether it was spurred by foreign interaction, or if foreign demand for Cypriot copper increased because these networks were already in place. The reorientation of such networks led to changes in inter-community relations, which likely changed the types of possible relationships among certain communities.

The practice of feasting also became crucially important to the construction of community and elite identity on Cyprus during this period, and it incorporated the products of exchange in picrolite, copper, and foreign interaction in its displays of material wealth. Feasting did exist in Chalcolithic Cyprus (Keswani 1994: 266; Peltenburg 1985: 116–8), but it is again not clear whether the feasting practices of the Bronze Age are derived from earlier practices and changed due to increased metal and agricultural wealth, or if the feasting itself spurred increased production. The

organization of space also may have come about in response to changing intra-community social interactions, though a cause and effect relationship is not always clear. Rather, it seems that all of these practices are entangled with one another, and changes occurring in one process also brought about changes in the others. This system of entanglements remained the status quo on the island until the beginning of the Protohistoric Bronze Age, at which point new types of interactions both within and outside of Cyprus brought about new social realities that further increased socio-economic inequality on the island.

The impetus for all of the changes and types of social interaction that took place during the ProBA was the changing level of interaction between Cyprus and the rest of the Eastern Mediterranean world, which crossed a threshold at the beginning of the period and accelerated throughout, until the entire regional system collapsed around 1050 BCE and brought dramatic change to most of the cultures involved in it. Cyprus' entanglement in the exchange networks of the period led to the redefinition of identities and drew people from different communities to live together in new settlements from which they would be better able to participate in these exchange networks. Some lineages were more successful than others, perhaps due to ancestral ties to areas that had better access to valuable agricultural or mineral resources, which through time led to increased disparity in wealth, prestige, and, ultimately, power. It redefined the spatial organization of the settlements in which people lived and the organization of settlement throughout the entire island, while new materialities were incorporated into existing practices of feasting and drinking, modified to display knowledge of exotic practices. The entire structure of interactions that were possible between communities changed, as the procurement and

processing of copper and other goods for exchange were dependent on the movement of raw materials and manufactured artifacts from the interior to the coast.

The importance of all of these processes for the changing contexts of gaming with respect to increasing social complexity is in how the interactions and entanglements that are associated with games changed as Cyprus transitioned from a small-scale village-based society into one with clear manifestations of socio-economic complexity. The social and physical construction of space is very important to the playing of games, as the spaces deemed appropriate for game play are highly culturally specific and variable. Feasting and drinking occasions, as events in which individuals and communities actively engage with their identities and serve to solidify them in some ways, but change them in others, are also often accompanied by games, which can provide a liminal activity through which interaction outside cultural norms and grounding can occur. Such gatherings also provide an ideal setting in which to engage with semiotic contingency in a public and visible setting. Changes in the way games are incorporated in feasts may demonstrate either more formalization of such feasts through the exclusion of games (whereby social interaction is limited and the feast itself is more of a demonstration of wealth), or more inclusiveness and the encouragement of more interaction across social boundaries.

Games are an effective method by which people initiate and develop new social and economic relationships, and they may have been used to foster interactions with people outside the community, neighborhood, or ancestral group through grounding. Because of the reorganization of inter-community interaction, brought on by population movement and increase and the intensification of raw material exploitation and transport

seen during ProBA Cyprus, people were coming into contact more frequently with individuals from other regions of the island than they did during the PreBA, and, thus, the need to initiate new relationships was greater.

Finally, changes in extra-island interactions brought new games to the island but also new possibilities for play. Not only was it now necessary for those on the coast looking to benefit from foreign exchange to interact with people from disparate regions, their new social realities required them to break from the entanglements of traditional Cypriot practices in some ways, while incorporating new forms of material culture and intangible knowledge into existing practices. The newly introduced game of twenty squares offered one possibility for Cypriots navigating this new trans-Mediterranean cultural milieu, but *senet* and *mehen* may have offered an alternative to those resisting the new socio-political reality on the island. Alternatively, those who did not have access to that specific type of knowledge but wished to emulate it using more readily available cultural knowledge could have played them in similar contexts to twenty squares.

The long-term perspective envisioned here seeks to investigate gaming in the light of these changing processes over the course of roughly 1500 years. While it is likely that social context of games varied markedly over time and space on Bronze Age Cyprus, the identification of long term trends in the changes in the spaces, occasions, and concomitant activities associated with gaming with respect to other social processes will help to increase understanding of the intersection of the ludic sphere of human activity with other, more comprehensively studied aspects of culture.

Chapter VI: Methodology

1. Establishing Goals

To pursue an analysis of long-term changes in gaming practices in Bronze Age Cyprus, a research program emphasizing the spaces of gaming and other artifacts in those same spaces is necessary. It is necessary to investigate these lines of evidence for the purpose of determining changes that gaming practices may have had on the development of complex society and vice versa. To attain the ultimate goal of contextual analysis of these artifacts, four stages of data collection and analysis were required: standardization of data compilation on games, identification of places in which games were played, collection of contextual data, and Correspondence Analysis (CA) of the contextual information to discover clustering in the data. Each of these steps was necessary to construct a dataset that would allow for meaningful interpretation of disparate data, allowing for interpretation of the results presented by the CA.

Correspondence Analysis: Correspondence Analysis is a multivariate statistical technique that enables one to obtain a graphical view of the structure of a two-way contingency table (Baxter 2003: 137) by displaying the rows and columns in a two-dimensional graph (Greenacre 1981: 119). It is a technique that can be used for any case when looking for patterning in abundance or presence/absence data common to archaeology (Shennan 1997: 308).

A relatively recently developed method, CA was developed in France by Benzécri (1973) and began to be used by archaeologists in the 1980s, particularly in Scandinavia

where archaeologists have used CA to explore many sites and research questions (Bølviken *et al.* 1982; Madsen 1988). It has been more slowly adopted into Anglo-American archaeological research than elsewhere (Baxter 1994: 101) but has gained acceptance since the 1990s as a strong technique appropriate for certain questions.

Perhaps the most common application of CA to archaeological data is for seriation. Its utility in ordering sites based on counts of different ceramic styles has been shown many times and is a relatively easy way to deduce chronological patterning (Bech 1988; Holm-Olsen 1988). When a clear chronological trend is apparent, CA produces a characteristic parabolic plot ordering the sites in question.

Another popular, though less commonly used application for CA is for identifying patterning in assemblages from archaeological sites. This has been performed at sites where artifact counts can be made for discrete units of analysis, such as graves, hoards, or architectural spaces, to determine differences in the deposition of artifacts in those spaces, which may be the result of function, gender differences, or other factors (Clouse 1999; Alberti 2013; Shennan 1997: 327–341; Nielsen 1988).

For the purpose of determining patterning in practices associated with gaming in Bronze Age Cyprus, the two studies most pertinent to model the study after are those by Clouse (1999) and Alberti (2013). In both of these case studies, the researchers used data from settlement contexts to determine the use of different architectural units. Alberti examined artifact assemblages from Middle Bronze Age huts at the site of Punta Milazzese on the Aeolian island of Panarea in the Tyrrhenian Sea. He compiled counts of artifacts in a 31x19 contingency table, tabulating the frequency of objects with known function against the huts in which they were found. CA was performed on this table,

producing a two-way plot displaying the distance between points and a table displaying the row contributions to the total amount of inertia in the dataset.

Because CA is a multivariate method, the results produce multiple axes along which variation occurs, but generally only the first two to four axes offer any kind of interpretable results, contingent on the analyst's ability to provide meaningful interpretation to those axes (Alberti 2013: 486; Benzécri 1992: 398; Clausen 1998: 25; Yelland 2010: 13). The dimensions are displayed by the descending amount of inertia contained within the dimension, i.e., the first dimension contains the most inertia, followed by the second dimension with less, and so forth. Each dimension can be used as an axis on a two-way plot, and they can be interchanged and plotted against each other in order to better visualize the patterning in the data.

A separate table produced by the CA includes the inertia values for each row in the contingency table. The inertia values displayed in this table show which artifact types contributed the most toward the patterning in the data for each of the dimensions and are important for interpretation of what each dimension represents archaeologically. The results of Alberti's analysis showed that the first dimension was mainly determined by an opposition of storage and processing artifacts versus artifacts related to consumption. The second dimension was more contingent on the presence of production tools.

Upon determining the "meaning" of those dimensions, an interpretation of the plot, with the first and second dimensions represented by the x and y axes is easier to achieve. In such a plot, both the row values (artifact types) and contexts are plotted in the same space, and the distance between two points is a graphical representation of the difference between them. Therefore, points which are closer together on the plot can be

interpreted as having similar values according to the dimensions on the plot, and thus, representing similar archaeological contexts (and by extension, activities in those spaces). The identification of clusters on the graph can lead to further interpretation of the assemblages contained therein and allow for inferences on the types of activities that took place in certain spaces.

Clouse (1999) took a very similar approach to the analysis of data at nineteenth century CE Fort Snelling, Minnesota. With the large range of artifact types recovered at a historical site, Clouse condensed the data into analytical categories based on the function of the artifacts. Examples of these functional groups include culinary, personal hygiene, transport, commerce, and leisure (Clouse 1999: 93). In addition to performing CA on the full suite of contexts at Fort Snelling, he also performed CA separately on different groups of contexts (defensive, habitation, support), to determine what functional types were more closely associated with those types of spaces. Clouse was able to determine that the leisure group of artifacts (which included games) was closely associated with officers' quarters and commanding officers' quarters based on the distance between points on the CA plot (Clouse 1999: 102).

Using these studies as examples of the ways CA can be used to interpret settlement data, Bronze Age Cypriot contexts that have produced games will be analyzed similarly in order to determine patterning in the data, which is expected to reflect the different types of activities associated with gaming. Before this analysis could be performed, it was necessary to compile and format the data according to the requirements of CA to produce meaningful results.

Compiling and Formatting the Data: To be able to perform CA, data needed to be collected on the games themselves and the contexts in which they were found. Four stages of data compilation and analysis were identified: Standardization of data on games; identification of gaming spaces; collection and formatting of contextual data; and performing the CA.

The first stage of the process, standardization of the data collection on games, was required by the *ad hoc* manner in which data on game boards were collected by various excavations since Swiny's first identification. Though many of the games under consideration for this research have already been published, the same information was not collected by all excavators, leaving lacunae in the data necessary to discuss the artifacts comprehensively, and, in some cases, to identify which game was represented. Therefore, the games had to be located in the museums in which they were housed and reevaluated using a standardized set of data points to identify and describe them comprehensively.

The next step necessary to prepare for CA was to identify discrete spaces that could be used for the analysis, most broadly those architectural units in which games were found. To identify variation in the types of spaces these were in relation to gaming, it was important to discover spaces in which people gathered to play games and identify other spaces in which games were found, but perhaps not played. A pilot study at Sotira *Kaminoudhia* was conducted, since this site had the greatest number of games and also had a variety of domestic, communal, and production areas. The results of this pilot study led to the conclusion that spaces in which multiple games were found were likely to be

places people gathered to play (Crist in press). Mulvin and Sidebotham (2004), furthermore, suggest a distinction between portable and immobile games, which was applied as another criterion to identify spaces intended for gaming.

Once these spaces were identified, the next step was to gather the contextual data into a two-way contingency table necessary for CA, using already published data for some sites and unpublished data for others. Counts for different artifact types were compiled and then grouped to produce meaningful categories for CA. Variations in recording styles between excavators, as well as differences in the classes of artifacts that were collected were accounted for in structuring the data.

Finally, with the data collection completed, CA was performed on the table of artifacts found with games in order to produce a plot of the two variables most responsible for the variation in the data, represented as a scatter plot on two axes, with each axis being one of the major variables. Both the contexts themselves and the artifact classes are presented in CA, showing patterning in the different architectural units that are most similar to each other, as well as the artifacts which are most associated for those groupings. The CA was performed for PreBA and ProBA contexts separately, as a result of differences in data that were available for PreBA and ProBA sites (specifics are discussed in Chapter VII). These approaches still allow for the examination of patterns changing through time (when comparing the results of the PreBA and ProBA plots to one another) and differences in practices between individual sites within time periods (comparing the differences between spaces within each plot).

2. Standardization of Data

Before collecting data for CA, a comprehensive database of all the known games excavated from sites on the island needed to be compiled, so that patterns within the corpus could be understood in terms of patterns in manufacture and deposition pertinent to the identification of gaming spaces.

The only comprehensive examination of gaming material on the island, Swiny's compilation of the material from Episkopi *Phaneromeni* (Swiny 1986a), provided some basis for the analysis of the material. The games were classified into two types: *senet* and *mehen*, based on the layout of depressions that were present on the stones. Measurements of the stones were taken of the length, width, and depth of the individual stones, and the number of preserved depressions counted. In some cases, subsequent scholars cataloguing these artifacts noted the diameter and depths of the depressions, but not for all examples. Length and width of the field of depressions was also noted in some cases but not others. The presence of auxiliary features, such as larger depressions adjacent to the main pattern were also identified, but their position relative to the main pattern was not always indicated. The *senet* corpus was originally divided into Types 1 and 2, based on the size of the pattern of depressions (Swiny 1986a: 32–4), but this division was arbitrary and is no longer utilized (Swiny *et al.* 2003: 231). Other excavation reports demonstrate similar inconsistencies in cataloguing the material, in some cases without basic information such as what pattern of depressions is present, the number of depressions preserved, or whether the artifact is intact or broken.

To standardize the dataset, the data already compiled in excavation reports of Bronze Age sites were gathered and put into one comprehensive database

(https://dataverse.harvard.edu/dataverse/cyprusgames), with all of the different data points used by the excavators as categories for analysis. In all, 38 sites with published games were identified (Table VI.1) with varying degrees of cataloguing. Some publications merely mentioned the number of games found at a site, while others offered relatively comprehensive measurement and description. Most of the data were converted from textual descriptions in the relevant publications to categorical data in a Microsoft Excel spreadsheet in order to facilitate further analysis, while some of the information available from Marki *Alonia* was imported from the finds database supplied on a DVD with the latest publication of the site (Frankel and Webb 2006a).

Once the data were converted into a database, the number of lacunae present demonstrated the necessity for examination of as many of the games as could be located, prioritizing those which came from stratified archaeological deposits and which represented all chronological stages of the Bronze Age. In all, twelve sites were prioritized for analysis based on the known presence of games discovered during excavation: Sotira *Kaminoudhia* (Swiny *et al.* 2003), Episkopi *Phaneromeni* (Swiny 1986a), Marki *Alonia* (Frankel and Webb 1996; 2006a), Alambra *Mouttes* (Coleman *et al.* 1996), Maa *Palaeokastro* (Karageoghis and Demas 1988), Pyla *Kokkinokremos* (Karageorghis and Demas 1984), Maroni *Vournes,* Maroni *Tsaroukkas,* Kissonerga *Skalia*, Episkopi *Bamboula,* Hala Sultan Tekke (Åström 1984), and Kalavassos *Ayios Dhimitrios* (see Table VI.2 for chronology). Games found in surface deposits were also examined, but an attempt was not made to locate all of them due to time constraints and the value they added to this study, since they have no archaeological context to include in the CA. Most of the surface games that were examined came from the Episkopi Area

Survey (Swiny 1981), the Vasilikos Valley Project (Todd 1993), and the Maroni Valley Archaeological Survey Project.

Once permission was obtained from the Department of Antiquities of the Republic of Cyprus and the excavators of each site, the gaming material from each of the twelve sites (along with what survey material was available) was located in the museums or excavation storerooms in which it was stored (Table VI.3). Once located, each of the lacunae in the database was addressed. Weight, a major category for determining portability and, thus, gaming spaces (see below), was measured using a digital hanging scale. Reference photos were also taken of all of the games that were analyzed and included in the database. Further qualitative notes were added which would help in the interpretation of the games, such as the quality of manufacture or the state of preservation of the artifacts.

3. Identifying Gaming Spaces

Once a standardized database was compiled, it was necessary to determine what spaces were places in which gaming took place. The identification of discrete contextual units is important for the performance of CA, which requires counts of artifacts from the same context to produce interpretable results. Since many of the games found on Cyprus were small enough in size and light enough in weight to be carried, the simple presence of a game in a space does not necessarily imply that it was played there. The identification of places meant for gaming was made based on the presence of games incorporated into architectural features, multiple games in the same space, and heavy games unlikely to have been moved frequently.

The concept of a game context (Crist *et al*. 2016a), defined in its most obvious incarnation as a bedrock outcrop or artificial pavement into which multiple games have been scratched or pecked, is useful for the identification of places in which games were played. The games themselves cannot be moved, and often many games are accumulated in the same spot, demonstrating that it is a place where multiple people gathered over time. Furthermore, the placement of the games in game contexts is often such that it is unlikely that one game was played concurrently with a neighboring pattern, indicating that the same place was used for gaming on multiple occasions. This can also be demonstrated by the presence of anachronous games in the same game context.

Immobile games have been noted and identified by Mulvin and Sidebotham at the Roman fortress at Abu Sha'ar in Egypt, which they call "purpose-built" games, found on stone benches and thresholds throughout the fortress (Mulvin and Sidebotham 2004: 613–5). Swiny noted games on thresholds and benches at Bronze Age sites in Cyprus (Swiny 1986a: 34), and subsequent excavations have found them on steps, thresholds, benches, or set into floors. Such places are easy to identify as places where people played games due to the obvious immobility of the patterns of gaming.

One of the rooms at Abu Sha'ar, likely a mess hall for soldiers, contained the majority of the evidence for gaming at the site. In addition to the presence of games on stone benches in this room, multiple portable games were found in the same location, indicating that this was a place where people gathered to play games, leading the excavators to call the space a "gaming room" (Mulvin and Sidebotham 2004: 614–5). Building from this example, a pilot study was done at the site of Sotira *Kaminoudhia,* the site that has produced the largest number of games on the island (Crist in press). In this

study, the number of games found within each architectural unit was counted and compared to the excavator's interpretation of the function of those spaces. Domestic contexts produced one game per unit, and, indeed, only one game was found per group of interconnecting units, perhaps identifiable as a household. Some contexts did produce multiple games and they were identified by Swiny as spaces in which communal activities took place (e.g., eating and drinking) and were often large, open air courtyards with white plastered wall surfaces (Swiny *et al.* 2003: 37, 40–1; 2008: 48–50). Therefore, the social context of games, at least at this site, appears to be different where multiple games were present in comparison to where single games were found. This conclusion brings further import to the identification of gaming spaces as places where particular kinds of social action influencing or being influenced by changing social boundaries took place.

Another method to identify spaces intended for gaming, not discussed by Mulvin and Sidebotham in their analysis of games, is the presence of immobile games that are not pecked or etched into architectural or natural surfaces, but which are manufactured objects in their own right. One might conceptualize these objects as similar to modern gaming tables: an object solely for the purpose of gaming, but with a fixed location. The range in size of the games is suggestive that they were not all meant to be carried, as some are over a meter in length while others fit in the palm of one's hand. Plentiful, locally available stone was used for the manufacture of these games, and there were not likely to have been limited options with regard to the size of stones available. This suggests that Bronze Age Cypriots were choosing certain sizes of stones for certain purposes: some to be carried and some to be permanent fixtures.

The portability of stone has been the subject of a number of studies, mostly pertaining to the procurement of raw materials for the manufacture of lithics and other stone objects (Close 1996; Lurie 1989:47; Hayden 1989: 8; Kuhn 1994). These studies found that significant weight of stone could be carried from stone sources to manufacturing sites, particularly with the use of pack animals. Such examinations do not offer much in the way of interpreting the intended use of manufactured items, since it describes behavior for the procurement of scarce materials rather than the intra-site transport of artifacts.

Rather than predetermining a cutoff weight for portable versus immobile games based on the behaviors of resource procurers, a better method for determining the portability of games is to compile the weights of as large a sample of the Cypriot corpus that is available, and to look for patterns in the assemblage to see if the games could be grouped in a coherent way based on their weight. Because of the remarkable regularity in the patterning of depressions on the games (three rows of ten or a spiral), it was possible to offer a more complete sample by considering the original weight of fragmentary games. This was achieved by calculating the percentage of the *senet* or *mehen* pattern that remains based on the number of depressions or percentage of the spiral preserved, respectively, and dividing the measured weight by that percentage to obtain the reconstructed weight.

Using the location of permanent, immobile, and clusters of games to indicate that certain spaces were places where people came to play games, it can then be inferred that other activities taking place in those spaces happened concurrently with game play, or at least were acceptable practices to be shared in that type of space. The types of activities

associated with gaming are expected to change as social complexity increases and people adapt to the changing social landscape and effect change, in turn.

4. Gathering Contextual Data

With gaming spaces identified, the collection of contextual data, i.e., other artifacts found in the same spaces as games, was necessary to perform CA and determine patterning in the types of activities associated with gaming. Using each architectural space as a discrete unit for analysis allows for the comparison of the assemblages contained therein. To collect these data, a new database was constructed (see Appendix B) tabulating counts of individual artifact classes contained within each space, as required for CA (Shennan 1997: 308).

Data were collected from excavation reports and field notes, based on the status of publication for each site. Most of the sites had already been completely published at the time of the study, with the exception of Episkopi *Phaneromeni,* the material from the 2001–2004 excavations at Sotira *Kaminoudhia*, and Maroni *Tsaroukkas.* For Episkopi *Phaneromeni* and Sotira *Kaminoudhia*, artifact counts were obtained by consulting field excavation notes and early publication drafts (Swiny n.d.; forthcoming), while contextual data for Maronni *Tsaroukkas* was communicated by the excavation team (David Sewell, email dated 2/5/2013). For the remaining sites, this information was obtained through the consultation of excavation reports.

The types of data contained within these excavation reports was not always consistent, or readily available, and would lead to the differential use of the data in CA. For example, some of the sites taken under consideration (Maroni *Tsaroukkas,* Episkopi

Phaneromeni, Maa *Palaeokastro*, Pyla *Kokkinokremos*, and Morphou *Toumba tou Skourou*) did not have sherd count data available, so only complete or nearly complete vessels were counted. Only one site, Marki *Alonia,* published raw data for the findspots of faunal remains and chipped stone artifacts, while the other sites discussed those artifact classes in a more general manner. Ground stone, personal ornaments, metal objects and architectural features were all consistently included at all of the sites under study.

Presentation of the data in publication was generally consistent within time periods. PreBA site publications generally presented a more complete set of data than the ProBA sites. Because the ProBA sites were consistently the ones that did not include sherd data, but the PreBA sites did include sherd counts, it was possible to compare sites within a time period more comprehensively. Despite the unavailable data from ProBA sites, it would still be possible to make some conclusions between time periods based on the patterning of artifacts that were available.

It is also important to note that data were collected from spaces that contained portable games as well as from gaming spaces. While gaming spaces are not, necessarily, functionally different from spaces that contained gaming stones, performing CA on the full suite of spaces in which games were found would allow for comparisons between spaces where games were found but not necessarily played and gaming spaces. This could then reaffirm the suggestion that the places identified as gaming spaces can, in fact, be distinguished from other spaces based on the activities found there.

Collecting the raw data of counts of artifacts produces a large number of columns with very few counts, which can be used for CA but is not an ideal dataset. To produce better results, a dataset containing fewer columns with greater numbers of counts

contained therein is preferred. Thus, after the data were collected, it was necessary to combine artifact classes into broader analytical categories that would produce a more meaningful output from the CA. To achieve this, multiple permutations were attempted, grouping the data into different schemes of categories, and that which produced the most meaningful result in CA were used for interpretation of the data.

5. Correspondence Analysis

To perform the CA, two different statistical packages were used to achieve the necessary results for a full interpretation of the data. To produce the main two-way plot of the data and to examine the inertia values for row and column data, the context databases were imported into MYSTAT 12.02.00 to perform CA. Because MYSTAT only produces a plot of the first two dimensions calculated by CA, the context databases were imported into Paleontological Statistics Version 3.0 (PAST 3.0), which was used to create plots involving the third and fourth dimensions, in order to determine if they offered any interpretable results.

Based on the types of contextual data available, it was immediately obvious that the most fruitful way to perform CA was to compare PreBA sites with other PreBA sites, and ProBA sites to other ProBA sites. Thus, the contextual data for PreBA sites and for ProBA sites were gathered together into separate databases and CA performed individually for each time period. This analysis would help determine patterning in the types of activities associated with gaming in the smaller scale society of the PreBA and comparing it to the results obtained from the socially complex ProBA sites would show

how people were negotiating this new social reality differently from that which came before.

CA was also performed on the entire database, with the ceramic evidence not included, in order to determine if there was any patterning in the data available for both PreBA and ProBA contexts that might allow for better comparison between the periods, since the interpretation of the CA for PreBA sites might privilege ceramic data due to their abundance.

To interpret the data, criteria other than those represented in the database were also taken into consideration. Aspects relating to the types of spaces, as well as the games found in those spaces were taken into account in order to more fully interpret the plots. For instance, it is important to take into consideration the patterning in the types of spaces (open-air, roofed, permanent or multiple games, single games) on the plot and not only their relationship with the artifact classes with which they are most closely associated. Furthermore, it is also important to note which contexts contained intact games, which contained fragmentary games, and which game(s) was contained in each space in order to determine depositional patterns as well as potentially different social contexts for *senet* and *mehen* at these sites. To do this, the points for each of the spaces included in the CA would be represented on each of the plots differently (i.e., through shape and color) to reflect the presence or absence of these traits and to allow for a more complete interpretation of what the data represent.

Once these plots were produced, interpretation of the results in light of social complexity could begin, allowing for the discussion of the role of gaming in the construction of identity and the ways in which it facilitated interaction among the

changing social landscape as social complexity increased. CA alone cannot provide all of the answers to the questions under consideration for this study, but rather it serves as a tool through which patterning can be more readily seen and interpreted in the light of relevant social processes discussed in Chapter V.

Chapter VII: Results

1. Data Collection on Games

In all, 230 games were located, measured, and analyzed for the purposes of this study, representing 26 sites dating to all phases of the Bronze Age (see table VI.1, VI.2), representing 54.2% of the total number of Cypriot games (n=424), and 46.4% of the sites that have produced games (n=56). Of those examined, 92 were from excavated contexts (59.3% of the total excavated: 155), while 138 were from surface deposits (51.3% of all surface finds: 269)[2]. The counts indicated here account for those games for which data were collected *in toto*, partial data were also compiled on other games as available, sometimes limited by the current location of the game, as many were built into ancient walls and remain *in situ*, and sometimes limited by access due to the political situation on the island and unavailability of unpublished material.

Identifying Types: The patterning of the number of depressions found on the stones discussed in Chapter IV bears repeating here: 99 intact Bronze Age artifacts (see Fig. IV.5) display a *senet* pattern, while 139 fragmentary artifacts displayed three rows of depressions and likely also were *senet* games, since only four artifacts in the entire corpus of rectilinear games display more than ten depressions in a row. The *mehen* game is also well represented in the corpus, with 23 intact examples and eighteen fragmentary games.

Of the other patterns that recur, the most common is that of four rows of ten, which has been called a variation of *senet* particularly popular in the Maroni region

[2] Included in the totals are 24 games from five Iron Age sites that are outside the scope of this research, but, nevertheless, included in the database to be as comprehensive as possible.

(Swiny 1986a: 40). That suggestion is supported by this study, as four are known from Maroni *Vournes* that definitively display four rows of holes (Figure VII.1), while another was found at Marki *Alonia*, though that one was in a poor state of preservation and may not depict the same game as the Maroni examples. The only other repeating pattern of depressions is a circle of ten depressions, with one example from Maroni *Tsaroukkas* (MT.722) and another from Episkopi *Bamboula* (10416, Figure VII.2). A fragmentary game from Hala Sultan Tekke (G1, Fig. V.4) displays half of a circle with six depressions preserved, and it is likely that it once contained a total of ten to twelve depressions arrayed in a circle. As discussed in Chapter IV, this game may be an example of the Minoan game "10-ring" or "12-ring" (Hillbom 2011: 110–1).

On the same artifact, a fragmentary pattern of what may be the Near Eastern game of twenty squares appears, displayed as a series of incised squares. This game is known in at least six other examples from Cyprus, with three examples in ivory inlay from Enkomi and three inscribed on a stone from Tomb 69 at the Iron Age cemetery Kouklia *Skales* (Karageorghis 1983: 122, Plate 90.). No examples are known from Cyprus in which the pattern was laid out in a series of depressions and, indeed, such a configuration of cup holes is only rarely known from the Near East (Fugmann 1958: 238). Likewise, the game of twenty squares is the only game known from Bronze Age Cyprus that appears with square playing spaces. Even *senet*, which commonly has square playing spaces in Egypt and the Near East, is always represented as a series of depressions on Bronze Age Cyprus—an example with incised squares found at Iron Age Koulklia *Skales* (Game A from Tomb 69, Karageorghis 1983: 122, Pl. XC) probably points to a later reintroduction. This may indicate that two incomplete sets of square inlays found in

tombs at Morphou *Toumba tou Skourou* and Kalavasos *Ayios Dhimitrios* likely were once part of game boxes (Vermeule and Wolsky: 240; South 1996: 167) displaying the game of twenty squares.

Other patterns of depressions found on Cyprus appear only once and cannot be identified definitively as a type of game or some other kind of artifact. A stone with five rows of at least sixteen was found during survey at Anoyira *Peralijithias*. An array of 147 cup-holes patterned in three rows forming a triangle (Figure VII.3) was found on another stone at this site (Swiny 1986a: 35). A final pattern from this site shows two perpendicular three by ten patterns (Figure VII.4). There are two possible interpretations of this unique artifact: either it represents a game context in which more than one set of opponents gathered to play *senet*, or it was some kind of doubled version of the game (see, for example, the double game of twenty squares from Late Period Egypt; Crist *et al.* 2016b: 99–100; Refat 1972). Anoyira *Peralijithias* has produced the most aberrant patterns in the corpus and requires further investigation in order to determine if these are different local games or represent some other type of activity at the site.

Manufacturing Games: In order to understand the social contexts of these games, it is important to discover the choices ancient Cypriots made in the process of making them. Illuminating why people made these games in the ways that they did will help in the interpretation of the performance of gaming, as well as to understand whether these games were expedient or curated artifacts. Without the boards on which to play, a game cannot take place, and people are likely to have made manufacturing choices that affect

their ability to manipulate contingency, as the boards themselves play a crucial role in the performance of play.

The process by which *senet* and *mehen* games were produced on Cyprus has not been completely examined, likely due to the deceptive simplicity of the design of the games: a series of shallow pecked depressions most commonly on flat limestone blocks. However, examination of the entire corpus allows for some generalizations relating to the choices that were made by ancient Cypriots as they chose the materials, produced the patterns, and, in some cases, retouched them.

Every *senet* and *mehen* game found on the island was made from locally available stone. The great majority (221) were made of various kinds of limestone, the most plentiful stone found on the island and available as fieldstones throughout the landscape. Sites near the igneous Troodos massif (Marki *Alonia* and *Kappara*, Alambra *Mouttes*, Magounda *Kokkinokampos,* Kalavassos *Ayios Dhmitrios* and *Malouteri*) produced a small number (six) of games made from diabase, lava, and other igneous stones (Figure VII.5), though limestone games were the preference. The coastal sites of Maroni *Vournes* and Episkopi *Bamboula* also produced igneous games (S5 from Maroni *Vournes*, Figure VII.1), but these examples were manufactured from river stones, likely harvested locally from the Maroni and Kouris Rivers, respectively. The choice to manufacture games from limestone is not only related to its abundance in the landscape; it is also due to the ease in pecking depressions in this softer stone when compared to harder, denser igneous stones available. Limestone was commonly used as building material at Cypriot sites—and still is today—, but was mostly used for ground stone tools and stone receptacles.

Indeed, the choice of locally available stone is best exemplified by the assemblages from Episkopi *Bamboula* and *Phaneromeni*. Located on the banks of the Kouris River, which carried stone from the Troodos Mountains to the sea, these sites were provided with a wealth of rounded river stones on its banks. So much stone was found here that the PreBA 1 inhabitants of Sotira *Kaminoudhia* were exploiting it not only for picrolite, but also for igneous stone to use for ground stone tools (Swiny *et al.* 2003: 222). Many of the games from *Phaneromeni* and *Bamboula* were manufactured from the rounded stones from the Kouris (Figure VII.6). Even though the inhabitants of Sotira *Kaminoudhia* were exploiting the river for igneous stones not readily available at the site, none of the *senet* or *mehen* games there were eroded river stones, but instead were angular fieldstones readily available in the vicinity of the settlement.

It appears that, once chosen, the stone received minimal, if any, shaping to produce a playable surface, and particular stones appear to have been chosen because of their suitability for game play; namely, that they would lay relatively flat and present a level playing surface. Few of the stones exhibit evidence for shaping, retouching, or other working aside from the pecking of the game.

To peck the pattern of depressions into the river- or fieldstones, a stone of greater hardness than the material of the game had to be used to repeatedly strike the playing surface in order to produce depressions. Evidence for this method of manufacture can still be seen on some of the stones (Figure VII.7), where the limestone was coarse enough to still display strike marks typical of pecking. In the Levant, the preferred method of manufacturing depressions for gaming was to drill them, as best exemplified by the games from Arad (Sebbanë 2001). Drilling does not appear to have been employed in

Cyprus to manufacture these depressions, as the depressions constituting the games do not have striations that would be expected if they had been drilled (with the possible exception of S503 from Marki *Alonia,* Figure VII.8, and an unexamined game from Episkopi *Phaneromeni* that could be a forgery; Swiny personal communication). Pecking stones, typically of quartzite or chalcedony, are common at Bronze Age sites throughout the island, but drills are relatively rare finds.

While the patterns discussed above appear to be completed games, and are, therefore, discussed as different types, there are stones with yet other patterns of depressions which appear to be incomplete or contain manufacturing errors, such as crooked or non-parallel lines of depressions, that impacted the number and pattern extant on the playing surface. Four artifacts examined during the course of data collection appear to have been unfinished *senet* boards, as they display a single row of nine to ten depressions. From Episkopi *Phaneromeni*, S193 has a single row of depressions on one face, while the opposite contains a full *senet* pattern (Figure VII.9). This is also the case on S1064 from Sotira *Kaminoudhia* (Figure VII.10). In both examples, the incomplete pattern is rather ephemeral, while the depressions on the completed game are more distinct. Another example from Episkopi *Phaneromeni* (S392, Figure VII.11) displays a single row of ten depressions. At Evdhimou *Beyouk Tarla,* S37 has a single row of ten depressions, but preliminary pecking can also be seen on the stone where the person producing the game began a second row (Figure VII.12). At Marki *Alonia,* an incomplete *mehen* game was found (S355, Figure VII.13), with approximately 90 degrees of the outer ring of a spiral on one face. While it remains unclear why the *senet* patterns were never finished, this artifact was likely left incomplete because the surface of the stone

flakes easily, and one can see the difficulty the maker had producing it in the increasingly irregular depressions on the surface.

Other stones show evidence for some kind of difficulty in the production of games, but they were corrected on the same face. Many stones exist that have more than three rows of depressions, but almost invariably there are three rows of well-made, parallel depressions that appear to depict a coherent *senet* pattern, while additional rows are more haphazardly produced or ephemeral (Figure VII:14). Artifacts with more than four rows of depressions discussed above as discrete patterns do not demonstrate any difference in quality or alignment of the rows and are, thus, believed to be an intentional pattern. This may represent a preliminary attempt in manufacturing the game, either where the person producing it corrects the pattern after a failed first attempt at creating the pattern, or another person (the opponent?) more adept with a pecking stone taking over the production of the game after seeing a poorly made pattern in progress.

One stone in particular shows a complex history of use as a game. Discovered at Sotira *Kaminoudhia*, S613 (Figure VII.15) displays a total of seven rows of ten depressions on one face. In one corner of the nearly square surface, a senet pattern appears, but the depressions are obscured and run into each other, almost forming three channels rather than series of depressions. Toward the center of the stone, three rows of better-defined depressions can be seen, while another ephemeral row lies to one side of this pattern, parallel to the pattern of three rows but curving away from it at one end. The unusual appearance of two *senet* patterns on the same face needs to be explained. It is unlikely that this game was intended to be played by multiple people like the double *senet* pattern at Anoyira *Peralijithias*, as the board itself is probably not large enough to

accommodate more than two opponents playing concurrently. Furthermore, the *senet* pattern in the corner is of lesser quality than the central game and would have been difficult to play since the depressions are not distinct from one another. It is possible, though, that the corner *senet* was worn through use and a second pattern had to be created in order to continue using this stone as a game. However, while this second pattern was being recreated, one of the rows was not pecked in a straight line and was not included in the final *senet* pattern.

In all, at least seven games, all intended to play *senet*, appear to have been retouched after an unsatisfactorily executed row or rows were pecked on the same face (S613 from Sotira *Kaminoudhia*, 17, Figure VII.16 and an unnumbered example mentioned by Swiny from Episkopi *Bamboula*, 132-1, Figure VII.17, from Tokhni *Oriti North*, 328, Figure VII.18, from Maroni *Vournes*, and S211, Figure VII.19, and S457 from Marki *Alonia*). Other games display the same game on opposite faces of the same stone, and often there is a difference in quality between the patterns suggesting that, once completed, a pattern was deemed unsatisfactory and the opposite side was used to attempt a better quality game. For example, CHM RR-325 (Figure VII.20) from Episkopi *Phaneromeni* displays *mehen* on both faces, but one face has particularly large and well-defined depressions, while the opposite side has smaller depressions and a less easily distinguished spiral. Furthermore, the more poorly executed face appears to have served as the bottom face of the stone, since some of these depressions appear to have worn away, perhaps from being in contact with some surface. The side with the more distinct depressions would then rest on the upper face and likely was always displayed in this

manner since the weight of this game suggests it was not likely to have been moved frequently (see below).

Another important choice that was made during production was the addition of auxiliary features to the games. The most common feature to be seen on Cypriot games appears in the form of one or more larger depressions aligned to the side of the main pattern of depressions, in the case of *senet* (Figure VII:21), or at the beginning or center of the spiral (Figure VII.22), in the case of *mehen* (Swiny 1986a: 50). These larger depressions vary in size, number, shape, and placement in relationship to the game pattern (they can be located either along the width or the length of *senet* patterns), but most commonly only one or two auxiliary depressions are present. It is also of particular interest that the existence of these larger depressions is particularly popular in the southwest coast of the island, where 52 of the 64 games with auxiliary depressions where found. While the majority of the games from the Episkopi region do not contain these extra cup holes, their relative scarcity in other regions suggests that this particular variation was most common in the southwest and could indicate different local gaming traditions in this region. It has been suggested that these depressions were used to hold game pieces not being used on the playing field (Swiny 1986a: 48).

Another peculiarity among the material around Episkopi occurs at the ProBA sites Episkopi *Phaneromeni* and *Bamboula.* Two artifacts, one from each site (S231 from *Phaneromeni*, Figure VII.23, and 10412 from *Bamboula*, Figure VII.24), contain an incision bisecting a *senet* pattern. The game from *Phaneromeni* is fragmentary, but the incision clearly divides the pattern into two sections and appears on both sides of the stone. The example from *Bamboula* is intact, and the incision bisects the pattern in half. It

is probable that this was also the manner in which the pattern was bisected at *Phaneromeni* and demonstrates continued regional differences in gaming between the Episkopi region and the rest of the island. The function of these incisions may be purely decorative, though it is possible they served some function for the play of *senet*, which could represent a variation in the rules of the game when played on these boards.

Another variation of note is a chronological change in the way auxiliary depressions were represented on *mehen* games. While *mehen* games with auxiliary depressions were certainly not uncommon during the PreBA, since five examples are known, there are differences that appear during the ProBA that suggest some kind of differentiation in the settlement hierarchy. The *mehen* boards found at Hala Sultan Tekke (Figure VII.25), a first-tier site, and Maa *Palaeokastro* (Figure VII.26), a second-tier site, differ very much in quality from those found at Episkopi *Phaneromeni*, a fourth-tier settlement. Those found at Hala Sultan Tekke and Maa were finely made with a very large depression in the center of a well-made spiral, while those at Episkopi *Phaneromeni* are indistinguishable from PreBA versions of the game. This could reflect differences in attention paid to the quality of games based on the status of individuals in higher-tiered settlements versus those lower in the settlement hierarchy and could represent a continuation of traditional gaming practices in the interior or the appearance of new ideas of how a *mehen* board should be made on the coast. Depending on whether an accentuated central depression played a different role in games with it versus without, this patterning could also suggest a preference for a different way of playing the game in upper-tier settlements.

Other differences in the manufacture of games may be related to their use in mortuary contexts. The *senet* from Marki *Kappara,* found in what was once the burial chamber of a tomb (Swiny 1986a: 36), shows *senet* on two sides of the stone, but both patterns are obscured by a large pecked depression, rendering it unplayable (Figure VII.27). The ritual destruction of artifacts deposited into mortuary contexts is common during the PreBA, particularly with metal objects (Keswani 2004: 75), but this object could also have been destroyed in a similar way to prevent its further use. While the act of killing objects is related to demonstrations of wealth through its destruction (Keswani 2004: 75), with games there is no wealth being destroyed. The game likely had a more symbolic meaning that is inaccessible through the archaeological record. Another object, now in the Hadjiprodromou Collection in Famagusta, is made from terracotta and has the typical *senet* pattern displayed on one face (Figure VII.28). This object was purportedly found at Kotchati (Swiny 1986a: 33), but many of the objects found from Kotchati are now believed to have actually come from the looted tombs at Marki (Jennifer Webb, personal communication). It is likely that this artifact was a votive object rather than a game that was actually played, since it is the only example of its kind found on the island and it was likely found in a tomb, considering its state of preservation.

Summary: The morphology of gaming stones on Cyprus, at first glance, appears deceptively simplistic, with a small number of patterns of depressions preferred and not much variety in the materials from which they were manufactured, but closer analysis of the stones shows that Bronze Age Cypriots were making deliberate choices to make these games, and in some cases were taking extra care to make sure the patterns attained a

certain level of quality, perhaps to facilitate playing of the game. It has been sometimes suggested that the games were expedient artifacts (Falconer and Fall 2013: 113), whereby the players quickly pecked out a *senet* or *mehen* pattern on a stone and may not have used it again. However, the care that was given in the production of some of these games, in particular those showing that the game was remade on the opposite face when the first attempt was not of sufficient quality to satisfy the maker, suggests that these carefully made games were meant to be used more than once.

Cypriot regionalism may also have extended into the ludic sphere of life, as the corpus indicates that regional differences existed in the way games were manufactured during the Bronze Age. Aside from the appearance of a four rowed game, either a variation of *senet* or a completely new game at Maroni, other variations in the execution of the *senet* and *mehen* patterns suggest that the Episkopi region was particularly inventive in the ways they constructed games, and this could reflect differences in the rules of the games as they were played on different boards. Furthermore, the attention to detail that was paid to the production of *mehen* at first- and second- tier sites may also indicate a different set of rules, or an attempt to differentiate from the cruder examples known from lower-tier settlements.

What is clear is that Cypriots made a series of conscious choices when they wished to make a *senet* or *mehen* game that was related to material, type of game, embellishing features, and the quality of the game itself. Such choices might have been made for their use in the performance of play to manipulate contingency (see Chapter VIII), and it adds further nuance to the interpretation of the context in which games were played. Already, the distinction between *mehen* games at upper- versus lower-tier

settlements in the ProBA suggests that the games may have formed some part of identity construction. Morphological variations at Episkopi *Bamboula* and *Phaneromeni* and at sites in the Maroni Valley seem to point to localized versions of *senet* thatcould be connected to these local identities. Playing local versions contributes to grounding among members of that community by sharing this specialized knowledge, and also points to long-term variations that develop during the ProBA some one thousand years after the arrival of the games on the island. It is tempting to see these types as the result of divergences caused by cultural transmission, as certain innovations in game play take root in particular places.

Another choice that was made by the Cypriots was where to play the games, and such spaces can be determined through the location of heavy, permanently located games as well as clustering of artifacts displaying the same game in the same place. Such gaming spaces, once identified, would then allow for the identification of other activities, such as consumption, or production activities, that took place along with gaming and will help to contextualize the ways Cypriots harnessed games as tools for grounding and engaging with contingency as a method to negotiate the social changes of the Bronze Age.

2. Identification of Gaming Spaces

Another choice that was made during the selection of stones intended to become games was their size. With fieldstones plentiful in the landscape, a wide range of sizes were available to those seeking a stone on which to make a game, and its ultimate purpose as

either an immobile gaming installation or a portable game board would have been a major factor in choosing a stone of appropriate size and weight.

Out of the sample of games from Bronze Age Cyprus, 212 intact and broken games were weighed, and the reconstructed weight of the original artifact was calculated based on the number of depressions preserved (see Table A.1). The reconstructed weight of the games were then displayed as a box plot, in order to determine if the range of weights represented a continuous range or if some games were unusually heavy in comparison to the assemblage as a whole (Figure VII.29). With a median weight of 3.69 kg, the majority of the games apwere not always meant to be in a permanent location, ranging from 0.32–11.25 kg. Games heavier than this appear in the box plot as outliers, which are unusually large in comparison to the rest of the assemblage. Nineteen games, with weights ranging from 12.4–41.59 kg[3] were the outliers, and, thus, identified as likely to have been intended as immobile due to their weight and divergence from the rest of the sample.

Identifying the contexts in which these games were found becomes problematic when examining their archaeological provenance, as many of them were surface finds or found in secondary contexts (see Table VII.1 for contexts with heavy, fixed, and clusters of games). Episkopi *Phaneromeni* produced the greatest number of immobile games, with six examples, three of which were surface deposits (S280, CHM-RR 325, CHM-RR 328), while one is from a tomb (S84), another is from a stratified settlement context (S138), and the last is unaccounted for in the publication and field notes (S477).

[3] This count includes eighteen identified by the box plot and one game, the weight of which exceeded the capacity of the scale (40 kg).

Unit 19 at Episkopi *Phaneromeni* (Figure VII.30) was a partially roofed space in the LCI (later ProBA 1) portion of the settlement (Settlement A), a complex space that is not completely preserved (Swiny n.d.). It contained a hearth, flat stones imbedded into the floor for roof supports, as well as an alcove in the western wall of the space, in which a plank figurine discovered nearby was likely originally situated. The artifacts from this space are described as being "only marginally indicative of domestic pursuits" (Swiny n.d.). Included in the artifacts found here were two more *senet* games (S137 and S21), further indicating that this space was intended for the playing of games, since there were multiple examples of the same game as well as an immobile game (S138) located here.

Found as a tomb *plaka* blocking the entrance to the burial chamber of Tomb 23E (Swiny 1986: 60), S84 is a unique example of a *mehen* game that was incorporated into the mortuary equipment in a cemetery context. Its placement blocking the entrance to the tomb precludes it from interpretation as a gaming space,as it was placed vertically and, therefore, unplayable in this position, though it may have been played before its deposition. This game could serve as an indication of beliefs connecting games with mortuary practice of some sort.

As for the surface finds, S280 was found in Settlement A, while CHM-RR 325 and CHM-RR328 were both found in Settlement G, the MC III (early ProBA 1) portion of the site. While it is impossible to say anything further as to the contexts in which these games were played, the number of large, heavy games found at Episkopi *Phaneromeni* does suggest that permanent gaming installations were popular at the site, and there may have been multiple spaces intended for gaming (alongside other activities) throughout the settlement.

Four of the outliers in the box plot were found at Marki *Alonia* and three of these appear to have been found in secondary contexts. From Unit LXI, Phase H, *senet* S144 was found among fill from the collapse of the walls in the area (Frankel and Webb 2006a: 58). *Mehen* S13 was a surface find, while *senet* S830 was found among fill of a rebuilding phase of Unit XCV (Frankel and Webb 2006a: 66). The final immobile game from Marki *Alonia*, S150, was found in the occupation levels of Unit LXV, Phase G-1 (Figure VII.31), a long narrow space that formed part of the incompletely excavated Compound 19 (Frankel and Webb 2006a: 52).

Though the greatest number of games from a single site was discovered at Sotira *Kaminoudhia*, it only produced two immobile games, S163 and S1086. S163 was located in Unit 4, in a large square building in Area A (Figure VII.32), the domestic portion of the settlement (Swiny *et al.* 2003: 16–7, Fig 2.4). The game was found in the second phase of the building, during which it was subdivided into three spaces. The game was found adjacent to a lime plaster bin. The other large heavy stone from *Kaminoudhia*, S1086, was found in Unit 12 (Figure VII.33), already discussed as a possible gathering place for people to play games, as it produced the greatest number of games anywhere on the island (fourteen in all from the Unit 12 Complex).

Other heavy games were found at Alambra *Mouttes*, Hala Sultan Tekke, Maroni *Tsaroukkas* and *Vournes*. The game from Alambra (B310), a *senet*, was originally the threshold between Room 7 and Room 3 of Building I, and so its permanent location is certain (Figure VII.34). N1401 from Hala Sultan Tekke was also a *senet* and was found in Room 14 of Building C (Figure VII.35), the largest building at the site, which has been interpreted as the residence of a merchant (Åström 1996: 12). The game from Maroni

Tsaroukkas was repurposed as a stone anchor and was found redeposited in a pit in Building 1, in a secondary context without much use for interpreting gaming spaces. Similarly, at Maroni *Vournes, senet* 323 was found in wall tumble and was likely built into a wall that had fallen near pits 45 and 72. The remaining heavy stones identified by the box plot, S20 from Anoyira *Livadhia* and S14 from Anoyira *Peralijithias* were surface finds, and, therefore, only offer the suggestion that gaming spaces existed at these sites.

Permanently fixed games, i.e., those pecked into bedrock or immobile architectural features, were a relatively common feature of Cypriot Bronze Age sites. Fixed games were discovered at five sites: Alambra *Mouttes*, Dheneia *Kafkalla,* Maa *Palaeokastro*, Marki *Alonia*, and Sotira *Kaminoudhia.* The threshold from Alambra *Mouttes* (B310) has already been discussed above with the games that were weighed, as it was removed from the site. Three fixed games were found at Sotira *Kaminoudhia*. One *senet* was pecked into a bedrock outcrop in Unit 22 (Ft 25, Figure VII.36) that was later reused as a mortar (Swiny *et al.* 2003: 50). A *mehen* was discovered during the cutting of a road to the east of the site in the 1980s, pecked into the bedrock, and has no identified archaeological context (Swiny *et al.* 2003: 232). The only other game known to have been pecked into bedrock is the *senet* identified at Dheneia *Kafkalla* (Frankel and Webb 2007: 149; Hersher 1998: 320), a cemetery site. No artifacts were reported near this game, as it was exposed on the surface and not discovered over the course of excavation.

The final fixed game from Sotira *Kaminoudhia,* as well as the rest of them discussed here, was found pecked into an architectural feature. This *senet* game (S991) was found at the entrance to the Unit 12 Complex on a step leading down to the floor of

Unit 12 from the street level, though it was upside down when it was found (Figure VII.37). At Marki *Alonia*, S521, a *senet* game, was found on the northern end of bench 1883 in Unit CIII, Phase H-1 in Compound 7 (Figure VII.38). This was an enclosed space in the domestic unit, which was at one time a courtyard (Frankel and Webb 2006A: 76–7). At Maa *Palaeokastro,* The complex of Rooms 73/76/77/96 produced two *senet* games on two different thresholds (Figure VII.39). *Senet* I was pecked into the threshold between Rooms 76 and 96, an open-air courtyard (Karageorghis and Demas 1988: 46–8), while *senet* II was pecked into the threshold between Room 77 and the street, Area 88 (Karageorghis and Demas 1988: 49-50). The excavators interpreted these spaces, Room 73 in particular, as busy public rooms with considerable evidence for the preparation and consumption of food (Karageorghis and Demas 1988: 48).

Finally, units in which multiple games were found were considered to have been gaming spaces. In all, ten spaces were identified with multiple games. Eight of these spaces were at Sotira *Kaminoudhia* and require further equivocation. The greatest concentration of games came from Unit 12 at *Kaminoudhia* (Fig.VII.41), including the heavy and fixed games discussed above. Consisting of a large, open-air structure divided into four sections (Units 12, 12a, 12b, and 12c), the Unit 12 Complex formed a suite of spaces that the excavator interpreted as a locus of non-domestic, potentially ritual space (Swiny 2008: 48–50). In addition to the eight games found in Unit 12 itself, five were discovered in 12c and one in 12a, bringing the total of games from the entire complex to fourteen. In addition to those found within the complex, the three games found in Units 64/73 and the two from Unit 13, all very worn and fragmentary, can be considered to have been refuse from the Unit 12 Complex, as these exterior spaces appear to have been

dumping grounds for the activities that occurred within the complex. The games found in Unit 12c were all found on or close to the bench running along the northern and western walls of the unit, suggesting that either they were played on this surface, or they were stored there when not in play (Swiny et al. forthcoming). Considering that the immobile and fixed games were both located with six portable games in Unit 12, it seems likely that this, the largest open air space on the site, was likely where gaming took place within the complex, though perhaps not exclusively.

The next largest concentration of games at *Kaminoudhia* came from Unit 10 in Area C (Fig.VII.41). Once thought to be a large open air space (Swiny *et al.* 2003: 45), subsequent excavations have shown that it was bisected by a wall into two spaces, Unit 10 and Unit 56 (Swiny *et al.* forthcoming). Six games were discovered in Unit 10, which also produced significant evidence for consumption in the form of many small bowls found there (see below). Bordering Unit 10, but not communicating with it, was Unit 2, an open air space with white plastered walls that produced two further *senet* games. This large space has been interpreted as a large internal courtyard that was used in some kind of feasting activity, as shown by the large number of small bowls discovered there (see below). Yet another space in Area C, Unit 21, is adjacent to Unit 2 but does not communicate with it, and produced two *senet* games.[4] It is yet another large space, likely unroofed, with a high percentage of animal bone, along with a knapping station, suggesting specialized activity within this space (Swiny *et al.* 2003: 48–9), perhaps the preparation of meat for consumption.

[4] During the course of excavation, three *senet* games were found in the spoil heap containing stone removed from Units 21 and 8. It is impossible to determine which unit(s) these games came from, but the count of games from Unit 21 could have originally been as high as five.

In Area A (Fig. VII.42), Unit 44 is the only space that produced multiple games, three in number, all of them *senets*. One of these (S953) is the smallest game known from the island, with a reconstructed weight of 0.32 kg. Such a small game could be a unique example of a child's game, as the board itself is small enough to fit in the palm of one's hand. Both of the other games are incompletely preserved, and it is possible that one or both may have been broken and not in use when the site was abandoned. In fact, S957 was found in a portion of the room that had a significant amount of wall tumble, and so it may have actually served as part of a wall at the time of the earthquake that destroyed the site. Due to the broken and uncertain findspots of these games, Unit 44 was not designated as a gaming space for the purpose of this research.

The final two spaces that produced multiple games were at Episkopi *Phaneromeni*. Unit 13, already discussed above in connection to the heavy immobile game that was found in the same context, produced three *senet* games in all. As previously mentioned, this was a partially roofed space that may have had some kind of shrine component, possibly incorporating a terracotta plank figurine found nearby (Swiny n.d.). The other space at *Phaneromeni* identified as a gaming space is Unit 19, which also produced three *senet* games. The northernmost limit of the settlement, it is also the largest enclosed space at *Phaneromeni*. Though it feasibly could have been roofed using contemporary roofing techniques, it was likely at least partially open-air, as interpreted by Swiny based on the activities represented by the artifacts found there (Swiny n.d.).

Summary: In all, twelve spaces were identified as places where people came to play games, as evidenced by the permanent location of games in a space or by the

accumulation of multiple portable games in the same space. There were, of course, many other contexts in which single, portable games were found, but these cannot be designated as gaming spaces unequivocally. Evidence for the manufacture of stone game boards (as discussed above) suggests that games were often curated objects and, as portable objects, may have been brought by their owners to occasions in which gaming was appropriate, as well as played informally at home. A summation of the spaces in which all games were found at each individual site follows, with notes on the nature of each space:

Sotira *Kaminoudhia:* Thirty-eight games were found in seventeen different contexts. Fourteen came from the open-air, white plastered, Unit 12 Complex, a large communal space. Five more came from Units 64/72 and 13, which contained refuse from the Unit 12 Complex. Open spaces in Units 4, 2, and 21 contained gaming spaces, as did the enclosed space of Unit 10, which produced six games. Unit 22, though it contained a fixed game, was likely not used for gaming at the time the site was abandoned since the game found there was damaged by the pecking of a mortar overlapping the *senet* pattern. Units 18, 27, 44, and 57 were all interpreted as domestic spaces by the excavator and appear to have been roofed. Unit 30, an alleyway, also produced a game, but it was unfinished and likely was never played, having been tossed into this space with other refuse from surrounding units. Unit 56 is a room of average size that produced one game, but the presence of unusual finds complicates interpretation of this space.

Marki *Alonia*: While large communal spaces are not evident at Marki, an immobile game was located in Unit LXV in Phase G-1, and a fixed game was found as part of the bench in Unit CIII, Phase H-1. Portable games were found in Units XC (Phases F-1 and

H-1) as well as CII, which were the courtyards of Compounds 6 and 7, respectively. Unit L was also a large open-air space during Phase F-1, and a *mehen* game was set into the floor of this space, though no other artifacts were found there. Units CIV, XCV, and CXXI were all enclosed spaces that produced single games from their habitation deposits.

Alambra *Mouttes*: The threshold between Rooms 3 and 7 of Building I was a permanent fixture on which games were played. Another game was found on the bench in Building III, Room 10, though it was found broken in half and placed with opposite sides facing up on each half. This renders some difficulty in the interpretation of the use of the game in this space.

Episkopi *Phaneromeni*: Two spaces, Units 13 and 19, were places in which people gathered to play *senet*, as shown by the three games in both units, one of which in Unit 13 was likely immobile. Both spaces were at least partially unroofed. Unit 12, directly adjacent to Unit 13 and difficult to distinguish from it, also produced a *senet* game. The nature of this space is difficult to interpret, with open spaces to the east and north of it, and could have been some sort of transitional space. Unit 22, an outdoor space, produced an intact *senet* game. Units 10 and 16 were roofed spaces, as demonstrated by the presence of post supports and, in the case of Unit 10, a heavily burnt layer of ash that is likely the remains of the roof that was burned during the disturbance that ended occupation of the settlement. Units 27 and 28 were incompletely excavated, but both also appear to have been roofed domestic spaces.

Hala Sultan Tekke: An immobile game, the only one from a primary context at the site, was found in Room 14 of Building C, the largest building on the site and one that contained a considerable amount of ashlar masonry. It has been interpreted by the

excavator as the house of a merchant. It is of note that the three other games found at the site were built into the walls of this structure.

Morphou *Toumba tou Skourou*: An intact *senet* game was found in the earliest phase of the mound at *Toumba tou Skourou* on the charcoal floor in the "Room with Benches" (Vermeule and Wolsky 1990: 26–9). There were three benches running parallel to one another in this space, with many broken pots surrounding them. The space was either open or partially roofed. Stone plaques imbedded into the floor at regular intervals have been interpreted as the bases for wooden poles supporting a "lean-to roof of saplings" (Vermeule and Wolsky 1990: 27). It has been interpreted as part of a potters' workshop, due to the amount of broken pottery and unused clay found in this space. Bulldozing and looting in the eastern section of the mound has obliterated part of this space, so the full extent of it remains unknown.

Maroni *Tsaroukkas*: The only game found at this site from a habitation level was a 10-Ring game discovered in Room 3, a courtyard space, in Building 1. This space is difficult to interpret and is believed to have been a multi-purpose area with a considerable amount of production activity, including copper smelting.

Maa *Palaeokastro*: Two fixed *senet* games were found at this site, and both were incorporated into thresholds in the same structure. One was found in the threshold between Room 76, a roofed space, and Area 96, a large open courtyard around which Buildings II and IV were built, along with the complex of Rooms 76, 77, and 73. Area 96 produced considerable evidence for the production of food, as well as consumption. Immediately to the southeast of Area 96, Room 73 was a small roofed transitional space between the street and the courtyard, and it produced a *senet* game from the threshold

leading out to the street. The excavator described this space as a "busy and public room with people passing to and fro" (Karageorghis and Demas 1988: 48).

Pyla *Kokkinokremos*: A *senet* game was found in each of Rooms 12 and 27. These rooms are adjacent to each other in Complex C (Karageorghis and Demas 1984: 14). These rooms were located off of Room 32, an enclosed court, and are the furthest rooms from the entrance of the complex. It should be noted that both of these rooms were packed with rubble from some kind of destruction episode, and it is unclear whether the games themselves were part of the rubble or found below it.

3. Contextual Data

Having identified gaming spaces, it was then possible to collect the contextual data necessary to perform Correspondence Analysis (CA). Contextual information was collected for games that appeared to have been in primary context, whether they were in gaming spaces or otherwise. Tabulation of these data appears in Appendix B. This will help determine if gaming spaces are, indeed, functionally different from spaces that happen to have games in them. Counts of the artifacts found within each context were tabulated in Figures A.1 (PreBA) and A.2 (Pro BA), before they were combined into categories for more meaningful CA to allow for inter-site comparison in the light of regional and chronological differences in ceramic wares, particularly.

Sotira *Kaminoudhia:* Two excavation campaigns were conducted at this site, one in the 1980s and another in the early 2000s. The results of the 1980s campaign are published in Swiny *et al.* 2003, while the 2000s campaign is currently in preparation for publication.

Some of the contextual information from the later excavations was drawn from the forthcoming publication of that site (Swiny *et al.* forthcoming), while others had to be drawn from the excavation field notes, as those relevant chapters have yet to be completed.

Area A (Figure VII.42), which appears to have been primarily domestic in nature, had five spaces that produced games: Units 4, 18, 27, 44, and 57. As already mentioned, Unit 4 contained an immobile game that was found immediately adjacent to Feature 14, a lime plaster bin. The game dates to Phase II of the site, in which the large open space known as Unit 4 from Phase I was subdivided into three units, Units 19 and 20, forming a coherent complex of rooms. Unit 19 is the only one of these spaces that appears to have been roofed, and for the purposes of tabulating artifacts, Units 4 and 20 were considered the same space, as there is no evidence that they were ever separated architecturally. Finds were atypically sparse in Units 4 and 20, with a few ceramic, ground stone, and terracotta objects.

Unit 18, partially excavated during the 1980s and completed during the 2000s campaign, was a large space that is difficult to interpret. One fragmentary *senet* game was found among the rich occupational and habitation deposits in this room, which was plentiful in artifacts of all classes. A human skull was found here and was likely the remains of someone that was killed during the earthquake that destroyed the settlement.

Unit 27 was located in a complex of buildings that can be most convincingly identified as that of a complex of rooms that likely formed a coherent household, as it is well bound architecturally. It is, in fact, so well bound that there is no apparent entrance to the complex, which has led the excavator to suggest that it should be interpreted as a

basement (Swiny 2008: 47). A poorly preserved *senet* game was found in this unit, likely an interior space that appears to have been differentiated from Unit 28 to the west. A typical range of domestic artifacts was found here.

Unit 44 is a large space on the southern boundary of the excavated portion of Area A, and the artifacts exhibited an unusual degree of preservation, as a number of ceramic vessels were found along the walls of this space, smashed in place when the walls of the unit collapsed during the earthquake. A young woman was also crushed by the falling wall debris, and she was found within this space as well. The adjacent units, 52 to the east and 37, a corridor, to the south, both of which Unit 44 appears to have communicated with, were only partially excavated, so the relationship of Unit 44 to these spaces, and its function within the broader household of which it may have been a part, cannot be discussed further. The number of installations, which include the aforementioned vessels along the wall, as well as a large ceramic tray supported on stones, suggest that this is a uniquely preserved domestic space (Swiny 2008: 45).

Unit 57, immediately adjacent to Unit 27 but not apparently communicating with it, is a long trapezoidal space that communicated with the corridor to the east via a threshold, as well as to an unexcavated space to the west via an entranceway immediately across from the threshold. The limestone bedrock floor of Unit 57 was extensively discolored by burning, atypical of domestic spaces in Cyprus. This space produced a significant amount of material suggesting it was a workspace for the production of a number of different types of artifacts. Perhaps interestingly, it was the only portable game of *mehen* type that was discovered outside of Area B (including surface finds), the only

other *mehen* from outside Area B at *Kaminoudhia* being the fixed game pecked into the bedrock east of Area C.

Area B, to the west of Area A (Figure VII.40), consists of a number of spaces dominated by the Unit 12 Complex, a series of rooms that were subdivided by low parapet walls and contained artifacts of unusual type and in unusual numbers. The layout of the architecture in this complex reflects that of Late Bronze Age cult structures in Cyprus and the Levant. Comparisons have also been drawn between this space and contemporary genre scenes, terracotta models depicting activities that appear to be cultic in nature (Swiny 2008: 50). The artifacts from this complex do not reflect a typical range of household production and consumption activities such as cooking and weaving. Rather, a considerable amount of grinding of (presumably) grains can particularly be seen in Unit 12b, as well as two large stone basins unknown from elsewhere in the Cypriot PreBA. Other enigmatic artifacts in this space include a bovine scapula, copper slag, and a cache of partially worked ground stone tools all found in Unit 12c on or adjacent to the shelf that stretched along the western and northern walls. While there was a dearth of typical domestic ceramic wares in this location, there was an unusual number of dippers and heirloom pottery (Chalcolithic and Neolithic wares). Games were found in spaces that appear to have received refuse from the activities that were performed in the Unit 12 Complex (Units 64/72 and 13), as evidenced by the considerable number of broken saddle querns in Unit 64. Games were not found in Units 14, 11, 49, 62, or 69, none of which have a clear functional relationship to the Unit 12 Complex.

The third excavated portion of the site, Area C (Fig. VII.41), contains spaces that are not easily grouped together into communicable households or structures of other

kinds. Many different production and consumption activities are apparent in the different units discovered here, some of the spaces may be considered domestic, while others may have been specialized production areas. With six games, Unit 10 contains the largest concentration of games outside of the Unit 12 Complex. It was notably rich in occupational debris, suggesting it was an area with a high level of activity (Swiny et al 2003: 46). An unusually high number of small bowls and liquid containers was found in association with food processing equipment (e.g., griddles) in this enclosed space, leading the excavator to suggest that this was a space in which feasting took place. Indeed, three of the game boards (S77, S80, S117) were found near a 2.2 m long bench and were surrounded by fragments of small bowls (Swiny *et al.* 2003: 47). Interpretation of this space in the publication of the 1980s excavation campaign suggested that this feasting was cultic in nature, predicated on the nearby discovery of a modified cattle cranium with horns that was probably worn as a mask. Subsequent excavations showed that the space in which the bucranium was deposited, Unit 56, was separate from Unit 10. Though these spaces are adjacent to one another, there is no evidence that they communicated with each other and, thus, the feasting in Unit 10 may not have been associated with whatever ritual activity in which the bucranium mask was involved. Nevertheless, S234, a *senet* game, was discovered in Unit 56 near the bucranium. There were fewer ceramic finds here than in Unit 10, but many ground stone tools were discovered in the area, in particular pounders, suggesting an activity "requiring the pulverizing and pounding of substances (Swiny *et al.* 2003: 46).

Unit 2, adjacent to but not communicating with Units 10 and 56, was a large, likely unroofed, space that had white plastered walls similar to that in the Unit 12

Complex. Two *senet* games were found in this unit, as were fragments of 92 Red Polished small bowls. Again, this space has been a suggested site of feasting or communal activities (Knapp 2013: 287–8; Swiny *et al.* 2003: 41). This space does not appear to communicate with any of the surrounding spaces, save for Unit 25, which served as a vestibule for Unit 2.

Unit 21, a large open air space in the western portion of Area C with two *senet* games was approached via Unit 38 and, similarly to Unit 2, does not obviously communicate with adjacent Units 8, 24, and 26. A considerable concentration of animal bones, 135 pieces in all, were discovered in this unit, an atypical amount of zooarchaeological remains for this site (Swiny *et al.* 2003: 49). A knapping station was identified in the unit as well, perhaps for the production of chipped stone tools to be used in the preparation of meat for consumption.

Unit 22, to the north of Unit 2, was incompletely excavated and produced a fixed *senet* game that was probably not in use at the time the site was destroyed, as it was damaged by the creation of a mortar used in the production of liquids adjacent to it (Swiny *et al.* 2003: 50). The assemblage of artifacts from this space was described by the excavator as "varied but unremarkable" (Swiny *et al.* 2003: 51) and likely suggests that this was a domestic space similar to those located in Area A.

In sum, Sotira *Kaminoudhia*, the site that has produced the greatest number of games, unsurprisingly demonstrates that games were played in a wide range of different kinds of spaces. With communal spaces to which people brought portable games to play in conjunction with consumption of food and drink as well as fixed and heavy games

within domestic contexts, it may be possible to draw conclusions on both communal and private gaming practices.

Marki *Alonia:* Located in the center of the island, Marki *Alonia* was excavated from 1990–2000, and the results were published in two volumes (Frankel and Webb 1994; 2006a). In the final publication, a DVD was included which contained the finds databases from the excavation, including comprehensive contextual, descriptive, and metric information for the artifacts found at the site. It provided the most comprehensive accounting of finds from any of the sites under consideration, but much of the information, particularly that of the zoological and chipped stone remains, were not used in the CA because the other sites did not compile this data in a way that would allow for them to be consistently counted across the sites. One way in which the Marki *Alonia* data contains less resolution than the data from the other PreBA sites is that a distinction was not made between Red Polished and Red polished Mottled wares (see below under Alambra *Mouttes*).

The architecture of Marki *Alonia* is more easily categorized into groups of "compounds" most of which appear to be some sort of domestic unit (Frankel and Webb 2006b). The stratigraphy of this site is more robust than that of other sites, which has allowed the excavators to identify nine phases (A-I) of occupation at the excavated portion of the site (Figure VII.43), showing that it began as a small settlement (Phases A and B), grew in population (Phases C-G), and then slowly became abandoned (Phases H-I).

Two of the longest-lived compounds at the site, Compounds 6 and 7, both produced games from multiple phases of their occupation, pointing a continuity of gaming practice in these households. Compound 7 (Figure VII.44) produced the earliest game (a *mehen*) from a primary context, which was found among the Phase D remains of Unit CII. An interior space communicating with Unit CV and a large open space (Units CI and CIV) to the west, it produced a range of ground stone and ceramic artifacts, as well as four spindle whorls, suggesting some sort of textile production in this space (Frankel and Webb 2006a:74). Following a renovation of Compound 7 during Phase E, Unit CIV was converted to an internal space, and a double-sided game with *mehen* and *senet* on opposite sides was found among the remains of Phase F (Frankel and Webb 2006a: 75–6). Unit CII was converted to an open-air space, and it may be important that a game was not found there, but gaming appeared to have been relocated to the new interior space in Unit CIV, perhaps demonstrating a continued preference for gaming inside in this compound. A fixed *senet* game was found in Unit CIII during Phase H, located at one end of the bench in this interior space (Frankel and Webb 2006a: 77–8). Finds in all of these contexts appear to be typically domestic in nature, reflecting a variety of small-scale production and consumption activities.

Compound 6 (Figure VII.45), immediately to the east of Compound 7, was also occupied for the majority of the lifetime of the settlement. Continuity in the preferences for the location of gaming can also be seen in this household, as two games were found in Unit XC: one from Phase F and another from Phase H. Unit XC has been interpreted as the lane approaching the compound from the laneway, Unit CX (Frankel and Webb 2006a: 59–60). The *senet* game found during Phase F was located on the plaster-covered

bench (2246) at the junction of XC and XCVIII, the courtyard of Compound 6. Though the *senet* game found in Phase H was not on this bench, its use in this corridor may demonstrate a continued use of this space as the preferred venue for gaming among the members of this household. Finds in Unit XC were not plentiful for either phase, and a dearth of ground stone tools is particularly notable. The most abundant artifact type was Red Polished small bowls during Phase F, of which 24 were found.

Unit L (Plan VII.46), also known as the single-roomed Compound 24, was an area of open space in the western portion of the settlement (Frankel and Webb 2006b:296). A remarkable absence of finds from this space makes it unique and difficult to interpret with relation to the game that was found here, a *mehen* that was found embedded into the center of the space. This was originally described in the site publication as a post support (Frankel and Webb 2006a: 46), presumably to hold up a roof over the space. A similar game was found embedded into the floor of a courtyard at nearby Politiko *Troullia* (Falconer and Fall 2013: 113), which suggests that the placement of this game at Marki represents a wider practice of embedding games in open spaces, rather than their repeated use as post supports, which is unattested elsewhere. The only other architectural feature in this space was a plaster hearth against the northern wall of the space.

Unit LXV (Figure VII.31), the interior space of the small Compound 19, produced an immobile *senet* game from Phase G. A small space that likely did not offer much space for varied activity, it communicated with Unit LXIV, a larger open-air space (Frankel and Webb 2006a: 52). The most abundant artifacts within this space were Red Polished large and small bowls, suggesting some kind of consumption in this unit.

The final game from a primary archaeological context was a *senet* that was found in Unit CXXI (Figure VII.47), which during Phase H was the single-roomed Compound 23 opening onto a series of intersecting corridors (Frankel and Webb 2006a: 85). This space had a number of architectural features, including a hearth and a lime plaster bin, but artifacts were relatively sparse.

The patterning of games at Marki *Alonia* is different from that at Sotira *Kaminoudhia* in that no space has produced multiple games from the same phase, and neither were there obvious communal spaces that contained evidence for gaming. The assemblage at Marki may have more to say about long-term trends in domestic gaming than differences in communal gaming, but these could be examined in light of changing intra-site relationships as the settlement grew and then contracted. Comparison can also be made to the context of domestic gaming at other sites in an attempt to discern regional preferences in the playing of games.

Alambra *Mouttes*: Excavated from 1974–1985, the site of Alabamra *Mouttes* is also located in the center of the island, not far from Marki *Alonia*. Considerably smaller than Sotira *Kaminoudhia* or Marki *Alonia*, seven houses were discovered and published in a single excavation report (Coleman *et al.* 1996). The resolution of the data is roughly similar to that of Sotira *Kaminoudhia* but not as comprehensive as Marki *Alonia.* A difference in the nomenclature of ceramic types at the site was similar to the method used at Sotira *Kaminoudhia*, where a distinction was made between Red Polished and Red Polished Mottled wares, the former being of a finer buff fabric, while the latter is a harder, coarser and darker fabric (Swiny *et al.* 2003: 146–8). The terminology used at

Alambra *Mouttes* differs, though the fabrics described are the same. Red Polished A (RPA) at Alambra is the equivalent of Red Polished at *Kaminoudhia* and Red Polished B (RPB) at Alambra is the similar to Red Polished Mottled.

Two of the houses at Alambra *Mouttes* produced games. The first, already discussed in connection with the identification of fixed games, was a *senet* game found on the threshold between Rooms 3 and 7 of Building I (Figure VII.34). Interpreted as a household, Building I, like most others at this settlement, was divided into front and rear sections by a dividing wall. In this case, the threshold between Room 7, the front section, and Room 3, in the rear section, contains a game in this transitional space. Coleman *et al.* (1996: 38) noted that there was a higher number of RPA vessels in Room 7 than elsewhere at the site. Finds of note from Room 3 include a terracotta figurine and a mace head (Coleman *et al.* 1996: 41).

The second game from Alambra *Mouttes* was found in Room 10 of Building III (Figure VII.48) and was a *senet* game with a pattern on the opposite face that is difficult to interpret, but which could be a *mehen* of seven depressions (Coleman *et al.* 1996: 176). It was found on a bedrock ledge that was probably used as a bench. It was found broken in half, with one half face up and the other face down (Coleman *et al.* 1996: 67). The excavator interprets the placement of the game in this position as an attempt "to level off the uneven bedrock surface" after the game was damaged (Coleman *et al.* 1996: 174). The breaking of a limestone block of this size may not have been easily achieved, particularly by dropping, and certainly not through the movement of pieces along the board, so it is possible that the game was intentionally broken. This brings to light the further difficulty of interpreting broken games at other sites, which are plentiful. The

possibility that they were broken intentionally after they were played in certain circumstances is considered in Chapter VIII. In any case, this unique example of a deliberately placed, yet broken, game may offer insight into the interpretation of secondary practices related to games. Its context was included in the database to test how it would pattern among the other spaces in which games were found in primary contexts. Room 10 was interpreted as an "area of general living activity," and Building III as a whole was considered to be of " uniform domestic character," though the artifacts were smaller in quantity here than in any of the other buildings at the site (Coleman *et al.* 1996: 62–3).

Therefore, Alambra *Mouttes,* much like Marki *Alonia*, offers more in the interpretation of domestic gaming than the communal play of games. Building IV at Alambra appears to have been communal, containing the largest enclosed space on the site as well as a high proportion of well-preserved juglets and small bowls around a large hearth, indicative of communal feasting or ritual activity (Knapp 2013: 292; Coleman *et al.* 1996: 328–9). No games were found within Building IV, potentially indicating that gaming was absent from feasting activities at Alambra *Mouttes*. Though the presence of game boards made of wood or other perishable materials—which only rarely are preserved archaeologically on Cyprus— is always possible, there is no indication that they existed before the ProBA on the island. With the present evidence, it may be indicative that communal settings in the center of the island were not places where gaming occurred, though this may be a happenstance of sampling, since Building IV is the only structure in this region that provides considerable evidence for communal activity.

Episkopi *Phaneromeni*: Located on the southwest coast of the island, Episkopi *Phaneromeni* was excavated during the 1970s and was never completely published. A preliminary site report (Carpenter 1981) describes the different areas of the settlement, as well as some of the finds from the site. One volume of the final excavation report has been published (Swiny 1986a), which includes the ground stone and terracotta objects. A preliminary manuscript has been prepared by Swiny (Swiny n.d.) discussing the architecture as well as the artifacts that were discovered within each architectural unit. Other data not included in these publications were obtained from the excavation field notes and ground stone catalog, as required. Unlike the three previously discussed sites, sherd data were not available for Episkopi *Phaneromeni,* nor were they for the other ProBA sites under the scope of this research.

The architecture at *Phaneromeni* is similar to that of the ProBA settlements, in that it was rectilinear and agglutinative, with little evidence for planning. The games found at *Phaneromeni* in primary archaeological contexts were all located in Settlement A, the LCI (later ProBA 1) portion of the settlement (Figure VII.49). The architectural remains are not well preserved, as the site was destroyed by fire and was affected by looters and erosion after its abandonment. The poorly preserved architecture makes it difficult to speak of coherent compounds or households of the sort that are more easily identifiable at Sotira *Kaminoudhia*, Marki *Alonia*, and Alambra *Mouttes*.

Unit 13, the partially roofed space in the eastern portion of the settlement, was relatively sparsely littered with ground stone artifacts and a spindle whorl. An alcove in the western part of this space may have once housed a plank form figurine found broken

in the adjacent Unit 12. The presence of a hearth in the eastern half of the room suggests that this section at least was unroofed. As mentioned above, three *senet* games were found in this space, suggesting that it was a place where people came to play. The southeastern limit of Unit 13 was poorly preserved, and its relationship with Units 12, 22, 20, and 26 to the south is not completely understood. The entrance to Unit 13 appears to have been accessed via Unit 14 to the northwest and Unit 10 to the west.

Unit 10 itself produced a *senet* game among a number of finds of varied types. There appears to have been an emphasis on textile production and cooking, as seen in the large number of basin fragments, loom weights, and spindle whorls found in this space. It is relatively unclear as to whether all or just the southern portion of Unit 10 was roofed. It is centrally located in the complex of rooms making up the northern two thirds of the settlement and appears to have witnessed a considerable amount of activity during the occupation of the site.

Adjacent to both Units 10 and 13 was Unit 12, a small roofed space that produced a wide range of artifacts reflecting small-scale domestic production and consumption. Some artifacts of note include a copper pin and a piece of copper sheet metal. It is from this space that the fragmentary plank form figurine discussed in conjunction with Unit 13 was found. The wall that divided Units 12 and 13 was badly damaged in some spots to the point where it no longer divided them in places and, thus, it is possible that some of the artifacts originally deposited in these Units could have been intermixed through whatever taphonomic processes damaged the wall.

To the south of Unit 13, but east of Unit 12, was Unit 22, a space that is difficult to define, yet appears to have been an open air space. There were no other finds that

could be attributed to this space, and its relationship to the surrounding structures is not well understood due to the poor state of preservation of the architecture in this sector of the settlement.

Unit 19 also produced three *senet* games and was the largest enclosed space at Episkopi *Phaneromeni.* Interpreted as an enclosed courtyard by the excavator, the eastern portion perhaps was covered, as a thick layer of ashy debris was found in that section of the space, which may be the remnants of a roof, destroyed in the conflagration that destroyed the settlement. Unit 19 was relatively rich in finds reflecting a variety of different activities, perhaps with an emphasis on cooking as suggested by the hearth, griddle, and plaster bins found there. The only space with which Unit 19 appears to have communicated is the large open space, Unit 25, to the south.

A *senet* game was discovered in Unit 16, a relatively well-preserved interior space with some unusual finds. A post support located in the center of the room was also perforated, and probably used as a tethering stone to secure an animal. A stone trough, found *in situ* with a pair of lime plaster bins, a loom weight, ground stone tools, and many basin fragments, suggest an emphasis on cooking in this space but also with a range of domestic activities.

Senet games were also found in the incompletely excavated Units 27 and 28, on the westernmost edge of the excavated area. Both produced an ashy layer that was probably the remnants of the roofs of these spaces. The finds in Unit 27 were few, since only a corner of it was excavated, but they represent a typical range of small-scale domestic production activities. Unit 28, in comparison, was one of the richest on the site, with many artifacts that appear to have been undisturbed since its destruction. An

emphasis on grinding and storage can be seen in the assemblage here, with little evidence for cooking. Unit 28 may have communicated with or comprised another part of the same space as Unit 28a, a narrow portion of which was excavated that produced no finds except for two benches. The relationship between all of these spaces is unknown since they remain incompletely excavated, and they do not obviously communicate with any of the other spaces at the site.

Of all the ProBA sites under consideration, Episkopi *Phaneromeni* offers the greatest number of contexts from which games were found, which is not surprising considering it has produced the second largest assemblage of games on Cyprus. There are caveats to consider during the interpretation of material from this site related to the uncertainty of the integrity of archaeological contexts due to looting and erosion after the destruction of the site, but it offers the best comparison with PreBA sites. It is also important to consider in the analysis as a fourth-tier settlement site to compare with the second- and first-tier ProBA sites examined during this research.

Hala Sultan Tekke: The site of Hala Sultan Tekke was excavated from the 1970s through the present, and a series of preliminary publications have presented a portion of the excavated material (Åström 1985; 1986; 1996; Åström *et al.* 1989; 2001). Pending full publication of this site, its inclusion in the CA is impossible at this time. Despite this, there are some things that can be said about Room 14 in Building C, which is the most notable monumental ashlar building at the site (Knapp 2013: 373). Room 14 was located to the right of what appears, from the site plan, to be the entrance to the building (Åström 1989: 13). It communicates directly with the large forecourt, Room 19 that led to the

inner courtyard, Room 23. It has been suggested that this was the house of a merchant (Åström 1996: 12), due to the varied range of imports from the Aegean, Ugarit, and Canaan, as well as evidence for the production of purple dye (Åström 1985; 1986: 11–3). Interestingly, the three other games discovered at Hala Sultan Tekke were also found in Building C, but were in secondary context, built into the walls of this structure. It may be a mere coincidence, but the presence of all of the games within the same building (whether played there or not) is striking.

Morphou *Toumba tou Skourou*: The other first-tier settlement to have produced a *senet* game, Morphou *Toumba tou Skourou* was begun as a rescue excavation when bulldozing activity uncovered a settlement on the north coast of the island. The excavation was cut short in 1974 with the invasion of the island and its subsequent occupation, which rendered the northern portion of the island inaccessible to archaeological investigation. The results of the excavations have been published (Vermeule and Wolsky 1990) in an incomplete manner since much of the material that was excavated leading up to the invasion remains uncatalogued and incompletely analyzed.

The lone *senet* from the occupation levels of the settlement came from the earliest phase of occupation (Figure VII.50), from the so-called "Room with Benches." The space was incompletely excavated due to the crowded space and the need to preserve the upper levels of the mound (Vermeule and Wolsky 1990: 25). Dating to the transition between LC1A-B (later ProBA 1), the Room with Benches is the only portion of the site dating to that period that has been excavated and its relationship to the rest of its contemporary settlement remains unknown. There were three successive floors in the space, which were

likely renovated periodically due to weather exposure, rather than due to any change in function (Vermeule and Wolsky 1990: 26–7). Two benches were found in this space, which have been suggested as seating for workers, probably potters, as is suggested by rows of pots and the presence of unused clay in the room (Vermeule and Wolsky 1990: 28). Aside from the *senet* game found in this space, a range of ceramic vessels were found. No other artifact types are listed from this context.

Maroni *Tsaroukkas*: A part of the Maroni complex of sites, Maroni *Tsaroukkas* was excavated during the 1990s and 2000s, with preliminary reports discussing some of the finds (Manning 1998a; Manning and DeMita 1998). A comprehensive excavation report is currently in preparation (Manning forthcoming), and David Sewell has kindly provided contextual information. In the interest of consistency, sherd data has not been included in the data for CA in order to be able to compare Maroni *Tsaroukkas* to the other ProBA settlements in this research. The Maroni complex of sites includes the two main excavated settlement sites of Maroni *Vournes* as well as *Tsaroukkas. Vournes* was located on a small hillock, on which was located a monumental building constructed of ashlar masonry that was visible over the coastal plain (Cadogan 1996: 16–7). These buildings were constructed over earlier tombs, which may have been an act of political legitimization of a dominant group over another group (Manning 1998b: 51). *Tsaroukkas* was part of the same settlement that included the monumental architecture at *Vournes*, though its location immediately on the coast as well as the more utilitarian finds there suggest that it functioned as the port for the settlement (Manning and Sewell 1998: 116).

The single game that was found in a primary context at the site was a 10-Ring game, found in Room 3 of Building 1 (Figure VII.51). This was the courtyard area of the building and appears to have led to a monumental doorway that served as the entrance to the building. Finds in the courtyard were varied and suggest the production of textiles as well as copper smelting and other "crafting activities" (David Sewell, email dated 2/5/2013). The building as a whole seems to have been part of a specialized port and production area with crafting and storage areas (Manning and DeMita 1998: 122). Building 1 also produced another game, a large, heavy *senet* that was reused as a stone anchor and redeposited in a pit (Manning forthcoming). Though this game was found in a secondary context, it is interesting to note, considering the games that were also reused in other ways, such as those from Hala Sultan Tekke that were found built into the walls of Building C.

Maa *Palaeokastro:* Positioned on a small peninsula jutting from the western coast of Cyprus, Maa *Palaeokastro* was excavated from 1979–1986 and has been completely published (Karageorghis and Demas 1988). It is a second-tier fortified settlement and is often compared to Pyla *Kokkinokremos* (see below). Like the other ProBA sites, sherd data was not available from Maa. The gaming stones were found in the "Floor II" phase of the site, dating to LCIIIC (end of the ProBA 3). Four major buildings were excavated, numbered I-IV, but the spaces adjoining and surrounding Building II are the most relevant for this study, as the games from Maa were found in this portion of the excavation.

While five games in all were discovered at Maa *Palaeokastro*, only two were found in archaeological contexts allowing for the interpretation of gaming contexts (Figure VII.39). These games were both found in the complex of rooms (Rooms 73, 76, and 77) between Buildings II and IV, which communicated with Area 96, a large open courtyard situated between these structures. Both games were examples of fixed games on thresholds, one in the doorway between Area 96 and Unit 76, and the other between Unit 73 and Area 88, the street. Unit 76 produced a number of ground stone tools, as well as a smashed Canaanite jar and the best-preserved hearth on the site (Karageorghis and Demas 1988: 46–7). Area 96 produced evidence for food production and consumption, including Mycenaean drinking cups and many skyphoi (Karageorghis and Demas 1988: 48). Unit 73 served as "a link between the centres of activity concentrated around Area 96 and Area 88" (Karageorghis and Demas 1988: 48). The ceramics from this room may suggest drinking, with a Mycenaean pilgrim flask and a Plain White Wheelmade crater among the finds (Karageorghis and Demas 1988: 49). Area 88, the street outside Unit 73, produced few artifacts, none of which can be attributed to the section of the street nearest this room.

The other three games found at this site are unfortunately in secondary context. The most notable game from the site, a double-sided *senet*/*mehen* game, was found built into the wall of Room 55 to the north of Building II (Karageorghis and Demas 1988: 27), as was a *senet* in the western wall of Room 75A, Floor I (Karageorghis and Demas 1988: 82). The double-sided game has its closest morphological parallel to another game at Hala Sultan Tekke (GS2), which was also built into a wall. The final game from the site was found in Pit 4, the digging of which destroyed the northernmost rooms of Building

III (Karageorghis and Demas 1988: 80). Therefore, only the two threshold games were found in a context suitable for CA, but these games from Maa *Palaeokastro* in adjacent units are the closest example of clustering of games to be seen in ProBA Cyprus outside of Episkopi *Phaneromeni*

Pyla *Kokkinokremos:* Located on the eastern coast of the island, not far from modern Larnaca, this settlement was excavated from 1981–1982 (Karageorghis and Demas 1984), and again from 2010–2011 (Karageorghis and Kanta 2014). Pyla *Kokkinokremos* is the final ProBA second-tier settlement to have produced games, one *senet* and one *mehen* game (Figure VII.52). This site was divided into nine complexes, which appear to have each been individual households. Finds were categorized in a manner similar to that of Maa *Palaeokastro,* as were those from the remainder of the ProBA sites, with sherd material absent from the publications.

Of the nine complexes, Complex C stands out not only because it lacks the western entrance court shared by the other structures at Pyla, but also because it is the only one in which games were discovered. The games were found in the two northernmost rooms of the complex, Rooms 12 and 27, both of which communicated with the large open air space to the south, Room 32. Room 12 was incompletely excavated due to the thick mass of rubble that filled this space, and only a small portion was removed. Room 27, which had less rubble fill, was a space that was devoid of artifacts aside from the *senet* game that was found there, likely due to the abandonment of the building and subsequent collapse of the structure (Karageorghis and Demas 1984: 14–5). No games were found from the more recent excavations.

4. Correspondence Analysis

Using the artifact counts collected from the above contexts, Correspondence Analysis (CA) was performed using MYSTAT 12.02.00. The CA was undertaken separately for PreBA and ProBA contexts as well as for individual sites with multiple spaces that produced games (Sotira *Kaminoudhia,* Marki *Alonia*, and Episkopi *Phaneromeni*). Performing it separately allows for comparisons between contemporary sites as well as the identification of site-specific differences in gaming practices. Furthermore, comparing the disparities in the PreBA and ProBA plots will point to differences in gaming contexts as society changed from small-scale in the PreBA to complex in the ProBA. In order to produce results from the CA that were interpretable archaeologically, it was necessary to group the artifacts compiled in the database into meaningful categories. The grouping strategies employed for each iteration of the CA differed, based on the data collected from the sites in question, as well as the types of activities that were represented by the artifacts, taking into consideration contemporary social processes for each site and time period. The tabulation of artifacts in the spaces used for the CA can be found in Appendix B, while the results of each iteration can be found in Appendix C.

Prehistoric Bronze Age: To perform CA for the three PreBA sites in this study, differences in the data collection and publication methods were taken into consideration. Since zooarchaeological and lithic artifacts were not uniformly reported across the sites, they were not included in this iteration of the CA. In addition, Red Polished Mottled wares were not differentiated from Red Polished wares at Marki *Alonia* (Frankel and Webb 1996: 110) as they were at Sotira *Kaminoudhia* and Alambra *Mouttes,* so this

distinction was not made in the database used for CA. Black topped bowls were also considered to be Red Polished small bowls, to continue the emphasis on form rather than decoration. All storage vessels were combined regardless of ware (Red Polished, Coarse Ware, and Pithos), and juglets, flasks, and gourd juglets were all considered to be juglets. This allowed for the comparison of ceramics based on function and prevented the particularities of data collection at each site from biasing the CA results. Other ceramics that were not of the Red Polished tradition were grouped as either heirloom or imported ceramics and subdivided by vessel form. Heirloom pottery consisted of Chalcolithic (Black Lustrous and unspecified Chalcolithic wares) and Philia (Red Polished Philia, Philia Red Slip, White Painted Philia, Black Slip and Combed Wares) pottery that predated the contexts in which the games were found. Imported ceramic types included Drab Polished Blue Core, a ware believed to originate in the south west of the island (Frankel and Webb 2006a: 140), and Black Polished ware, a north coast type (Frankel and Webb 2006a: 139). These ceramic types were traded to the sites under consideration, as local imitations of Black Polished ware are easily distinguished (Swiny *et al.* 2003: 152), and Drab Polished Blue Core vessels are chemically distinct from local Red Polished wares at Marki, indicating the use of non-local clays (Summerhayes *et al.* 1996: 178–9). For the CA, Black Polished bottles were considered to be imported juglets, while Drab Polished Blue Core tankards and jugs were combined into the "imported serving and drinking" group These categories are compiled in Table B.3.

In addition to the ceramics, it was necessary to combine ground stone, metal, terracotta, bone artifacts and architectural features into functional groups to produce a more robust dataset. The resulting groups are presented in Table B.4, along with the

artifacts contained therein. There were some artifact classes that were eliminated from the database since only a single artifact was represented in the dataset, and their functions are nebulous and, therefore, impossible to place in a meaningful interpretive group. These include: perforated disk, stone with depression, perforated stone, work surface, chalcedony flake.

Only fully excavated primary contexts were considered in the CA, and, thus, assemblages from Units 13, 22, 30, 39, and 64 at Sotira *Kaminoudhia* were not included. Furthermore, since only a hearth was found along with a game in Unit 50 at Marki *Alonia*, this context was not included in the analysis because of the lack of finds that could skew the CA.

When CA was performed on PreBA contexts in MYSTAT using all of the categories enumerated above (Tables C.1–C.7), it produced a result which grouped most of the contexts together, while two outliers were apparent: Unit 103 at Marki *Alonia* and Unit 4 at Sotira *Kaminoudhia* (Figure VII.53). Examining the inertia of each of the categories (the distance of that category from the average), it is readily apparent that the outlier status of these two contexts is produced by the presence of food preparation/storage features there, as this group contributes 28.5% of the inertia in the second factor, that which is visualized on the Y axis. Because this category seems to be obscuring other patterning in the data, in particular the presence of three food preparation and storage emplacements in Unit 103 at Marki *Alonia*, it was determined that the CA should be performed again with this category excluded.

The second iteration produced a more easily interpretable result with clearer patterning in the output (Fig. VII.54, Tables C.8–14). Meaningful results can be

displayed along three axes, representing three factors that together account for 39.3% of the variation in the data, which is in line with similar archaeological applications of CA (Shennan 1997: 331). For interpretive purposes, the factors are best displayed in two-dimensional scatterplots, with factor one as the X-axis in both plots, factor two serving as the Y-axis in the first plot (Fig. VII.54), and factor three as the Y-axis in the second (Fig. VII.55). Since MYSTAT does not have the capability of plotting beyond the second factor, the scatterplot including the third factor was obtained by entering the data into Paleontological Statistics Version 3.0 (PAST 3.0).

In comparing factors one and two, a pattern in the data is revealed that represents 28.8% of the variation in the data. The points for the contexts appear to be arrayed in three clusters, labeled Clusters A, B, and C, with one outlier, Sotira *Kaminoudhia* Unit 21. In order to determine the archaeological meaning represented in the scatterplot, it is important to consider not only the artifact types that are associated with each cluster, but also to consider the nature of the units involved in terms of whether they were gaming spaces and/or indoor or outdoor spaces.

Cluster A consists of six roofed spaces, one of which (Unit 10 at Sotira *Kaminoudhia*) was determined to be a gaming space. Unit 10 from Alambra *Mouttes* is the only context in this cluster not at Sotira *Kaminoudhia*. The other spaces were from *Kaminoudhia*, and all contained single portable games. The bulk of the artifact types included in the analysis was associated with this cluster, particularly items associated with production and storage. The presence of Unit 10 from *Kaminoudhia*, which had a larger than expected number of games (six in all) for a context that is grouped with domestic spaces, is contrary to the excavator's interpretation and is unexpected.

Cluster B contains a range of spaces from both Sotira *Kaminoudhia* and Marki *Alonia* and seems to reflect different practices in these spaces. Considering the range of artifacts associated with this group of contexts, it appears that these spaces were less involved in production and focused somewhat more on consumption and other specialized activities. Juglets, which likely contained valued liquids such as aromatics, medicines, or psychoactives (Chovanec 2013: 304–14), as well as heirloom pottery and spouted vessels, suggest consumption in these spaces, although all of these spaces are not likely to have been places where feasting occurred. The contexts in this cluster are a mix of roofed and open air spaces and contain gaming spaces as well as spaces with single portable games.

Four contexts are represented in Cluster C, three of which are gaming spaces. Conspicuously, this cluster consists of the three units from the Unit 12 Complex at Sotira *Kaminoudhia*, along with the transitional space in Building 3 at Alambra *Mouttes* with a fixed game on its threshold. These spaces are most associated with the pounding and rubbing group of ground stone tools, as well as games and uncommon groups such as imported small bowls and copper smelting. It is more apparent that these contexts are less closely associated with locally produced Red Polished ceramics than the contexts in Clusters A and B. It is possible that these spaces are clustered together as a reflection of the relative absence of this kind of ceramic evidence. Unit 12a, the only space in this cluster that was not considered a gaming space based on the single portable game that was found there, was, nevertheless, closely associated with Unit 12, as it was only partitioned from that space by a low parapet wall. Unit 21 may either be part of Cluster C

or an outlier between Clusters C and B and may represent a space that shares some of the activities that took place in those clusters.

While this patterning is suggestive that there were different contexts in which games were played, it may also be reflective of regional patterning in gaming practices. It is interesting that none of the contexts from Marki *Alonia* appear in Clusters A or C. Their absence from Cluster C may be a reflection of the absence of the large, open-air spaces represented by the Unit 12 Complex in this cluster.[5] It is more difficult to explain their absence from Cluster A, which consists of indoor, apparently domestic, spaces that have been argued to form the dominant type of structure at Marki (Frankel and Webb 2006b). It could reflect differential uses of space between Sotira *Kaminoudhia* and Marki *Alonia*, where certain activities that were performed in roofed spaces at *Kaminoudhia* were performed in outdoor spaces at Marki *Alonia,* and vice versa.

Another explanation could lie in the different histories of these two settlements. Sotira *Kaminoudhia* was destroyed by an earthquake, and it is possible that the contexts in Cluster A primarily reflect places where portable games were not currently in play, but were being kept for future use, upon the sudden destruction of the site, whereas those in Cluster B may have been located nearer to the places in which they were played, abandoned there after use. There were no contexts that produced fixed or heavy immobile games in Cluster A; the only context identified as one in which games were played was Unit 10 at Sotira *Kaminoudhia*, which produced six portable games. Immobile and heavy games were found in Cluster B contexts, i.e., Unit 4 from Sotira *Kaminoudhia* and Unit

[5] It should be noted that in a trial run of the CA with Unit 50 from Marki *Alonia* included, it was plotted among the Cluster C contexts. This space was not included in the final CA for reasons discussed above.

CIII from Marki *Alonia.* Other contexts in Cluster B include games from Marki *Alonia* Units CIII and Unit XC Phase F, which were located on benches where they were likely played. Other games were found on or having fallen off a shelf in Unit 12c at *Kaminoudhia*. One game that was on a bench but was definitely not in play in that location was the one found in Room 10 at Alambra *Mouttes*, found broken in half with opposite sides facing up. This context is located in Cluster A. If Cluster A does reflect spaces in which games were being stored but not played, it may further suggest that the bucranium mask found along with the game in Unit 56 was also not in use, and that this room was not a ritual space but perhaps one in which material used in communal activities was stored. A more tentative suggestion could be that this was the residence of a person that had some kind of significance who used this mask in the kind of ritual activities seen by people wearing similar masks in contemporary art, particularly figurines (Karageorghis 1982: 101).

Therefore, it seems that Clusters B and C are more likely to have been the contexts in which games were played, while those in Cluster A were contexts in which games were kept when not in play. The spaces in Cluster C appear to have contained different activities than those located in Cluster B, and the nature of those spaces may suggest that it was some sort of communal activity, though not likely associated with feasting, since these contexts were not associated with artifact groups related to consumption.

Plotting factor three against factor one, little further patterning of archaeological import is apparent in the data except that Sotira *Kaminoudhia* Unit 4 and Marki *Alonia* Unit CIII again appear as outliers (Fig. VII.55). These two places contained a fixed and

an immobile game (Unit CIII and 4, respectively), and their presence as outliers may suggest further differentiation between these spaces and the others in Cluster B. Since none of the artifact classes seem to be associated with these outliers, it is likely that the relatively sparse scatter of artifacts found in these spaces makes them distinct in this plot.

To further explore the different contexts of gaming in PreBA Cyprus, CA was performed individually for Sotira *Kaminoudhia* and Marki *Alonia* to determine if the patterning apparent in the CA for all PreBA sites is reflective of different kinds of activity spaces at these two sites individually. It may also allow for the examination of intra-site patterning that could be masked by the inclusion of other sites. Furthermore, the inclusion of artifact types not included in the comprehensive CA (e.g., zooarchaeological and lithic materials from Marki *Alonia*), as well as greater resolution in the ceramic data (at Sotira *Kaminoudhia*) may allow for the finer description of the contexts in which gaming occurred during the PreBA.

Sotira *Kaminoudhia*: Performing CA on the material from Sotira *Kaminoudhia* (Tables C.15–C.21) alone allows for the distinction of Red Polished and Red Polished Mottled wares, which may have been important for the function of the vessels, as Red Polished is a finer ware, while Red Polished Mottled is coarser (Swiny *et al.* 2003: 146–8). Furthermore, the food preparation and storage group was included in this site-specific analysis, as it did not provide outsized inertia in the data.

The scatterplot of the first two factors (comprising 42.4% of the total variation) produces patterning very similar to that seen in the CA of all PreBA sites (Fig. VII.56). Three clusters are apparent, and they appear to follow similar patterns to the overall

PreBA clusters. Cluster A is comprised of the same units that appeared in Cluster A in the PreBA scatterplot: four indoor units that produced portable games. These are associated again with the bulk of the household materials, including the majority of the Red Polished Mottled ceramics. Unit 27, which was included in Cluster B in the PreBA plot, appears here in Cluster A.

Three spaces are included in Cluster B, Units 2, 4, and 18, the latter of which was located in Cluster A in the PreBA results. The two open air spaces, Units 2 and 4, were both identified as likely loci of gaming activity due to the presence of multiple and fixed games, respectively. Cluster B is associated with Red Polished and Coarse Ware ceramics, including Red Polished small bowls and cooking pots, which may indicate the production and consumption of foods in these finer ware vessels.

Finally, Cluster C consists of open air spaces: Units 12A, 12C, 21. Unit 12 could be considered part of this cluster as well, but may also be an intermediate point between Clusters B and C. These units seem to function similarly to Cluster C of the PreBA plot, being less associated with many of the production and consumption activities apparent in the other two clusters. In contrast to the PreBA analysis, the types of artifacts associated with this cluster include heirloom, specialized, and imported pottery, which may further indicate specialized communal activities in these spaces.

Overall, the interpretation of the PreBA scatterplot seems to fit with that from Sotira *Kaminoudhia* alone: Cluster A seems to represent domestic contexts with a varied range of activities and may have been places where games were kept, but not being played at the time of the destruction of the site. Cluster B contains games that were located in spaces that were more closely associated with consumption activities utilizing

finer ware (Red Polished) ceramics. Cluster C again represents all open air spaces, most of which were identified as gaming spaces and show associations with imported, heirloom, and specialized ceramics, and not demonstrating a full range of domestic or consumption activities that are apparent in the other two clusters.

Marki *Alonia*: With only seven spaces that produced games, the interpretation of the material from Marki *Alonia* is somewhat more tentative than that from Sotira *Kaminoudhia*, but it must be attempted to test the results from the PreBA scatterplot and to compare them to *Kaminoudhia* to determine if there are site-specific patterns of gaming. Furthermore, since zooarchaeological material was tabulated by unit in the publication of this site, it was possible to include these data to determine if they could offer any insights to gaming practices. Zoological remains were counted and grouped by species (cattle, sheep/goat, pig, and deer).

In the first iteration of the CA (Tables C.22–C.28), two outliers were identified, Units 103 and 121 (Fig. VII.57), but again food processing and storage features had an outsized inertia value, as did architectural features, lime features, and personal ornaments. When these groups were excluded (Fig. VII.58, Tables C.29–C.35), the CA produced a scatterplot (factors one and two equal 49.7% of the variation) that may show chronological considerations in changes of gaming practices at the site. Two clusters are apparent in the data, as are two outliers. Cluster A consists of two spaces, Units CII and CIV, both in Compound 7. These spaces are closely associated with most of the heirloom (Philia) ceramic groups. Other household activities represented in this cluster include grinding and the processing and/or consumption of sheep/goats and pigs.

Three contexts are represented in Cluster B: Units LXV, XC Phase F, and CIII. This cluster is most closely associated with most of the rest of the range of household production and consumption activities present at the site. These contexts may represent a change in the context of gaming during phases F-H, particularly in Compound 7, where Unit CIII (Phase H) shows what seem to be different activities than those seen in the earlier phases of the compound found in Cluster A, perhaps a change from specialized context to a more household one. An opposite change could be apparent in Compound 6, where the domestic context in Unit XC Phase F differs from that of XC Phase H, which appears in the CA as an outlier most associated with heirloom, specialized, and pouring vessels (gourd juglet and spouted vessel, respectively). Unit CXXI is another outlier, due to the presence of weaving activities in that context.

The material from Marki *Alonia* is difficult to interpret due to its smaller sample size, but there could be some indications of trends in the ways gaming contexts changed over the course of the occupation of the settlement. It is difficult to know whether the games were located in places where they were played, as only one of the spaces (Unit CIII) produced a fixed game. The evidence available, however, appears mostly to reflect chronological changes in gaming at the site, which could have been in response to changing social dynamics during the relevant phases.

Summary: When performed on all PreBA sites, CA produces three clusters of contexts: one that appears to contain domestic contexts in which games were kept but probably not played, one which contains a mixture of domestic and communal spaces that appear to contain more of the types of activities expected to accompany gaming (e.g., consumption

of food and drink), as well as a final cluster that contains strictly open air spaces and places where people gathered to play games and where people seem to have eschewed the typical consumption and production activities represented in the other two clusters. Further details are provided by Sotira *Kaminoudhia* and Marki *Alonia*. At *Kaminoudhia*, the pattern closely reflects that of the broader PreBA, but suggests that heirloom, imported, and specialized ceramics were more closely associated with the gaming spaces than is apparent in the PreBA analysis. The CA of contexts at Marki *Alonia* seems to show finer chronological change in gaming in some compounds at the site, but all of the clusters seem to show a mix of production and consumption activities that are apparent in their grouping in the PreBA analysis. This patterning provides a starting point from which to discuss changes in gaming as it relates to changing relationships that coincide with increasing social complexity.

Protohistoric Bronze Age: Performing CA on the ProBA sites for which data were collected, while necessary to make comparisons with the PreBA gaming, was difficult because fewer contexts with games were available, and fewer artifact counts were included since sherd data were not available. Furthermore, the contexts at Pyla *Kokkinokremos* that produced games did not contain any other artifacts, so they were excluded from the analysis to avoid biasing the results (See Tables C.36–C.42 for the contexts included in the CA). Artifact counts were grouped similarly to the way they were grouped for the PreBA contexts. Perforated stone, marble plaque, and work surface counts were eliminated because of the ambiguous nature of their function. With regard to ceramics, few types occurred at multiple sites, so most of the counts were not grouped

further. Ceramic types were grouped by shape, though only bowls, spouted bowls, and jugs were represented in multiple wares. Imported wares were kept as separate categories from Cypriot wares, to make distinctions between practices that would have used local versus imported wares.

The first iteration of the CA of ProBA contexts (Fig. VII.59) produced two outliers when plotting factor one against factor 2 (33.47% of the total inertia): the "Building with Benches" at Morphou *Toumba tou Skourou* and Room 1 at Maroni *Tsaroukkas.* It closely grouped the contexts from Episkopi *Phaneromeni* and Maa *Palaeokastro* into one cluster. Factor one appeared to differentiate the Building with Benches from the rest of the contexts, as bowls (37.5% contribution to this factor) and jugs (11.4 % contribution) are closely associated with the site in the plot. The lumps of unbaked clay also appear associated with this context. All of these artifact groups point to the different nature in this building interpreted as a locus of pottery production, and the results of the CA support this suggestion.

The context of gaming at Maroni *Tsaroukkas* also appears to be related to production. It is an outlier because of the copper production group, which accounts for 59% of the variation in factor two. This points to a distinction between this context and the majority of the spaces that produced games in the ProBA. That the two first-tier sites from Knapp's settlement hierarchy are both represented as outliers and are both closely related to production activities is important for the interpretation of gaming contexts during the ProBA.

Since these two sites contained high inertia values (.658 for Morphou *Toumba tou Skourou* and .315 for Maroni *Tsaroukkas*), another CA was produced excluding these two

sites, in order to determine if there are any differences in the contexts from Maa *Palaeokastro* and Episkopi *Phaneromeni* (Figure VII.60, Tables C.43–C.49). This iteration produced clustering of most of the contexts from Episkopi *Phaneromeni*, with Unit 16 from this site appearing as an outlier, as were the two spaces from Maa *Palaeokastro.* This plot accounts for 53.5% of the variation in the data. It is impossible to make conclusions based on permanently located games, or games in open air spaces, since the sample size is small and clustering is minimal. However, a tentative conclusion could be made that the contexts at Maa *Palaeokastro* in which games were played differed from those at Episkopi *Phaneromeni.* The spaces at Maa were associated with artifacts related to consumption (pilgrim flasks, craters) as well as imported wares (Canaanite jars, Mycenaean III:A vessels), while at Episkopi the spaces were associated with the rest of the artifacts included in the analysis, and, thus, difficult to single out an association with particuar practices. While it is possible that this patterning may reflect the incomplete availability of ceramic information from Episkopi *Phaneromeni*, it should be noted that some ceramics are reported in Swiny's manuscript (Swiny n.d.), which are primarily storage and cooking vessels. Only complete publication of the material from this site can further elucidate the differences that may have existed between gaming contexts at this and other sites.

Episkopi *Phaneromeni:* To determine patterning in gaming within Episkopi *Phaneromeni* (as the final site that produced games from six or more spaces), CA was performed on the contexts at this fourth-tier site in order to compare it, as much as possible, to earlier sites (Fig. VII.61, Tables C.50–C.56). When plotting factor two against factor one (64.9% of

the variation), two potential clusters appear. Cluster A consists of Units 10, 13, and 19, while Cluster B contains Units 12 and 21. Unit 16 appears as an outlier, mostly due to the presence of three receptacles in that space. Cluster A contains both of the partially open air spaces, while all of the others presented here were roofed areas.

While any discussion of the differences that appear in the CA of Episkopi *Phaneromeni* is hampered by the small sample size as well as the unavailability of the complete set of ceramic data, the results of this analysis suggest that Cluster A is more closely associated with the typical range of household level production activities. The contexts in Cluster B appear separately because of the presence of personal ornaments, copper artifacts, and the terracotta figurine. It is difficult to interpret this patterning in a way that makes archaeological sense, and this is likely due to the absence of the artifact types related to consumption of food and drink that typically involved the use of pottery. With the dearth of zooarchaeological evidence from the site (Swiny n.d.), there is no way to identify consumption activities on the site without ceramic data. It is entirely possible that the residents of Episkopi *Phaneromeni* were consuming food or drinks while they played games, but the nature of the data renders these practices invisible. Furthermore, the absence of permanently located games at this site precludes even tentative associations between certain spaces and the kinds of activities that occurred there. Therefore, it is impossible to identify spaces in which games were definitely played with the current dataset, or to make comparisons between Episkopi *Phaneromeni* and Sotira *Kaminoudhia* or Marki *Alonia* other than that they may have been played in similar, at least partially domestic, contexts.

Summary: CA for ProBA contexts, while not as comprehensive as that of the PreBA and containing many caveats, may provide a glimpse of the different contexts in which games were played during this period of greater social complexity. It appears that gaming at the first tier sites Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou* were closely associated with copper and ceramic production activities, respectively. At Maa *Palaeokastro*, a second-tier site, consumption activities accompanied evidence for gaming. The evidence from Episkopi *Phaneromeni* is the most difficult to interpret because of the nature of the available data, but it does suggest a closer association between gaming and domestic contexts. This pattern suggests that games were played in different contexts at first-tier coastal sites than they were in lower-tiered sites, which may be a reflection of different social realities in the different types of settlements. Though tentative, this analysis provides a starting point for future research on the context of gaming during the ProBA. As more data become available, stronger conclusions may be made than are currently appropriate.

Chapter VIII: Social Implications of Gaming in Bronze Age Cyprus

The data collected and analyzed in this program of research allow for insight on social aspects of games, which can be approached from various angles in order to gain a multifaceted view of culturally specific gaming practices. From the artifacts themselves, to their distribution on the site level, to comparison of the context of gaming across different sites, and to chronological comparison over the course of roughly 1500 years, the data provide insights ranging from individual choices to long term societal changes in the practice of gaming. Perspectives on the manufacture of the artifacts themselves, as well as from their use, discard, and reuse inform questions into liminality, engagement with contingency, and production of identity and prestige related to games. The interaction among games, space, and humans must be approached as a whole to make conclusions about the sociality of games in Bronze Age Cyprus.

On the level of the individual, data regarding the form of the gaming stones themselves point to choices made and preferences of those who were producing games on the island. Such choices take place within a pre-existing societal context that, to a certain degree, shapes individual choices. Peculiarities in choice of material, patterning in intact versus fragmentary gaming stones, and post-gaming use can provide insight into the "social lives" (Appadurai 1986) of games on Cyprus. At the site level, differences in choices relating to individual artifacts can be compared as Cypriots made different decisions based on their environmental and local cultural realities. Insight into the places and practices in which games were played can also be understood by exploring the

reasons why these choices were made and how those choices affect the play of games in particular social settings. The nature of gaming paces, coupled with the results of site-level CA that measures difference in the types of activities associated with gaming, provide the first step toward understanding whether grounding or contingency were the focus of play. This allows interpretations about the ways individuals attempted to manage contingency for their own benefit. Examining these phenomena across sites on the island-wide level, utilizing the results of the PreBA and ProBA analyses individually reveal a wider range of possibilities for Cypriots to engage with the contingency of gaming within broader social processes that can be better seen on a regional, rather than a site, level. Finally, comparison between the realities of gaming during the PreBA and ProBA shows possibilities in how the consequences of identity maintenance and construction through the manipulation of semiotic contingency in gaming practices may, in tandem with other social processes, lead to social change. In turn, new social realities produce different strategies for gaming, as individuals harness the performance of gaming in new ways to cross increasingly complex social boundaries. Contextualizing the data in such a way allows for a fuller understanding of how games were harnessed to negotiate everyday realities and the diachronic changes they may have had on societies as a whole by facilitating or resisting wider social change.

1. Materiality and Social Lives of Games

Considerable archaeological focus continues to be given to the relationship between people and the material world, as researchers increasingly discuss how artifacts are integral to and, indeed, shape, human action, and (Gosden and Marshall 1999: 169;

Meskell 2005a). Hodder takes another approach, and argues that the "source of transformation and constraint in human society is not in the material facts of existence but in the dependencies between humans and things" (Hodder 2012: 97). Defining a "thing" very generally as consisting of the very basic aspects of entities—"they exist as contained and definable" (Hodder 2012: 7)—Hodder argues that not only do humans depend on things, but things also depend on humans as well as other things. The sum of these dependencies (as well as the dependency of humans on other humans) is entanglement, and "in our dependence on them we become entrapped in their dependence on us" (Hodder 2012: 88). He vividly describes this relationship using the example of a bicycle, where the movement of the bike, in motion, is dependent on the rider, but also on the adequacy of the surface on which it is being ridden, and while the bike provides the rider with new ability of movement, one is also trapped by the movement of the bike and they have to work together to continue this state due to their entanglement (Hodder 2012: 110).

Board games are a type of playful action that are particularly amenable to this kind of theoretical approach because of the material component that is required: the game itself is realized through the manipulation of objects to produce a previously determined goal. To examine the entanglements between board games and humans, the dependencies between humans and the game boards themselves, between game boards and other things, and between the game boards and humans must be explored.

Humans depend on board games: Archaeologists have employed many approaches to studying the ways in which humans are dependent on material objects in the construction

of their social worlds, perhaps the most influential of which is materiality, which focuses on how things act in the world (Hodder 2012: 30). Exploring the cultural relationships between objects and humans, approaches to materiality argue that humans and things are inextricable from one another in the social realm (Appadurai 2006; Johnson 2010; Knapp and van Dommelen 2010; Meskell 2004, 2005a, 2005b; Renfrew *et al.* 2005) and some argue that things have a kind of secondary agency given to them by humans, which allows things to become a kind of social actor (Dobres and Robb 2000; Gell 1998; Robb 2005). As noted by Meskell (2004: 7), "persons exist and are constituted by their material world: subjects and objects could be said to be mutually fashioning and dependent." While most discussions of materiality are social approaches to material culture, increasing focus on the properties of the materials themselves (and, therefore, the choices made to produce objects out of certain materials) provide further insight into the relationship between humans and objects (Jones 2002, 2004; Michelaki 2008; Tilley 2004).

One of the ways of approaching the sociality of things is through examination of their cultural biographies. Such approaches explore the processes by which objects change their social meaning, based on the interactions and histories associated with them (Appadurai 1986; Kopytoff 1986). Such descriptions trace the possibilities of social meanings of artifacts from their production through their removal from use and, in some cases, to new meanings as museum objects (Gosden and Marshall 1999; Rainbird 1999; Weiss 2005). Such biographies, when discussed broadly, can present "the range of biographical possibilities that the society in question offers" (Kopytoff 1986: 66).

Steel (2013: 190–2) offers a cultural biography of a gaming stone from the site of Aredhiou *Vouppes,* focusing on the specific biography of a particular artifact that offers a range of changes in social context. This object demonstrates a considerable number of changes in its biography: from appropriation of a rubber intended for use on a quern for grinding grain, to its use as a *senet* game, its incorporation into a wall as building material and finally its newest role as a museum object. This examination is an important expansion of the study of games on Cyprus, the present study expands this work to explore a wider range of possibilities of the social meanings of games in Bronze Age Cyprus.

In exploring the evidence for production of gaming stones, it is apparent that choices were being made by Cypriots, which may show preferences for materials that could give these artifacts specific properties that they valued for the game itself. As mentioned in Chapter VII, there was a strong preference to make games out of locally available stone, particularly limestone, but igneous stones were used on occasion where it was easily accessible (i.e., at sites in the Troodos foothills). When compared to their foreign counterparts, the Cypriot games appear very similar to their contemporaries in the Levant, where locally available limestone was also used to produce local versions of Egyptian *senet* (Dunand 1954: 310; 1958: 505, 531, 573, 661; Fugmann 1958: 76, 80; Lee 1982: 171–4; Oates 2012; Rast and Shaub 2003: 636–7; Sebbane 2001; Shai *et al.* 2014: 38).

Differences appear when compared to the contemporary Egyptian games from which the Cypriot versions are derived, as well as when compared to Mesopotamian games that, while not directly related to the Cypriot games, were part of the broader Near

Eastern cultural milieu. The boards for these games were typically carefully manufactured out of materials such as ivory, faience, wood, or stone, and often comprised of multiple materials, as decoration or playing squares commonly were inlaid—e.g., the game from Tomb M1 at Abu Rawash in Egypt (Montet 1946: 185) and the multiple examples of the Royal Game of Ur, from the Royal Tombs at Ur in Mesopotamia (Becker 2007; Woolley 1934: 274–9). Looking at games contemporary to PreBA Cyprus from Egypt (Early Dynastic, Old and Middle Kingdoms) in Piccione's catalog (1990a: 382–451) of Egyptian *senet* game boards, nineteen boards were manufactured from stone (including thirteen incised in stone pavements), while four were probably made of wood, but only their ivory square inlays survive. Preservation, of course, is a potential factor, even in the Nile Valley, since, when later games are considered, wood is predominantly the preferred medium for their manufacture, with 34 examples known. It is entirely possible that wooden games were more common during the earlier periods, and a wooden *senet* board is attested in an offering list of Prince Rahotep (Petrie 1892: pl.13), as is a wooden *mehen* board in a scene depicting a carpenter's workshop (Vandier 1952: 81–2).

While ivory or faience may have been prestige materials unavailable for the production of game boards, wood and stone were plentiful on Cyprus. Flat limestone blocks are readily available throughout the landscape of the island, and such stones have been the building material of choice on the island from the Neolithic until modern times. Wood also was plentiful in the past, and was an important export from the island (Knapp 2013: 398; Moran 1992: 22), and, indeed, during the Bronze Age the presence of charcoal suggests the continued presence of woodlands on the island (Falconer and Fall

2013: 114). Of course, an argument could be made that wooden boards did exist on Cyprus, but they have not been preserved. Evidence for this can be seen at ProBA 2 Kouklia *Teratsoudhia,* where eight faience playing pieces were found in Tomb 104N but without a board preserved (Karageorghis 1990: 65). Inlays found in Tomb 23 at Hala Sultan Tekke (Niklasson 1983: 175–6), Tomb 14 at Kalavasos *Ayios Dhimitrios* (South 1996: 167) and Tomb 1 at Morphou *Toumba tou Skourou* (Vermeule and Wolsky 1990: 221, 240, 332)—the former two accompanied by playing pieces—also were likely incorporated into wooden boards. The presence of these boards may point to the introduction of new games with different entanglements than those existing previously on the island. All dating to the ProBA 2, these boxes are embedded in broader Near Eastern practices of elite game manufacture, and are tied to specific social realities that were not present on Cyprus during the PreBA (see below). Remains of inlays and, indeed, playing pieces, are absent from the archaeological record of Cyprus prior to the ProBA, and so secondary evidence cannot point to the use of wood for the production of game boards at this time.

The distribution of gaming stones within sites on the island further argues for the conscious choice of stone as the preferred material for games. At Sotira *Kaminoudhia's* Area A, single games were found in four of the five major groupings of interconnected rooms, potentially households. The presence of only one game of a certain type is expected within a household context. While it is possible that the household without stone games may have had a wooden game instead, the large number (65) from Sotira *Kaminoudhia* argues against a corpus of games that once existed but which have now decomposed. The patterning at Episkopi *Phaneromeni* is similar, although the poor state

of preservation of the architecture makes the identification of households difficult. Again, the large number of stone games from this site, particularly with regard to the smaller extent of the excavation that at Sotira *Kaminoudhia*, argues against a considerable portion of missing data. The evidence from Marki *Alonia* and Alambra *Mouttes* is more equivocal, but 50% of the completely excavated structures at the latter produced stone games. Many of the compounds at Marki *Alonia* did not produce games from their habitation levels, but those that did only produced one per level in a compound (e.g., Compound 7, which produced three games, but they were distributed one apiece in Phases D, F, and H), supporting the argument that one game per household was a typical pattern. In any case, the large number of games from Marki *Alonia* (44) also argues against a considerable number of missing boards due to lack of preservation. It is important to note at this point that the number of games from excavated PreBA sites in Cyprus (188) exceeds the total number of games found in all of Pharaonic Egypt, with its excellent climate for archaeological preservation (Crist *et al.* 2016a: 74). This suggests not only that these games were popular on the island, but also that stone likely was the preferred material for games while perishable materials, most notably wood, were probably not chosen.

The materiality of game boards, and the reasons behind the preference of certain materials, has largely been overlooked in the literature on games. Malaby (2003: 65–6) discussed the preference of wooden boards over boards of softer materials, such as those with leather surfaces, by *tavli* players at Chania in Crete. Their choices were oriented toward the production of sound through the act of playing, whereby players slapped heavy playing pieces on the board, using the sounds of play to signal their status as

players of greater skill not only to their opponents, but also to spectators and nearby patrons of the coffeehouses in which the game is typically played. The choice of a wooden board maximizes the ability of the players to harness the social performance of the game for the purpose of controlling perceptions about them and their (perceived) ability to steer the contingencies of the game in their favor. The choice of material for a game board can, thus, enhance the social experience of the game itself, and through the use of the material properties of a board in the social performance of the game, humans create a preference for those materials as the performance becomes integral in succeeding at gaining prestige through the semiotic contingency afforded by the game. Observations about the harnessing of sound produced during the play of mancala in Africa suggest the choice of materials for boards there followed similar logic (de Voogt 1997a: 36).

African mancala boards were also purposefully manufactured out of certain materials reflecting cultural preferences, status signaling, and the choice of material properties that both provide a more pleasurable playing experience and produce visual, tactile, and material correlates of an object's biography. While mancala boards were commonly carved into exposed bedrock or tree roots, as well as scooped out of sand or soil, materials were intentionally chosen to manufacture portable game boards, which would convey status on the person or group to which they belonged (Walker 1991: 142–8). Materials chosen for their prestige, often by elites that owned boards meant for display, range from gold or copper alloys to ivory or particular species of wood. The counters used to play the game on the board also could be made of prestige materials, including iron and imported coral beads. In other instances, where boards are not being manufactured as items for prestige display, wood is the preferred material because of the

wear patterns produced through repeated use. The wood becomes smoother through repeated play, the holes where the counters are placed widen, in some cases developing finger grooves, and the wood develops a shine (de Voogt 1997b: 151). The changes all occur as the result of repetitive use through contact with players' hands and the counters used in the game. Appreciation of these boards is experiential rather than visual; it is obtained in feeling the ease of play afforded by the wear patterns, allowing for greater "playing value" (de Voogt 1997b: 151). Use wear has the opposite connotation for prestige boards, which are rarely actually used for games, and wear diminishes the value of the object (de Voogt 1997a: 30-1). For these objects, it is the visual properties of the material that are important, rather than the tactile properties of played boards. Boards can, thus, have multiple functions: as "prestigious object and political signifier, as a site of encounter, as an artifact bearing evidence of cultural history and personal memory, as an object of value and as a facilitator of game play" (Lacey and de Voogt in press).

What, then, were the properties of limestone that led to its preference for making *senet* and *mehen* boards on Cyprus? The archaeological record of PreBA Cyprus provides few clues to the social value placed on limestone on the island. Locally available limestone blocks were the building material of choice for domestic architecture, which received little shaping before their incorporation into structures (Coleman *et al.* 1996: 23–4; Frankel & Webb 2006a: 7; Swiny *et al.* 2003: 59). The only gaming stones made from non-local materials were five calcarenite games from Marki *Alonia*. The closest source of this material was 10 km away (Xenophontos 1996: 18), but it is unclear whether this type of stone was sought out specifically for these games, or if they were reused or leftover building material. While earlier periods demonstrate a tradition of

stone carving, PreBA Cyprus provides little evidence for the use of limestone as a medium for non-utilitarian objects, aside from occasional pendants (Frankel 1983: 96; Frankel and Webb 2006a: 243–4; Swiny *et al.* 2003: 230–1), figurines (Falconer *et al.* 2014; Gjerstad *et al.* 1934: 145), and rough relief sculpture on *dromoi* of tombs at Vounous and Karmi *Palealona* (Webb and Frankel 2010: 189–91; Webb *et al.* 2009: 85, 128–34). Metal and ceramic objects received far more attention to detail than stone objects and seem to have been more valued as media for artistic elaboration and, perhaps, prestige (Giardino *et al.* 2003: 392; Knapp 2013: 302–3, 333–4; Peltenburg 1994; Swiny 1997: 205–6). While finer stonework appeared on the island during the ProBA, the quality of craftsmanship, execution, and method of production of gaming stones differ little from PreBA examples.

As determined from the analysis of reconstructed weight of games, in some cases limestone was chosen to make game boards that seem to have been meant to remain in one place. In most areas of the island, limestone would have been the heaviest material readily available, with the exception of igneous stones in the Troodos massif. Limestone seems to have been chosen over other types of stone due to its workability. Even those gaming stones that were not interpreted to be immobile were often still of considerable size and weight, with a median weight of 3.69 kg and as heavy as 11.25 kg. Weight was often a consideration for African mancala game boards because of added durability (de Voogt 1997a: 35) but also for added stability of the board itself (Alex de Voogt, personal communication). One may also surmise that there may have been a consideration for the sound made while playing the games, as pebbles —which have been suggested as a likely

form that playing pieces took (Coleman *et al.* 1996: 176; Swiny 1980: 65)—may have produced a desired sound when used on a limestone surface.

Some gaming stones were re-appropriated from a range of artifacts, including querns, rubbers, and anchors. In some cases, such as the stone anchor from Maroni *Tsaroukkas*, it is impossible to tell which function came first: the game or the anchor. For others, such as the rubber from Aredhiou *Vouppes*, the rubbing that created the flat surface on which the *senet* pattern was pecked had to have existed before the game pattern was created. Nevertheless, whether a game was incorporated into a previously used artifact, or whether the game itself then became repurposed for another use, the previous function of the object was readily visible, and it is possible that significance was attached to such artifacts, though the meanings remain elusive (Steel 2013: 191). There is, however, no evidence for any social meaning that might have been attached to these games, as all known examples are in secondary context.

Whatever the choices that were made for the manufacture of gaming stones, it is clear that at least some of these decisions were made to facilitate the sociality of games, to allow people to use these artifacts in social settings. The weight of limestone allowed for the manufacture of immobile games, some of which were placed in unroofed spaces (such as Units 4 and 12 at Sotira *Kaminoudhia*) or in thresholds abutting communal areas (such as the thresholds at Maa *Palaeokastro*). Often, gaming stones were made to be portable, but still having sufficient weight to provide a stable playing surface. One might imagine the slamming of game pieces on the board by players, as part of the performance of play described both for *tavli* and mancala, requiring a board that could accommodate

vigorous gestures while allowing playing pieces to remain in place within the depressions.

Once manufactured, the board becomes a locus allowing for human interaction between two people and any spectators that may be involved while in use. The importance of the board as an artifact is that it requires at least two people in order to function and for them to interact with one another while using it. The variety of interactions that happen, which can be among friends, acquaintances, or even complete strangers, are not limited to the strict execution of the rules of play. As Malaby (2003, 2007) stresses and de Voogt (1997a: 36) mentions, other kinds of interactions occur while in the course of play. During *tavli* games in the city of Chania in Crete, players as well as spectators engaged in taunts, exclamations, and gestures, as self-presentation is a key part of succeeding in winning the game, both practically through disrupting the opponent's attention, but also in the perception of spectators and/or others in public gaming spaces (Malaby 2003: 60–1). These actions reflect the attempts of the players to manipulate semiotic contingency (Malaby 2007: 108), that is, the unpredictability of meaning that accompanies the results, toward their favor to maintain or build reputations and prestige.

Board games depend on things: In addressing the relationship between humans and things, it is also important to realize that things exist in a "web of functional relationships in which things are encountered in their interdependent functions and in terms of their relevance to what we are doing" (Hodder 2012: 41; also Guignon 1993: 10). While humans use game boards as tools to facilitate interaction, the boards cannot function as a game without other material things to contrive a game. In Bronze Age Cyprus, a board is

merely a block of stone with a series of depressions without a function if nothing is moving through the spaces of the board. The agents of movement—variously termed playing pieces, gaming pieces, counters, pawns, or draughtsmen ("playing pieces" will be used for this study)—are vital in transforming a block with depressions into a game. Indeed, the purpose of a board game is to produce an agreed-upon desired pattern in the pieces that are moved on the field of spaces, thus winning the game. Many board games introduce chance into the course of play, and some kind of randomization device is often used along with the board and playing pieces to determine the movement of the playing pieces. Separately, these artifacts may not have meaning, but their dependency (Hodder 2012: 51) on one another creates meaning and social action when they are brought together.

Identifying playing pieces and randomization devices in the archaeological record of Bronze Age Cyprus is difficult. Playing pieces found in Egypt, Mesopotamia, and the Levant are somewhat easy to identify, as they are often conical or spool-shaped and are easily comparable to playing pieces seen in artistic depictions (particularly in Egypt) and modern examples (Crist *et al.* 2016a: 64–7; Nash 1902; Towry-Whyte 1902). This artifact type is conspicuously absent from PreBA Cypriot contexts, though they do appear at a handful of ProBA sites: Kalavasos *Ayios Dhimitrios* (South 1996: 167), Hala Sultan Tekke (Niklasson 1983: 175–6), Kouklia *Teratsoudhia* (Karageorghis 1990: 65), Maroni *Tsaroukkas* (David Sewell, email 5/11/2012), Kition *Kathari* (Karageorghis and Demas 1985: 142) and Enkomi (Dikaios 1971: pl. 165, 24).

These playing pieces arrived on the island during the PreBA 2, at the same time as Near Eastern style game boxes like the three known from Enkomi. Indeed, the game

pieces from Hala Sultan Tekke were found with the fragments of ivory inlays that were likely once a game box, as well as with an astragalus. Playing pieces of this type are ideal for playing on boards with a flat playing surface, i.e., when the fields are delineated by inlaid or inscribed squares or rectangles, rather than a series of depressions, as they rest upright on such surfaces and their conical shape makes them easy to grasp.

The use of depressions, in contrast, is more accommodating for playing pieces that have round bottoms, as such objects will rest in place in the cupules. It has been suggested that seeds, pebbles, shells, or other small round objects would make good candidates for playing pieces used on Cypriot boards (Swiny 1986a: 48), and this is confirmed ethnographically, though this list can be expanded to any small round object from manufactured round pieces of ivory, iron, or plastic today as used in African mancala today (de Voogt 1997a: 36–7; Rollefson 1992: 2; Walker 1991: 148) to dried goat dung for traditional games in modern Cyprus (Michael Toumazou personal communicationzx). Of course, seeds or goat dung would not survive archaeologically, but pebbles and shells would, though the ability of an archaeologist to locate and identify them as playing pieces is hampered by their identical appearance to naturally occurring pebbles or shells used for other purposes, or not used at all. Identification of a cache of gaming pieces could be possible in a tomb, but none has yet been identified on the island. Two small, intentionally shaped pebbles were identified as playing pieces at Alambra *Mouttes*, since they "sit securely" in the depressions of gaming stones from the site (Coleman *et al.* 1996: 176). Three small round pebbles of orange chalcedony were also found at Sotira *Kaminoudhia* in different spaces that were of appropriate size for playing pieces (personal observation). These objects were not collected, as there is no way to

ascribe to them a gaming function merely because of their suitability for it. In the Levant, where boards exist that incorporate both depressions and incised squares, it is likely that people produced these boards to allow for play with both flat-bottomed playing pieces to place in the squares as well as round playing pieces that would rest in the cupules.

Complete sets of playing pieces are rare in the archaeological record, even when associated with a board in an undisturbed tomb. Indeed, the Enkomi game box was not found with playing pieces, and they were likewise absent from many Egyptian game boards. Indeed, it is unclear whether even the game boxes from the tomb of Tutankhamun contained full complements of playing pieces. The one game box to have contained what appears to be a set was game box 585r, which contained two sets of five playing pieces, along with a set of two astragals (Tait 1982: 29–30). The Third Dynasty tomb of Hesy-Re at Saqqara in Egypt depicts complete sets of playing pieces for both *mehen* and *senet* accompanying their boards in a tomb painting, which suggests that *senet* was played in Egypt with two sets of seven conical playing pieces, and *mehen* with six sets of six colored balls with six couchant lion playing pieces. Complete sets of either type have never been found in Egypt (Crist *et al.* 2016a: 24–6; Kendall 2007). Indeed, sets of five pieces, rather than seven, were found in the tomb of Tutankhamun (Tait 1982: 44–7), suggesting that these are complete sets for the game of twenty squares that appears on the opposite face of the *senet* boards. In one unique case, what appears to be a complete set of pieces for an unknown board game was found in a subsidiary grave in Mastaba 3504 at Saqqara (Emery 1954: 31), probably originally contained in a bag, in place of the missing skull of the interred. A board, presumably belonging to the same set as the playing pieces, was placed along the spine of the skeleton.

In any case, we cannot be certain that *senet* or *mehen* were played on Cyprus with similar numbers or types of playing pieces. Indeed, conical or lion-shaped artifacts are absent from PreBA Cyprus, and it appears that ProBA playing pieces were used exclusively for the game of twenty squares, which was introduced at the same time and was played on a flat, rather than a pecked, surface suitable for these flat-bottomed objects. Dikaios (1971: 884) proposed that small clay balls, some of which are inscribed with Cypro-Minoan characters, found at ProBA sites such as Enkomi, Kition *Kathari* (Karageorghis and Demas 1985: 243, 247), and as far away as Tiryns in mainland Greece (Vetters 2011), may have had a gaming function, suggesting something akin to the modern games of marbles. They are generally of an appropriate size to be used as playing pieces on Cypriot style *senet* or *mehen* boards, but, as in the case of spherical stone pebbles from Sotira *Kaminoudhia* and Alambra *Mouttes,* they cannot be assigned a gaming function based on their suitability alone. At this time, no evidence exists to connect them with *senet* or *mehen* on the island.

There are several possible explanations for the absence of complete gaming sets in the archaeological record. Playing pieces could be made out of perishable materials or overlooked as candidates for such interpretation (in the case of pebbles or seeds). Another intriguing interpretation is that gaming sets are a modern conception stemming from the commercialization of board games packaged together as a set. Playing pieces also could have been personal to their owner instead of being a part of a set. Differences in patterns of board ownership for African mancala, where in some cases boards were communally owned (Walker 2007: 250–1) could have interesting implications, where players may have their own sets of playing pieces they bring when they play. In many cases, playing

pieces would not be curated artifacts and, instead, used on an *ad hoc* basis, particularly when used on games that appear as graffiti (such as the *senet* pattern found pecked into bedrock at Dheneia *Kafkalla).*

In addition to playing pieces, randomization agents may also be an integral material component of a game, as many games require a method for determining the movement of playing pieces on the board. In Egypt, *senet* appears to have required the use of such objects, as a set of four casting sticks appear with the *senet* playing pieces in the tomb of Hesy-Re (Quibell 1913: pl. XI), and two pairs were also found in the tomb of Tutankhamun (Tait 1982: 36). Throwing sticks were the most popular randomization device used in Egypt from the Predynastic through the New Kingdom and are still used in Egypt and Sudan today (Crist *et al.* 2016a: 6–9; Kendall 1982: 271). They typically consist of four "sticks," which can be made of wood, reeds, or precious materials, with one side differentiated from the other (either one side decorated and the other blank, or one flat and one round side). The four sticks are cast together, and the resulting pattern of face-up sides corresponds to a culturally specific number for movement. Such artifacts have never been found from archaeological contexts on Cyprus, though they could conceivably have been made of perishable materials as they commonly are elsewhere.

Another randomization device that was popular in antiquity was the astragalus (or astragal), the talus bone of a hooved animal, typically a sheep or goat, with four distinctly shaped sides that can land face-up when cast (Gilmour 1997). Much like seed or pebble playing pieces, astragali (or astragals) can be difficult to identify in the archaeological record as they may also be present as evidence for animal butchering (Reese 2000: 398). Nevertheless, in some cases astragali were either modified or copied in other materials,

indicating their use for gaming. It is important to note, however, that the rolling of astragali, much like dice, can be its own game in and of itself without the need for a board or playing pieces, so the presence of astragali does not necessarily point to the presence of decomposed boards or playing pieces.

The earliest manufactured astragalus on Cyprus comes from a ProBA 1 tomb at Nicosia *Ayia Paraskevi* (Krumholz 1982: 278, 281, 299–300). It is a copper (or bronze) artifact that was found alongside two natural ovicaprid astragali. Another from Enkomi (Dikaios 1971: 241) was ground down on one side and covered in green paint. Thirty-one ground but unpainted examples were also found at the site (Dikaios 1971: 631). At Hala Sultan Tekke, four astragali were found with ground sides (Reese 1985: 385), as were "a number" of the 56 found at well TE III at Kouklia (Reese 1985: 385; Halstead 1977: 271) and seven from tombs at Kouklia *Teratsoudhia* (Reese 1990: 144–5). Only one astragalus is known to have come from the same context as other gaming material, from Tomb 23 at Hala Sultan Tekke with faience gaming pieces and ivory box inlays already mentioned above (Niklasson 1983: 175–6). The astragalus and playing pieces were found together next to the ivory inlays, which were laid at the feet of the skeleton, and appear to have fallen out of the game box after deposition.

Currently, astragali that can be identified as gaming material are absent from the archaeological record of PreBA Cyprus. Modified astragali have been found in the Near East and the Aegean, with Neolithic examples known from Knossos (Evans 1964: 236; Reese 2000: 398), Chalcolithic Anatolia (Muscarella 1974: 80–1), second millennium BCE Ur and Nuzi (Woolley and Mallowan 1976: 198; Starr 1939: 378–9, 414), as well as from the Levant (Bienkowski & Reese 2002; Gilmour 1997: 167–8). Earlier and

contemporary evidence, thus, shows the use of astragali in neighboring regions, but they remain absent from Cyprus until the ProBA. It may be possible, then, that throwing sticks made of wood, reeds, or some other perishable material were likely the preferred randomization agent for *senet* on the island, similar to the contemporary evidence from Egypt suggesting their use for *senet* there. *Mehen* does not appear to have required a randomization agent, unless the throwing sticks shown in the painting of Hesy-Re were understood to be a part of the *mehen* paraphernalia as well. In any case, throwing sticks have only been found with *mehen* playing pieces when they occur in the same context as *senet* playing pieces in Egypt (Crist *et al.* 2016a: 24–5), further confusing the issue. Nevertheless, the use of astragali in PreBA Cypriot gaming practices is not indicated by the archaeological record, but they do appear to have been popular during the ProBA, perhaps as a newly introduced foreign practice along with the game of twenty squares, both appearing in elite coastal sites at this time. Astragalus playing may be its own game (or, potentially, used for divination), but these objects, in some cases, were likely also used as the randomization agents of choice for the game of twenty squares (Finkel 2007: 21). A similar process has been suggested for Egypt, where the use of astragali was not popular until after the Seventeenth Dynasty, in parallel with the introduction of the game of twenty squares there (Finkel 2008).

In examining the dependencies between game boards and their paraphernalia, it is possible to begin seeing, in some ways, how these relationships "pull, channel, and constrain humans and their goals" (Hodder 2012: 58) with respect to semiotic contingency and harnessing the sociality of games to build and maintain identity or prestige. While the act of playing *senet* or *mehen* affords types of interactions that are not

possible outside of the game, due to their liminoid nature, the possible performances necessary to signal one's control over the game in order to convey mastery over contingency is determined, facilitated, and yet limited by the playing pieces and randomization agents used. Randomization devices function, somewhat, as equalizers for games by introducing a degree of chance. In games that involve primarily strategy, for example in chess, an experienced player may easily overcome a novice, whereas a game that includes a degree of chance allows even novice players the possibility of winning against a more experienced player. This is not to say that strategy and skill with a game is not a crucial part of winning a game, as, indeed, it typically plays a greater factor than chance (Malaby 2003: 59–60, 62; 1999). Introducing chance allows for increased contingency, since the potential exists for skilled players to lose to novices. At the very least, it introduces the illusion of greater chance of a novice overcoming an expert at the game, which, in itself, facilitates interaction between two such players. The increased contingency in a liminoid practice such as gaming may further help to perceptually blur social boundaries between players, as players are both given a chance to manipulate semiotic contingency and build their prestige through their performance in the game. Of course, the idea of chance as a purely mathematical property was not held in all societies, and the connection between random events, specifically related to dice or astragali, and divination, is well attested (Johnston 2008; Santangelo 2013, Sutton-Smith 1997: 55–8). In such cases, it is possible that performances which successfully align with chance events can be imbued with higher level meaning that may be more effectively mobilized for prestige.

In games where randomization devices are not used, as may be the case for *mehen,* considering the Egyptian evidence, contingency still exists but perhaps in a different way. Without the use of casting sticks or astragali, skill or strategy then becomes the method by which a game is won. This can be more readily assessed and prestige can be better assigned by spectators and opponents, as the perception of chance is removed from the outcome of the game. Alternatively, in cultures where chance may be seen as deriving from favor (or disfavor!) from a supernatural source, games of pure strategy may hold less impact on prestige perceived to derive from such a source. No indications of such beliefs exist in Cyprus, in contrast to evidence in the Korykeion Cave on Mount Parnassos in Greece, where 22,781 astragali were found, many inscribed with the names of gods (Amandry 1984: 347–8, 363, 370). Of course, performance may still be a key part of the game event where chance plays a less prominent role, as opponents may still attempt to intimidate and each other.

This performance can be enhanced or restricted by the interactions between the playing pieces and the board, as facilitated by humans. As already mentioned, the materials of game boards and their playing pieces may have been, in part, due to their qualities that allow for a performance of play to convey skill, even when certain outcomes are only the result of chance, such as when players cast randomization agents with a flourish or call for a favorable outcome (Malaby 2003: 64). Restrictions on the execution of the performance can be seen in the shallow depressions (usually 1–2 mm) on the boards, which may not allow for exceedingly vigorous slamming of pieces as it would cause other playing pieces to be jarred from their positions. Humans are bound by the

limitations of interactions between the board and its paraphernalia as they attempt to harness or counteract these dependencies through their action.

The material entanglements between things for Cypriot *senet* and *mehen* games extend beyond the local, going back to their first adoption on the island and to their origin in Egypt. The choices and encounters that were made along the way, which brought a visually very different type of artifact to a new form on a far away island, caused these changes and brought about different kinds of interactions with those games as they entered cultures with different sets of material, environmental, and cultural entanglements. Discussing the reasons for change in the cultural practice of *senet* and *mehen* as it was exchanged between Egypt, Cyprus, and the Levant is not the focus of this research, but it is important to know that even though the transmission of *senet* and *mehen* may have occurred 1500 years before a particular board was played in a ProBA context, the people using them, though they may not be aware of it, are entrapped in that entanglement of great historical depth. This "forgetness" (Hodder 2012: 101–3) of things is one of the reasons humans are entrapped by them: we interact with them on a non-reflective level, taking them for granted, though they have connections and dependencies with "implications and consequences of which people are not aware and which may be unintended" (Hodder 2012: 103; also Giddens 1979).

Intercultural entanglements are more proximal for the game of twenty squares on the island, as it appears in a form that is often nearly identical to other examples in the Levant and Egypt. Decorated in the "International Style," (Caubet 1998; Feldman 2002, 2006; Feldman and Sauvage 2010), the game boxes from Enkomi are entangled in the shared cultural milieu (Gosden 2004: 30–3) of the Eastern Mediterranean, involving gift

exchanges between elites throughout the region (Steel 2013: 51). Existing in this web of entanglements, the game of twenty squares always appears separate from Cypriot *senet* and *mehen*, both in terms of context and morphology. *Senet* and *mehen* games were not made of luxury materials in emulation of the game of twenty squares, and neither was this game made as a series of depressions in the traditional Cypriot manner of producing games. As Hodder (2012: 207) points out: "Things evolve and transform because they are fitting within particular entanglements," and "there is an irreversibility to entanglement," and so we see this reflected in the material of *senet*, *mehen*, and the game of twenty squares on the island. *Senet* and *mehen* were made in a certain way, and even though the introduction of new possibilities for game board manufacture on the island were introduced, they are not "coherent" (Hodder 2012: 113) across their different webs of entanglement, and thus do not become incorporated into the same networks of manufacture, performance, and play. Twenty squares and its play are, thus, entangled with broader Eastern Mediterranean elite practice, while Cypriot *senet* and *mehen* remain entangled in local practice.

Board games depend on humans: Things depend on humans not only through the act of production, but also because they are not inert: they are always falling apart, transforming, growing, changing, dying, running out (Hodder 2012: 65). Matter is "continuously emergent" (Edensor 2011: 238), and a multitude of forces act on objects to transform them physically, from interactions with the environment, other objects, and humans. Humans are drawn deeper into their entanglements with things because objects depend on humans to maintain them as people want them, as well as to "maintain the

environments in which they thrive" (Hodder 2012: 86). This means that, as humans have to take actions to curate, repair, replace, and prevent damage to objects, they are entrapped in increased labor and social debts as they attempt to mitigate the temporality of objects.

The manufacture of stone game boards in Cyprus makes the assessment of mechanisms by which humans became entrapped by these objects difficult, since the nature of the material, and often the substantial bulk of the artifacts themselves, withstand the forces acting on them through their use. Despite this, some of the stone game boards from Bronze Age Cyprus are broken, or may be worn through use, and discussion of this may further illuminate the entanglements between humans and games. To address this part of the cultural biography of games—the approach to the end of their use as games—it is important to take into consideration the concept of fragmentation (Brittain and Harris 2010; Chapman 2000).

Fragmented objects are those that have been deliberately broken to serve some purpose. Often identified as a kind of ritual breaking (Chapman 2000: 24–6), objects that were possibly purposefully broken in the ancient Mediterranean include Minoan and Mycenaean rhyta (Rehak 1995) as well as "Aegeanizing" wall frescoes in the Near East (Steel 2013: 119–20) and metal objects in PreBA Cypriot tombs (Keswani 2004: 75). The potential that games could have been broken on purpose, whether for a ritual purpose or otherwise, is suggested by the number of broken games and the durability of the material.

Examination of the state of preservation of limestone gaming stones from Bronze Age Cyprus is required to more fully determine which games are fragmentary and which may have become damaged or worn through use. In some cases, the gaming stone

appears to be intact, but part of the pattern of the depressions is missing, as is the case for S18 from Marki *Alonia* (Fig VIII.1) and S1086 from Sotira *Kaminoudhia* (Fig. VII.32), both of which have the full original perimeter of their *senet* pattern, but damage to the artifact has obscured or removed a number of the original depressions. Wear such as this could have happened during the life of the object as a game, but it is equally possible that taphonomic processes were responsible after these gaming stones were no longer used as such. Some games do show evidence for use wear and for subsequent reuse. A particularly telling example is S613 from Sotira *Kaminoudhia* (Fig. VII.15, see Chapter VII), which displays two distinct *senet* patterns on its face. In one pattern, the shallow depressions now run together, appearing almost as channels, though the original ephemeral depressions can still be seen. The other *senet* pattern on this artifact has distinct depressions. It is possible that the running-together of the depressions in the first *senet* pattern was through a long period of use, where the stone gradually wore away with the movement of playing pieces in the depressions, and, once either the playing pieces could no longer be held in place in those depressions, or the cupules were too difficult to differentiate—thus hindering the course of the game—, a new *senet* pattern was created on the same artifact. It may even be possible that the stone was reshaped at the same time this new pattern was created, shaping it into a square with the new *senet* in the center, but with the old pattern still visible. If true, there could be implications for the biography of this object, which inspired those who played on this board to conserve this object, and the old *senet* pattern on it, as it could have been tied to certain people or events, the memories of which are preserved through the conservation of this motif. Another example (S412, Fig.VIII.2) from Episkopi *Phaneromeni* shows *senet* with depressions,

possibly worn through use, on one face, and on the opposite another *senet* pattern, which could reflect a similar choice to continue using the same object as a game, after its utility as such was hindered because it became worn through use. Other games show slight damage around the edges of the stones, which could have been inflicted through accidental breakage during transport or play of the games, sometimes affecting the playing pattern. Such examples include 10412 from Episkopi *Bamboula* (see Fig. VII.24), S232 from Episkopi *Phaneromeni* (Fig. VIII.3), and S529 from Marki *Alonia* (Fig. VIII.4).

Other breakage patterns, which seem less likely to have been the result of accidents, come from gaming stones that are broken perpendicular to the rows of depressions making up their *senet* patterns, or across the center of the *mehen* patterns. The great majority of them were broken perpendicular to the *senet* pattern, or across the *mehen* game. Only in rare cases was there breakage parallel or diagonal to the *senet* patterns, but there is more variety in the breakage of *mehen* gaming stones. In most of these cases, the stone is broken in such a way that it could not be repaired to remain in use as a game: there is simply not enough space remaining on the object to add depressions to make up those that were lost due to breakage (Fig. VIII.5). Because of the durability and thickness of these stones, it is unlikely that so many games were broken accidentally. The patterning of broken games at sites is not surprising, as they tend to come from alleyways where refuse was thrown (e.g., Units 18, 37, 64 at Sotira *Kaminoudhia*) and from episodes of construction and abandonment, as at Marki *Alonia*. This patterning is further explored below, with reference to the discard of broken games in and around units with communal activity at Sotira *Kaminoudhia*. Another example,

AS6 from Marki *Kappara,* had large depressions pecked into both sides of the stone, which rendered the *senet* patterns appearing on each side unusable. It was found in the burial chamber of a looted tomb (Swiny 1986: 36), suggesting a similar ritual "killing" of this artifact as that seen in contemporary metal objects in tombs (Keswani 2004: 75). In any case, this artifact suggests that the breaking of game boards to put them out of use was at least sometimes practiced for mortuary purposes, and broader consideration of the evidence from settlements suggests that it is possible that Bronze Age Cypriots would break their games deliberately. Speculation on the reasoning behind the destruction of these artifacts can range from perceived bad luck or supernatural disfavor attached to the artifact, to destruction of games made for a particular event, or to an angry loser of a game, but these scenarios are impossible to ascertain from the archaeological evidence currently available.

As Brittain and Harris (2010: 588) assert in their critique of archaeological approaches to fragmentation, deliberate breaking of objects does not have to involve enchainment (the process by which the broken objects are used in social exchanges linking them to people and places), and in the case of Cypriot gaming stones, the pattern of deposition, i.e., in places where refuse was typically discarded, suggests that the fragments were not part of social exchanges. Rather, the act of breaking the games may have been to remove the game from use because of perceived hindrances to the intended purpose of the game. As discussed in Chapter III, games are effective at creating social relationships, and so the breaking of a game could occur when the social memory of the use of that board, whether memory held by an individual or by a group, became unfavorable for the continued use of that artifact. Evidence suggests that in some cases,

limestone game boards were rehabilitated as such once they became too worn to effectively play, which could be related to positive social memory related to the game. Malaby's work on Crete suggests that very particular practices related to superstition accompany the play of board and card games (Malaby 2003: 80–1) and this may be one manifestation of that, where boards seen as lucky or unlucky are curated or destroyed accordingly.

Once individual gaming stones were removed from use as games, they could be deposited in alleyways or other areas (such as Unit 64 at Sotira *Kaminoudhia*) where other refuse was typically discarded. In many cases, gaming stones were re-appropriated for use as building material. Gaming stones, both intact and fragmentary, were common finds in the wall debris at Sotira *Kaminoudhia,* a site destroyed by an earthquake and consequently with considerable wall tumble (Swiny *et al.* 2003: 53–4). Games have also been found built into walls at Marki *Alonia*, Kissonerga *Skalia*, Hala Sultan Tekke, and Episkopi *Phaneromeni*. It has been suggested that gaming stones built into walls at Aredhiou *Vouppes* could have had some kind of meaning for their inclusion into walls, either as personal mementos of the builders or as foundation deposits (Steel 2013: 191; Steel and McCartney 2008: 32), which would make this a particularly common practice in Bronze Age Cyprus. Nevertheless, instances such as that at Hala Sultan Tekke, where three games are visible on the topmost preserved courses of walls bordering Room 22 in Building C (Melissa Samaes, personal communication) may suggest a meaningful placement of these broken artifacts in a certain location, as they are not found in other structures on the site. Gaming stones in walls of Iron Age or later date could suggest that the builders acquired building stone from areas with Bronze Age remains nearby, for

instance at Politiko *Tamassos*, where gaming stones built into walls may have originally been from the nearby site of Politiko *Troullia*, which has produced many gaming stones (Buchholz 1981: 76; 1982: 70; Falconer and Fall 2013: 113). In other cases, such as at Temple IV at Kition, where gaming stones were found built into walls and one was built into an altar (Karageorghis 1985: 150, 279), it is unclear whether the games there were mined from the ProBA settlement, or whether they were chosen because of their historical connection, adding a new stage in their cultural biography as relics.

ProBA ivory game boxes also show some evidence of becoming imbued with meaning, as some of them seem to have been kept for several generations as heirlooms (Ben-Tor 2009), accumulating histories of their own andgaining value through the people and events to which they were connected (Gosden and Marshall 1999: 170; Kopytoff 1986). Using items with such cultural histories, particularly made of ivory, an imported luxury material, and decorated in particular artistic motifs, was important for the legitimization and signaling of identity of these individuals (Knapp 2012: 45), and the fact that these boxes seem to have been used for the game of twenty squares, a newly introduced game from the mainland that was popular throughout the Eastern Mediterranean, also was a method for harnessing identity and legitimizing power.

The most likely candidate for an heirloom is game box 657b from Enkomi. This artifact, found with game box 657a, was discovered in a pit in Room 27 of the Ashlar Building, underneath Floor IIIA (Dikaios 1971: 255), dating to the ProBA 3 (c.1300–1125 BCE). Two boxes displaying the game of twenty squares with nearly identical decoration (see Fig. VIII.6) were found in a storeroom at Kamid el-Loz (Meyer 1986:123-33) in modern Lebanon and in a tomb at el-Asasif in Egypt (Mariette 1889:

17). The Egyptian example comes from a Seventeenth Dynasty (c. 1580–1550 BCE) tomb, and, therefore, perhaps three centuries before the deposition of this Enkomi game 657b (Ben-Tor 2009: 52). Judging from the artistic similarities to these two games, as well as decorative styles on ivory inlays associated with the playing squares found in a ProBA 1 (1700–1450 BCE) tomb at Morphou *Toumba tou Skourou* (Vermeule and Wolsky 1977), game 657b was probably originally made not much longer after the game box from Thebes. What is unclear is the time at which the game actually arrived in Cyprus, as it could have had considerable use on the mainland before it was brought to the island. Nevertheless, an object such as this, which was likely in circulation centuries before it was finally deposited, would have built up a considerable cultural biography, and it is not surprising that it was found in one of the most important elite structures on the island.

Other game boxes, such as those from Hala Sultan Tekke and the other two from Enkomi, show less evidence for their cultural biography, though they were certainly prestige items used by elites, as they were all located in elite tombs or structures and made of ivory. The Enkomi game box from Tomb 58 is the only one retaining any of the original decoration, and it is decorated in a fashion similar to other artifacts throughout the Levant, and probably dates to the thirteenth–eleventh centuries BCE (Caubet 2009: 57).

Summary: Looking at the materiality of games on Cyprus helps to add dimensions to their interpretation that have not been attempted in the past. While the rules of the games are beyond recovery from the past, examination of the choices that ancient Cypriots made

in manufacturing the games, as well as drawing connections with ethnographic accounts of game playing in modern societies, help to give a broader understanding of the performance of play and how the properties of the boards themselves may have been mobilized to signal and build identity and prestige. The performance, involving the exhibition of skill (even when an outcome may actually be a result of chance) as well as the ability to withstand the effects of an opponent's performance (e.g., remaining focused though they may be trying to cause distraction), are as important as the game itself, particularly in visible settings where the players may be under the scrutiny of spectators, or where others present are at least indirectly aware of the performance that is happening. Performance in such settings is integral to the management of semiotic contingency, and attempting to demonstrate control or mastery over it may contribute to prestige and identity. Expanding from the artifacts to the possibilities they give their players to engage with their identities in this way then allows for better contextualization of the games in the settings in which they were played, which is provided by the archaeological evidence and the results of the correspondence analysis, suggesting other activities that occurred in the same contexts as games.

2. Gaming Space: Social Contexts of Games

Building from the entanglement between humans and games, it is possible to make further inferences regarding the importance of games in the building and maintenance of identity and prestige by examining the places and social settings in which the games were played at Bronze Age Cypriot sites. Each of the excavated sites has its peculiarities with regard to the organization of space, but there are wide-ranging commonalities,

particularly among contemporaneous settlements. Comparison of spaces between contemporary settlements, as well as exploring changes diachronically, will help to elucidate the ways in which people engaged with their identities through games. In this section, spaces from PreBA sites are compared first, with ProBA sites following, to draw conclusions about how the perceived control over contingency may have led to changing gaming practices and, potentially, increased prestige.

In identifying games at Bronze Age sites in Crete, Hillbom (2011: 66–67) found that, of the games that were pecked into pavements in palace structures, most were in outdoor spaces, sometimes in prominent positions. Others were placed in corners, near walls, or at the ends of steps. Further drawing on Palyvou's (2002) categorization of Minoan sites, Hillbom found that all of the examples of his 12-Ring game were located in open, public areas with unrestricted public access, "wherever it was convenient to meet and sit down" (Hillbom 2011: 90–91). Similar trends were noted by Finkel (2006: 122) in India, where graffiti games are often found in temple courtyards and other similarly public shady areas where sitting is feasible. Indeed, the distribution of graffiti games in the Forum Romanum and the forum at Timgad suggests that people chose places with high visibility and high probability of social encounters (Trifilò 2011). Such choices may be seen in the light of contingency, and being in a highly visible public place affords more opportunity to benefit from play performance. Spaces for gaming in the Roman world were often highly differentiated, with specific places dedicated to illegal gambling, as well as private spaces dedicated to games of skill, but public gaming reshaped specific public spaces by redefining their use (Trifilò 2011: 329). The location of games \

changes the nature of the space itself, making gaming an integral part of the place, as the permanent location of boards leads to repeated occasions of play at that spot.

Considering Hillbom's findings showing the play of games in open public spaces, Cyprus, during the PreBA, may prove to be a different case as far as the places in which Cypriots chose to play games. Bronze Age sites do not seem to contain unenclosed open spaces (Frankel & Webb 2006b: 311–2; Swiny 1989: 20). Individual households commonly had open spaces associated with them in the form of enclosed courtyards at Marki *Alonia* (Frankel and Webb 2006b: 289), but at Sotira *Kaminoudhia* open spaces appear to be specialized communal areas (Swiny *et al.* 2003: 54, 58; 2008: 48–50). Large open courtyards are known at Politiko *Troullia*, though their relationship to other roofed spaces is not completely understood (Falconer and Fall 2013: 104–5). The excavators of Alambra *Mouttes* suggest that most rooms excavated there were roofed, though portions of Building IV may not have been (Coleman *et al*. 1996: 28, 75). The archaeological evidence from Cypriot sites provides a case for the study of games in non-elite settlement contexts, which may provide better evidence for the everyday play of games than the palaces on Crete.

Prehistoric Bronze Age: The CA for PreBA sites in Cyprus produced three clusters of spaces containing games: Cluster A, comprised of roofed spaces with mostly single games and production activities, Cluster B, with some gaming spaces associated with consumption of food and/or drink, and Cluster C, consisting of gaming spaces associated with specialized activity. As is often true when dealing with the archaeological record, there are some trends that are clear from the data, but interpretation requires a degree of

nuance. This is particularly true with the current dataset, as it likely contains spaces in which games were not played as well as gaming spaces. The spaces in which games were played are key to understanding the ways in which people used the performance of play to mobilize their perceived control over contingency in order to build and maintain identities, prestige, and relationships. However, the possibility also exists that games were played in other kinds of settings without this type of performance, where the play of the game was not harnessed to convey some sort of control over semiotic contingency, but, instead, may have been used with a greater emphasis on grounding. The PreBA contexts examined show a range of different contexts in which games were played, and point to some commonalities and site-specific peculiarities that further elucidate social activity in these communities. Below, each site is discussed individually, to address the possibilities of local variations in game playing, while addressing broader commonalities across the sites.

Alambra *Mouttes*: With only two spaces producing games, there is not much that can be said about the social context of gaming at Alambra *Mouttes*, but there are some indications from the site that may inform interpretations of other sites, as well as the types of events where gaming may have been seen as appropriate.

Unit 10, one of the spaces in Building III, a typical domestic unit at the site, was grouped along with similar domestic spaces from Sotira *Kaminoudhia* in Cluster A of the CA. The game found here was found broken in half and incorporated into a bench—though it is unclear whether it was sitting atop the bench or was built into it—, with opposite sides of the two halves facing up (Coleman *et al.* 1996: 174). It is pretty clear

that this game was not used for play at the time of the site's abandonment, but what is less obvious is if this object was ever used in this spot. This artifact may have been played by an inhabitant of this structure, who intentionally broke it and incorporated it into this architectural feature for some reason. Alternatively, it may have never been played by people living in this structure but was used merely as a building stone and was broken in half either as an accident during the building process or to produce a better surface on the bench. Its appearance in Cluster C of the CA does not enlighten the interpretation, only suggesting that either the game was not played here, or that it was played in this space but not for the engagement of semiotic contingency with identity and prestige building, as it was not a space that would accommodate many people, was not particularly visible, and was not associated with artifacts relating to consumption. Such contexts may allow for a focus on grounding between the opponents, where they could focus on the experience of the game in an environment less concerned with performance.

While it is tempting to classify the spaces from Cluster A as places where portable games were found but not played, it is important to recognize the equifinality of the archaeological record when examining this phenomenon. It is impossible to determine whether games were played in a domestic setting, or whether personal portable games were merely stored in those spaces for use elsewhere. What is clear about both of those scenarios is that it does not point to the use of games in these spaces for a performance of play to be seen by a group of people. Indeed, Cluster A may include spaces encompassing both scenarios. The case of Unit 10 provides an example where it is clear that the game was not in use in this space (at least not at the time the site was abandoned),

but without clear evidence of breakage and reuse, it is difficult to distinguish between such scenarios.

The *senet* game on the threshold between Rooms 3 and 7 of Building I at Alambra *Mouttes* is also difficult to interpret. It is the only roofed space to fall in Cluster C, as it is included with other open-air gaming spaces at Sotira *Kaminoudhia*. These spaces were associated most closely with rubbing and pounding tools, as well as imported small bowls and copper smelting. The placement of this space in this cluster is perplexing and defies good explanation. Both Rooms 3 and 7 were deemed to be roofed spaces by the excavators (Coleman *et al.* 1996: 37–9), in contrast to the other spaces within Cluster C. Building I itself has been interpreted as a rather typical domestic structure, much in the same way as Building III, and yet the CA places it in the same cluster as spaces at Sotira *Kaminoudhia* that have been interpreted as very unlike domestic structures. One potential explanation lies in the data compilation. Since the game is placed on a threshold, and thus not strictly within either Room 3 or Room 7, the artifacts from both spaces were compiled, since the activities of both rooms could be considered to be taking place alongside gaming in the doorway. Since all of the other spaces included in the CA were single architectural units, this peculiarity is likely what caused this anomaly in the output. It is, therefore, difficult to approach an interpretation of this game, as its location may not be fit for this kind of analysis.

A striking result of the compilation of material from Alambra *Mouttes* is the absence of games from Building IV, which appears to have been an area of specialized activity, and the most commonly cited candidate for a feasting space in PreBA Cyprus (Coleman *et al.* 1996: 328; Knapp 2013: 292). Feasting, as has been discussed

extensively elsewhere (see Chapter V), provides an occasion where people engage with their own and others' identities and status. While it affords for the building of group identity, it also fosters the placement of one's individual place within that group, and in some cases allows for the building of prestige for certain members of the community, particularly when they are organizing and supplying the feast. The inclusion of gaming in such occasions is therefore expected, as the accompaniment of games and drinking is well attested in the ethnographic record, and such a gathering of people is an ideal setting for engagement of semiotic contingency through gaming performance because of the increased visibility to larger groups of people. Nevertheless, games are absent from Building IV at Alabmra *Mouttes*. This may indicate that feasting events that took place here did not include gaming, which could be an indication of either regional variations in gaming practice, something about the nature of the feasting that may have been deemed inappropriate for gaming, or no social need for the type of engagement with contingency afforded by games.

Marki *Alonia*: The nearby site at Marki *Alonia* provides a complementary picture of gaming practice in Bronze Age Cyprus. All of the contexts included from this site, including those with portable and immobile games, appeared in Cluster B of the CA. The gaming spaces at Marki *Alonia* are unique in that none of them had multiple portable games—all gaming spaces were interpreted as such because of heavy or fixed games. Indeed, all of the spaces in the CA were in households, and so not likely to be places where large groups of people would gather to play *senet* or *mehen* alongside one another. One space, Unit L, which was not included in the CA because it produced no other

artifacts aside from the *mehen* game found there, was likely partially roofed or open-air (Frankel and Webb 2006a: 46; 2006b: 296). It is the only space not obviously part of a household, and yet it is difficult to interpret because of the lack of archaeological material discovered there.

Two households, Compounds 6 and 7, provide a bit more of a diachronic perspective than is allowed at other PreBA sites, due to the unique stratigraphy at Marki *Alonia.* Games were produced from Phases D, F, and H in Compound 7, and Phases F and H in Compound 6. In both cases, some continuity is evident. In Compound 6, both games, which were of *senet* type, were found in Unit XC, interpreted as a lane approaching the compound from the external corridor. The continuity in space here seems to show a preference for this spot to play amongst the inhabitants, and its transitional nature is reminiscent of threshold games at other sites.

While spatial continuity is not apparent in the neighboring Compound 7, a preference for *mehen* is apparent among the inhabitants of this structure, as the artifacts from Phases D and H display a *mehen* game (S456, the later of the two, is double-sided, with *senet* on the opposite face). *Mehen* was more popular at Marki *Alonia* than it was at other PreBA sites, with a ratio of roughly 1:4 (Frankel and Webb 2006a: 246), but it is notable to find two examples in the same household diachronically. Phase D, which produced the earlier *mehen*, actually predates the appearance of the earliest *senet* games at Marki, which are first seen in Phase E deposits. The inhabitants of Compound 6 adopted *senet* by Phase F, but it cannot be seen in the archaeological record in Compound 7 until relatively late (Phase H). Frankel and Webb (2006b: 300) note the longevity of households occupying this part of the village, going back to its settling, and suggest that

well-established families in these somewhat large compounds with a long history exercised some sort of social dominance in the town. It may even be possible that they were competing with one another, as architectural changes starting in Phase C reflect a change in the relationship between these two households. Originally, they shared an open space between them, but beginning in Phase C the architecture became more segmented, and the two compounds, while adjacent, no longer shared communicating spaces or doorways (Frankel and Webb 2006b: 301). It is possible, then, that they were similarly indicating their own identities in the ludic sphere, with Compound 7 continuing a longer tradition of *mehen* playing even after *senet* was introduced to the island and became more popular than *mehen*, while Compound 6 was a *senet* playing household. Nevertheless, the inhabitants of Compound 7 were not immune to the popularity of *senet*, and had adopted it—alongside *mehen*—by Phase H.

With a relative lack of open-aired communal space at Marki *Alonia*, identification of the ways in which the residents of the village used games to engage with contingency and grounding activities is difficult to ascertain. While the effects of play performance are most easily translated to identity construction in social settings with larger groups of people, it remains a practice that facilitates grounding as joint attentional scenes, allowing for increased familiarity between individuals. Ethnographic evidence, which shows that newly married couples often play board games together on their wedding night (Finkel 2006: 72; Pankhurst 1971; Townshend 1977: 92), indicates that the grounding that takes place during play may happen in private settings as well as public ones. While special occasions, such as wedding nights, are obvious occasions in which grounding takes place, it also happens through everyday play, as individuals play against friends, family, and

acquaintances to maintain or build upon those relationships. Coupled with the evidence from the CA, which connects these spaces to ceramic vessels related to consumption of food and drinks (though not on the level of feasting activity), it may be possible to attribute an association between gaming and eating and drinking at least in household practice.

Sotira *Kaminoudhia*: Not surprisingly, as the site that produced the greatest number of games, Sotira *Kaminoudhia* is the only site with spaces appearing in all three clusters of the CA. Indeed, the types of spaces appearing in these clusters help to highlight some of the problems with equifinality in the archaeological record, but also show that games were played in a variety of different settings during the PreBA.

Cluster A contains a number of spaces from Sotira *Kaminoudhia* that easily could be interpreted as spaces in which games were not played: Units 18, 37, 44, and 56. Unit 10, however, provides a unique case that does not fit the interpretation of the excavator—who notes a considerable amount of small bowls and liquid containers (Swiny *et al.* 2003: 47). Finding six games in a roofed space clustered with other spaces that show no evidence—from the CA or otherwise— for their use in gaming requires explanation. Overall, Area C, of which Unit 10 is a part, is the most diverse of the three excavated areas of the site, with some spaces showing evidence of heavy production, others showing evidence for communal activity, some best interpreted as domestic spaces, and even evidence for ritual activity. What is less understood is how these spaces interacted with one another, as the corridors, which normally bound individual structures elsewhere at *Kaminoudhia*—as well as at other PreBA sites—are absent here. Furthermore, the full

extent of Unit 10 has not been excavated, so perhaps more evidence would change its placement in the CA scatter plot. Nevertheless, its inclusion challenges a couple of ideas: that portable games, when they appeared in the same archaeological context, necessarily point to a place where people were playing games, or that there is a certain kind of culturally specific practice occurring in this space that is not readily apparent from the CA. It remains possible that people in Unit 10 were playing games to engage with semiotic contingency, but it remains impossible to ascertain what specific practices would have been employed. Nevertheless, the interpretation of Unit 10 must remain, at this point in time, as a space in which games were not played.

Spaces that were included in Cluster B reinforce the interpretation of those from Marki *Alonia,* i.e., that gaming spaces in this cluster were places of lower-scale engagement with semiotic contingency and grounding. This can particularly be seen in the case of Unit 4, with a heavy game in the courtyard of the household. Its placement in such a visible position within the household would allow for the signaling of control over semiotic contingency over the course of a game to any of the adjacent rooms within the structure.

Unit 2 is the space that best fits the expected pattern of games alongside other social lubricants in a space facilitating the effectiveness of play performance. Despite this, it falls under Cluster B of the CA, which mostly contains spaces included in individual households, while Unit 2 does not appear to communicate with surrounding structures, with the exception of Unit 25, which forms a sort of vestibule. All indications are that this is some kind of specialized space and, judging from the remains of 92 small bowls found there, consumption of food or drink was likely central to its function. While

it carries a pattern of artifacts that seem to be consistent with other domestic spaces in which people consumed food and drink, the layout, construction, and association of Unit 2 with the buildings around it argue that the space itself differs in some way from the other spaces in Cluster B of the CA. Nevertheless, the CA confirms an association between this space and the consumption activities identified by the excavator and found, to a lesser degree, in the other spaces of Cluster B. Indeed, it provides a case as a location of grounding through the play of games in the company of a number of individuals drinking and eating in an outdoor space of specialized use.

Four of the five spaces appearing in Cluster C were from Sotira *Kaminoudhia*: Units 12, 12a, 12c, and 21, and all of these were unroofed spaces. Except for 12a, they were all interpreted as gaming spaces. The results of the CA associate this cluster with games, ground stone tools, and uncommon artifact types, such as imported small bowls. Unit 21, interpreted by the excavator as potentially an area of animal butchering (Swiny *et al.* 2003: 49), seems to appear in this cluster because of a problem with the available data: while ground stone tools were well-represented in this space, the most notable finds were the large number of animal bones in comparison to other units at the site. Counts for zooarchaeological remains were not available for the CA and, thus, not included in the tabulation of finds, and, therefore, a dominant class of material is absent for Unit 21, hindering its interpretation.

Despite this, the interpretation of the Unit 12 Complex as set apart from the other spaces at Sotira *Kaminoudhia* and, indeed, all of PreBA Cyprus is not a new revelation. The complex has been recognized since its excavation as a unique structure in PreBA Cyprus, likely being of public, ceremonial (Knapp 2013: 288), or ritual use (Swiny *et al.*

2003: 36–7; 2008: 48–50). With features such as a six meter high white plastered wall fronted on the lower course with three massive boulders, and with parallels in coroplastic and other funerary art (Swiny 2008), this complex of rooms divided by low parapet walls provided a structure that could be described as relatively monumental for PreBA Cyprus. While recognizing that it is difficult to distinguish secular public buildings from ritual ones in ProBA Cyprus (Knapp 2008: 241), Swiny provides a compelling argument that the constellation of unusual patterning of finds and architectural features in the context of Bronze Age Cypriot iconography and material culture, point to a ritual use of the Unit 12 Complex (Swiny *et al.* forthcoming), and the CA confirms that it is unlike the other kinds of spaces either at Sotira *Kaminoudhia* or at other PreBA sites.

It is not surprising that games would be found in a potentially ritual space. Play theorists have long likened the act of play to the performance of ritual, and, indeed, in some cases have documented the inclusion of games in all types in ritual contexts, sometimes as the main part of the ritual practices, while, at other times, ancillary to them. Of course, much like games, ritual is a place where humans attempt to deal with contingency through actions that are meant to be perceived as influencing or taking control of unpredictable or uncontrollable events. It may be that games were played as part of the rituals that took place in the Unit 12 Complex, since the five found in Unit 12c were found on a shelf that included other objects related to cult activity (Swiny *et al.* forthcoming; 2008: 50). Furthermore, the large open space provided by the structure, in Unit 12 in particular, allows for gatherings of groups of people in this location.

The multiple games found in Unit 12 suggest that this was a place where people gathered to play, and the inclusion of games in this ritual context is further strengthened

by the discovery of multiple games found nearby, in Units 64 and 13, where much of the refuse from the Unit 12 Complex was discarded. Among this debris were six broken games, which, if intentionally broken as suggested above, may further suggest some kind of purposeful breaking after their use. It is impossible to say whether they were broken as part of a ritual, after their use in the complex, or after an undesirable outcome in the game itself, but it is clear that the Unit 12 Complex was a place in which people gathered to play games. Because of the unusual number of broken games, as well as their placement on the shelf in Unit 12c, it is likely that the games themselves played a part in whatever rituals took place in this complex.

Ritual itself is often a way in which humans attempt to demonstrate control over contingency, and in this way is also much like gaming. Malaby (2007: 96, 105–6) asserts that games are a contrived form of contingency, providing circumstances under which new, unpredictable outcomes can arise and then, through the practice and performance of gaming, individuals attempt to demonstrate their control over these unpredictable outcomes, even though, in many ways, they have none. This is similar to religious rituals, in that they often are attempts to seize control, or give the impression of control, over unknowable future events. In this way, games and ritual are alike in that they are methods to manipulate semiotic contingency, which can have very real social results for those engaging in the game or the ritual..

Other sites: Settlements and cemeteries aside from the three included in the CA offer further glimpses into the social context of gaming in PreBA Cyprus. First among these is Politiko *Troullia,* which has produced a number of games on par with Marki *Alonia,* but

remains insufficiently published and analyzed for CA. Nevertheless, there are indications that games were found in a similar space to those interpreted as communal areas at Sotira *Kaminoudhia* and Marki *Alonia,* particularly the one embedded into the floor of the southern courtyard at Politiko *Troullia* West, which the excavators describe as a communal space (Falconer and Fall 2013: 106). Published results of this excavation are eagerly anticipated, as the attribution of the considerable number of games to particular architectural spaces at this site can only augment the data that exist for other PreBA settlements.

The presence of games in cemeteries adds to the evidence that games were played in social settings. Cemeteries at Sotira *Kaminoudhia,* Bellapais *Vounous*, Marki *Kappara,* and Dheneia *Kafkalla* each produced games, with only Marki *Kappara* producing one from inside a tomb (though the tomb was disturbed and looted). This game, which is different from other *senet* games in that it has well-formed *senet* patterns on both sides, but each is damaged by a large pecked depression in the center of the game, was probably ritually killed, as discussed above. This is not dissimilar to intentional fragmentation of games that was probably happening in the Unit 12 Complex at Sotira *Kaminoudhia,* but the different method suggests another intention that may be connected to its location inside a tomb. The Hadjiprodomou terracotta votive *senet,* said to have been found at Kotchati but probably from a cemetery near Marki (Jennifer Webb, personal communication), also points to the inclusion of games within the mortuary assemblages of PreBA Cypriots. Nevertheless, this votive object and the killed example reflect different social connotations of games when included in burials, whether it was ritual in nature as in Egypt, or merely as personal objects of the deceased.

It is likely that the games from cemeteries at Sotira *Kaminoudhia,* Dheneia *Kafkalla,* and Bellapais *Vounous* were meant for use, or at least were used at those sites, since they are identical in form to games found in settlements, unlike the two known to have come from tombs. Indeed, the *senet* from Dheneia *Kafkalla* was pecked into the bedrock of the cemetery. It has been argued that the most probable interpretation of this game was that it was placed there by the people who dug out the chamber tombs found in this cemetery to play as a sort of break from their arduous labor (Frankel and Webb 2008: 149). It is equally possible, however, that games could have played a role in the mortuary feasting and rituals that accompanied PreBA burials, as suggested by other classes of material culture (Keswani 2004: 82). These occasions were the occasions *par excellence* for the construction and maintenance of prestige and identity during the PreBA, and such gatherings of people afforded the opportunity for play performance that would engage with semiotic contingency in a widely visible setting. Further archaeological exploration of the presence of games in cemetery contexts is necessary to further explore this potentially important social setting for games.

In addition to acknowledging the association between games and particular spaces, it is equally important to indicate certain kinds of spaces that did not produce games. Overall, games were typically found in households but also in open spaces that may have a communal aspect to them. Games have typically not been found in areas that seem to have specialized in production. This is true in Area C at Sotira *Kaminoudhia,* where spaces that show considerable evidence for production activities produced no games. Furthermore, sites such as Ambelikou *Aletri* (Frankel and Webb 2013) and Area A at Erimi *Laonin tou Porakou* (Bombardieri 2010a, 2010b, 2013) show abundant

evidence for production activities, but no games. Indeed, games were not known from Erimi *Laonin tou Porakou*—which is located in a region where games are abundant even as surface finds at PreBA sites—until excavation began in the domestic portion of the settlement (Luca Bombardieri, personal communication; Saggio 2016). This strongly indicates an aversion to the use of games in spaces that are primarily dedicated to production, perhaps indicating a separation between work spaces and play spaces.

Summary: Remains from Cypriot PreBA settlements demonstrate a variety of social contexts in which games were played, in some cases where people could effectively engage in performative demonstrations of control over semiotic contingency through games, and in others where they may have focused on grounding. While it may be difficult to determine places where games were played away from the view of many people, such as between two people alone in a household, it does seem that games were commonly played in spaces where drinking and eating also took place, and that, in some cases, games were placed where the players would be most visible, even when they were in households. The results of the CA do not support a connection between games and feasting in PreBA settlements, and their absence from a feasting space at Alambra *Mouttes* supports this conclusion. Fledgling evidence may suggest an association between mortuary feasting and gaming, but much research needs to be done before making a conclusion regarding this. Nevertheless, there is some connection between games and burials, as those found in PreBA tombs received differential treatment from those found elsewhere. Games are most associated with the Unit 12 ritual complex at Sotira *Kaminoudhia*, and this space is consistent with the expectations for high visibility of

gaming performance and engagement with contingency. In contrast, games appear to have been avoided in spaces devoted to production, which may indicate social attitudes towards play versus work.

Protohistoric Bronze Age: The CA for Protohistoric Bronze Age sites was performed in two iterations. The first identified two outliers (Fig VII.59), one each at Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou*, indicating a difference between these spaces and the rest of those included in the analysis. A second iteration of the CA was performed excluding these spaces, and this scatterplot separated contexts at Maa *Palaeokastro* from those at Episkopi *Phaneromeni* (Fig. VII.60). These results suggest differential gaming practices among the settlements at different tiers of the ProBA settlement hierarchy proposed by Knapp (1997; 2013: 354–5). The four tiers he proposes, which are based on function and size (in descending order), are:

1. Coastal centers
2. Inland towns
3. Smaller inland sites
4. Agricultural and pottery-producing villages, mining sites.

Sites from tiers one, two, and four were represented in the CA, while no site from tier three has produced a game to date. This may be due to the age of the excavations of those sites rather than a reflection of an avoidance of gaming there, as no tier three sites have

been excavated since Swiny's identification of gaming stones. While the results of the CA are more equivocal than those from the PreBA—due to fewer data—there are, nevertheless, conclusions that can be made.

Coastal Centers: The sites from tier one in Knapp's hierarchy that were included in the CA were Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou*. Both of these sites appeared as outliers in the first iteration of the CA, and were associated with copper production (copper lumps, slag, casting waste) in Room 3 of Building 1 at Maroni *Tsaroukkas,* as well as ceramic production (unbaked clay lumps) and specialized vessels in the case of the "Room with Benches" at Morphou *Toumba tou Skourou.* Both examples show considerable difference not only from the spaces with games at other ProBA sites, but also a different pattern from that found in PreBA sites. The excavated portion of the settlement at Morphou *Toumba tou Skourou* has been interpreted as a potters' quarter, and the Room with Benches is interpreted as part of a potters' workshop, with many different pots resting on benches in this space. The appearance of a *senet* game in a space with a focus on production such as this one is in direct contrast to the evidence from PreBA sites, where there seems to have been an aversion to the play of games in production contexts.

Interpretation of the game from Room 3 of Building 1 at Maroni *Tsaroukkas* is more complex. It is not completely certain if all of the finds tabulated are exactly contemporaneous, as floor surfaces were often patchy and difficult to trace, but overall the identification of small scale crafting activity in this space is consistent, even if the types of production changed through time (David Sewell, email dated 2/5/2013). Coupled

with the results of the CA, it is apparent that this space was production-oriented, and the game's presence here offers another divergence from the PreBA patterns of gaming contexts.

It is also important to note that the game from Room 3 was of the 10-Ring type, a game that is primarily known from Crete, rather than a Cypriot *senet* or *mehen* game. 10-Ring and the game of twenty squares both made their first appearances in the coastal centers of the island during the ProBA, but this particular 10-Ring game is currently the only excavated example to come from a primary archaeological context. The two other examples of this game were also from coastal centers, but one was built into a wall (at Hala Sultan Tekke) and the other remains unpublished (from Episkopi *Bamboula*). Thus, the 10-Ring game from Maroni *Tsaroukkas* provides an important glimpse into the social context of this game in ProBA Cypriot society. Since it appears in a production context, as *senet* does at Morphou *Toumba tou Skourou*, it appears that the game did not hold any kind of special status on the island and was played in the same social contexts as the indigenous Cypriot games, at least in the coastal centers. No evidence exists to suggest that 10-Ring was played in lower tiers of the settlement hierarchy, suggesting that despite its similar use in coastal centers, it was not fully adopted into the gaming practices on the island like *senet* and *mehen* had been at the beginning of the PreBA.

Games have been found at Kition *Kathari*, but their inclusion in the CA was impossible due to the situation of their discovery. The largest game found on the island, a *mehen*, was found outside the Temple IV complex at this site without published contextual information, and *senet* games were found nearby and built into two of the altars in the temple itself. It is difficult to determine whether these games are in

secondary context, merely built into the architecture of the structure, having been quarried from some earlier settlement, or if they were part of the cult practices at this temple. If they were part of the ritual practice in this structure, then it would represent a renewal of the association between the play of games and ritual practice attested at Sotira *Kaminoudhia.* The concentration of gaming finds around this temple is suggestive that they were used there, but the archaeological context remains inconclusive.

Senet and *mehen* have mostly been firmly attributed to secondary contexts at coastal centers, if they appear at all. They have been found on the surface and built into walls at Maroni *Tsaroukkas* and Kalavasos *Ayios Dhimitrios*, and are completely absent from Enkomi and Alassa *Palaeotaverna.* Games are also known from Maroni *Vournes* and Episkopi *Bamboula*, but remain incompletely published and, as a result, their find contexts are incompletely understood. There are a couple of possible scenarios to explain the relative absence of *senet* and *mehen* from these relatively large settlements. One possibility is that they simply were played there rarely, if at all. Another explanation may be that excavations have typically focused on public administrative buildings as well as elite and ritual structures, which may obscure more everyday practices of gaming that may have existed in other types of contexts. One might expect games to have been played in such spaces, as many of them have public components (Fisher 2007; 2009a; 2009b). Analogous public spaces at Knossos (Hillbom 2011: 90–5), Mari (Parrot 1958: 13, 46–7, 182, 247, 258), Saqqara (Piccione 1990a: 382–9) and the Forum Romanum (Trifilò 2011) all contained graffiti games, as the visibility of these kinds of spaces in public buildings provides a setting favorable to game performance—"public-inclusive interactions" (Fisher 2009a: 189; 2009b: 447), and, indeed, may have been the reason for their location

in such visible places. Feasting events have been suggested at some of these public buildings in Cyprus, such as in Building X at Kalavasos *Ayios Dhimitrios* (Fisher 2009a: 196–8, 201–2) and the Ashlar Building at Enkomi (Fisher 2009b: 453–4), which may indicate a continued aversion to playing *senet* and *mehen* in feasting contexts, as has been proposed for the PreBA.

It is important to note that the Ashlar Building did produce two (albeit fragmentary) boards for the game of twenty squares, a Levantine import highly connected to Eastern Mediterranean elite gift exchange (Crist *et al.* 2016a; Crist *et al.* 2016b: 101–2). Found at Enkomi, along with remains that likely represent this game at Morphou *Toumba tou Skourou* and Kalavasos *Ayios Dhimitrios*, boards for this game took on a completely different morphology than Cypriot *senet* and *mehen*, as discussed above. Being constructed from luxury materials, such as ivory and glass, with pieces made of faience, these objects were visually very different from the traditional limestone Cypriot games and conveyed meaning through the employment of International Style motifs (see above) on the boards themselves. Many of these types of boards were found in tombs. The two from the Ashlar Building were found in a pit, and were likely heirlooms (Ben-Tor 2009: 52–4). Nevertheless, their presence in this building, which was the site of feasting and other public-inclusive occasions, may indicate their use at such events to convey elite status through their materials and esoteric knowledge they represent. Interpretations regarding their use in the performance of play for the purpose of engaging with contingency are less clear, since they are in secondary context.

Towns: Two sites that fall into Knapp's second tier, Maa *Palaeokastro* and Pyla *Kokkinokremos*, produced games, but only two of these were from primary contexts, both from Maa *Palaeokastro*. They appear as outliers in the second iteration of the ProBA CA and are related to vessels related to drinking, as well as imported wares. This would appear to be the best evidence for a connection between feasting of some kind and gaming. Both of the *senet* games from the site were on thresholds, indicating an attempt to remain visible during play. The rooms in which they were located were deemed by the excavator to be high traffic areas (Karageorghis & Demas 1988: 48), and so the location of games in this area is a deliberate one to increase visibility of play, and thus indicating attempts by the players to make their performance of gaming visible to others.

The pairing of this practice with feasting in this structure is a curious one, as indications from PreBA and ProBA coastal centers do not suggest an association between play and feasting. Maa *Palaeokastro* itself is a confounding site, and Knapp admits that it does not completely fit with his proposed hierarchy (Knapp 2013: 357), though he lists it in the second tier. Interpretations of the site range from defensive (Karageorghis 1998: 127–30; Steel 2004: 188–90), storage facilities (Smith 1994: 274), to "bypass and outflanking centers" of mercantile elites (Sherratt 1998: 300–1). While the function of the site is difficult to interpret within the ProBA settlement hierarchy, Sherratt's interpretation that Maa *Palaeokastro* represents an elite (or group of elites) that broke off from the coastal center at Kouklia *Palaepaphos* in an attempt to build a new power base is tempting to interpret in the light of feasting activities and how they appear to differ from those seen at the coastal centers. Perhaps games are included in feasting at this site because of a greater need to build prestige, and, therefore, an added instrument of

contingency could help to achieve this goal. Furthermore, by providing a source of grounding, games could help to build or strengthen community identity in a setting without a longstanding history (keeping in mind that Maa *Palaeokastro* is both a late and short-lived ProBA 3 settlement). Building new social relationships through grounding would be necessary in such a settlement where people has come from elsewhere to live together. Games allow for the building of social cohesion and group identity, but also allow individuals to negotiate their own placement among the hierarchies, heterarchies, or social networks that existed. Games provide a liminoid space in which to do this, as well as the fluidity of contingency, which other artifact classes do not.

Agricultural villages: Of the types of sites categorized under tier four by Knapp, agricultural villages are the only ones that have produced games. While only a few settlements from this tier have been excavated, Episkopi *Phaneromeni*, Aredhiou *Vouppes*, and Kissonerga *Skalia,* all fall under this category, and all have produced games. It is difficult to interpret the extent to which *senet* and *mehen* were played at tier four sites, because those from Kissonerga *Skalia* and Aredhiou *Vouppes* (Allen 2008) are all in secondary context, either built into walls, in surface deposits, or reused as weights or other objects. Kissonerga *Skalia* is particularly difficult to interpret, as the games were all found in Areas B and G—the ProBA 1 portions of the settlement (Crewe and Hill 2012: 206)—, which are built on top of PreBA deposits. It is, thus, possible that the *senet* games found in Areas B and G could have been reused stones that were actually used for play in the PreBA settlement and were repurposed for other use during the ProBA. A similar argument could be made for Aredhiou *Vouppes*, but no obvious PreBA

settlements have been identified nearby. It must, therefore, be assumed that these objects were used for play during the ProBA at Aredhiou *Vouppes* and may have even held specialized meaning once they were removed from use as games (Steel 2013: 191). Nevertheless, there is little that can be said about the social context of games at these sites with current data.

Episkopi *Phaneromeni* provides the best evidence for the social context of ProBA gaming, as more games were found here than all the other ProBA sites combined. It remains problematic, however, because it is incompletely published. Since the data for this site were clustered closely together in the first two iterations of the CA with tier one and tier two sites as outliers, CA was performed on just the contexts from Episkopi *Phaneromeni* in order to determine differences between the contexts within this site. Two clusters were identified, with Cluster A consisting of partially roofed spaces, including Units 13 and 19, interpreted as gaming spaces due to the presence of multiple portable games and associated with household production, and Cluster B with interior spaces and single games. This pattern seems to suggest that people played games in partially roofed areas of households. Such evidence presents a similar conundrum to Unit 10 at Sotira *Kaminoudhia*, which produced multiple games but is most associated with household production, and therefore difficult to interpret as a place where people actually gathered to play. Units 13 and 19 at Episkopi *Phaneromeni* were, however, partially roofed or open-aired, and so are located in a place that would indicate an attempt to be visible during play, at least to adjoining rooms.

These results represent one of two phenomena: either that the social context of gaming in Episkopi *Phaneromeni* was similar to Maroni *Tsaroukkas* and Morphou

Toumba tou Skourou, i.e., that games were played in spaces related to production, or that the lacunae that exist in the data are presenting false patterns. Without complete sherd data published from the ProBA sites, and particularly with limited ceramic evidence from Episkopi *Phaneromeni*, it is likely that evidence for consumption activity is simply not present in the data in large enough quantities to produce a result suggesting consumption activity in any given space. This would explain why the spaces from Maa *Palaeokastro* appear as outliers when plotted with Episkopi *Phaneromeni*, as considerable ceramic evidence exists for those spaces. It is possible, though, that even with more ceramic data, the patterns could remain the same as they were for the tier one and two settlements.

Summary: Games appear to have been played in different kinds of social contexts at sites within different tiers of the ProBA settlement hierarchy. In coastal centers, *senet* and 10-ring were played in spaces where production was the primary activity, though it is also possible that *senet* and *mehen* were played in ritual contexts, at least at Kition *Kathari*. Elites, who were concentrated in the coastal centers, seem to have favored the Levantine game of twenty squares, which was a symbol of their wealth and control over esoteric knowledge. This game may have been incorporated into feasting or other public-inclusive events in monumental structures at these sites. At Maa *Palaeokastro*, *senet* appears alongside evidence for feasting on thresholds in areas with heavy foot traffic, showing a deliberate decision to play the games in a highly visible place. At Episkopi *Phaneromeni*, gaming spaces still appear in visible areas, but are associated with household production.

3. Contingency, Games, and Social Complexity

Examining the relationship between these results and their wider social processes requires a diachronic viewpoint, in order to make conclusions on how the playing of games may have been used to affect increasing social complexity, as well as how they may have been employed to mitigate against emerging realities of socio-economic inequality, or to examine how changing realities were reacted to in the ludic sphere.

Regarding the trajectory of social complexity in Bronze Age Cyprus, older assumptions about incipient complexity during the PreBA gradually increasing through the ProBA, with a dramatic increase in socio-economic disparity with the beginning of the ProBA, and reaching a peak during the ProBA 2 (see Chapter V) are beginning to be challenged. Recent research suggests non-linear changes in complexity occur on the regional, rather than island-wide, level in PreBA Cyprus. Specifically, sites in the central plain appear to maintain low to intermediate levels of social inequality through the PreBA, while south coast communities show "more complex social configurations" during the PreBA 1, but a decrease in complexity leading to the PreBA 2 (Swantek 2015).

Looking broadly at the practice of gaming in Bronze Age Cyprus in relation to social complexity, it appears that during periods of greater social complexity, games were played in a greater variety of social situations. The evidence for the ProBA shows games played in production areas, near feasting and public-inclusive occasions, as well as domestic spaces, and Sotira *Kaminoudhia* also shows evidence for the play of games in multiple types of social settings (domestic, consumption, ritual). While Swantek's initial analysis focused on cemetery data for conclusions on complexity with regard to the

control of labor, future analysis utilizing data from the ProBA 2 settlement may add new facets to this crucial discussion. Meanwhile, evidence from PreBA 2 central plain sites (Marki *Alonia,* Alambra *Mouttes*), with low levels of complexity, shows little variation in the types of spaces games were played, as they all seem to have been played in domestic contexts, along with some kind of consumption activity. Without the kind of public space seen at Sotira *Kaminoudhia*, the existence of which could be tied to complexity, residents of central plains sites do not seem to have engaged with contingency in the same way as people did at Sotira *Kaminoudhia*.

Discussion of PreBA complexity often downplays these sites in favor of discussion of more obvious manifestations of competition and wealth from the cemeteries of the north coast (Keswani 2004; 2005; Webb and Frankel 2010; 2013), but the social network approach taken by Swantek suggests that inequality did exist on the south coast during the ProBA 1, and though it decreased into the PreBA 2, it is entirely possible that this different social reality at Sotira *Kaminoudhia,* in part, explains the reason for people taking advantage of public spaces to engage in gaming performance. In the Unit 12 Complex, where ritual was the primary focus, games were played adjacent to the cult activity taking place within, and perhaps the games themselves played a part in the rituals themselves. Certainly, their inclusion on the shelf in Unit 12c, and the evidence for intentional breaking suggests that they were included as an important part of these practices.

Ritual practice, in itself, may play an important role in the development of social inequality, and indeed this is, at least in part, related to the role cult plays in mitigating and giving the appearance of control over contingency. Indeed, one of the major features

of religion as discussed by theorists is the way in which it attempts to deal with the unpredictable. It "identifies non-human actors as elements of existence and provides mechanisms whereby they can be addressed; creates sets of procedures or processes—such as ritual—that can be used to influence the course of events (Aldenderfer 2010: 81). This highlights the role that contingency plays as a basic constitutive part of ritual. Ritual is, itself, a performance that attempts to harness the unknowable, and purports to be able to either influence or predict outcomes. While games historians and theorists have long recognized the functional resemblance between games and ritual, comparisons have typically been couched in terms of their liminality, i.e., that they are set apart from everyday reality and social norms (Huizinga 1950: 17–27). Through the lens of contingency, however, the similarity between games and ritual becomes even more marked because they essentially are attempts to demonstrate one's mastery over the unknowable.

The importance of gaming, when it is imbued with higher meaning by its inclusion in ritual, then increases, and the performance of play and the outcomes of semiotic contingency that accompany any given game bear more weight, since they gain higher meaning in a ritual context. Successful performances of control over semiotic contingency may then lead to socially meaningful forms of prestige. Indeed, the ability to appear to be in control of unknowable outcomes results in a type of (perceived) ritual knowledge. While ritual knowledge in itself may not be the sole cause of socio-economic inequality and social complexity, it was one of the earliest forms of inequality to exist (Hayden 1995: 20–3) and, when combined with the capacity for the accumulation of

surplus, can provide the fuel for legitimation of social and economic debts to emergent elites (Aldenderfer 2010).

The other contexts in which games were played at Sotira *Kaminoudhia* show a preference toward playing in open spaces, including a potentially small-scale eating and drinking space at Unit 2 as well as in unroofed spaces within households (e.g., Unit 4). This shows attempts to be visible by the players, as they play in spaces that can be seen by others. Such attempts are difficult to spot at Marki *Alonia* and Alambra *Mouttes,* as the gaming spaces there were in roofed, presumably private, spaces. Though they are still associated with eating and drinking activities, they show less of an attempt to be seen, and thus gaming performance and attempts to demonstrate control over contingency seem to have been less of an important part of gaming practice in these sites. This may suggest a system whereby being visible for play has less benefit for the players or, alternatively, a stronger focus on grounding occasions between the players.

Nevertheless, games at Marki *Alonia* may have provided one expression of identity, even if it was a private expression within family groups or individuals from different households. The continued play of *mehen* in Compound 7 may indicate its position as one of the older households at the site through the play of this game that was present on the island hundreds of years before *senet.* Thus, while *senet* enjoyed a newfound popularity throughout the town after its introduction in the PreBA 2, *mehen* was maintained as part of the identity of the group living here, which appears to have been one of the households that held some of the prestige (Frankel and Webb 2006b: 300) in the low-level of inequality seen at central plain PreBA sites. Indeed, five of the eight archaeological contexts that produced games from occupational deposits were from

either Compound 6 or Compound 7, the longest-lived households at Marki *Alonia*. While the presence of games in other households argues against the kind of ownership seen in some African societies, where board ownership is restricted to "individuals of high rank and wealth" (Walker 2007: 251), there may still be some connection between the persistence of games at these two particular households and their continued social importance. One might imagine the use of games as more of a grounding tool in these scenarios, where games may have been played with other members of the community in order to build social relationships, since evidence for public, visible gaming performances is absent from the evidence.

When social complexity increased during the ProBA, the contexts in which games were played multiplied, reflecting different strategies in which games were used by people to interact with one another across the new social boundaries that had developed. Indeed, a continuation of household gaming can be seen at Episkopi *Phaneromeni,* though there may have been a preference for more visible play, similar to that seen from Unit 4 at Sotira *Kaminoudhia.* Indeed, players opted for visible locations at Maa *Palaeokastro, Maroni Tsaroukkas,* and, likely, in the Ashlar Building at Enkomi. Despite being similarly visible, the social circumstances of these visible acts of play are different and represent differential attempts at engaging with contingency through the performance of play.

At coastal centers such as Enkomi, and particularly in large public buildings made of ashlar masonry, public-inclusive events, which often included feasting, were employed by the elites of those sites to display their wealth and esoteric foreign knowledge in order to augment their status (Crewe 2007b: 228; Knapp 2013: 404; Steel 2010: 108–9). Even

the game itself, the Levantine game of twenty squares, was a type of foreign knowledge not apparently known to the wider Cypriot populace, and playing it was, thus, an expression and demonstration of elite identity. *Senet* and *mehen* may have been a part of public-inclusive rituals at Temple IV at Kition *Kathari,* but these contexts would have been tied more closely to religious ritual than the kind of events that occurred in the Ashlar Building at Enkomi. This temple building is different from the types of buildings seen as pseudo-religious monumental administrative structures at sites like Enkomi, Alassa *Palaeotaverna*, and Kalavasos *Ayios Dhimitrios,* and the relationship between religious practices at Kition and elite practice has received less attention. Nevertheless, the inclusion of the more traditional Cypriot games, rather than the use of the elite-focused game of twenty squares, points to a different purpose for the ritual practice that occurred at Temple IV. While a definitive statement cannot be made, especially because of the difficulty in discussing associated finds in the specific spaces near the temple where the large *mehen* game was found, it indicates that either the participants in the activities occurring here were not familiar with twenty squares, or that some part of indigenous Cypriot identity was considered an important part of the ritual and, thus, included in the form of *senet* and *mehen.* The appearance of these games around this particular building is striking, considering their relative absence from buildings (particularly elite and public buildings) at coastal centers.

While this aversion toward the traditional games of the island is apparent in elite contexts, there may be evidence for play by non-elites in coastal centers. Indeed, even assuming a socio-economic difference between the inhabitants of tier four and tier one sites (Knapp 2013: 356), gaming spaces at Episkopi *Phaneromeni* and the games found at

Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou* are in similar contexts, i.e., associated with production activities, and in somewhat visible areas. While the production context at Episkopi *Phaneromeni* is at the household level—in agreement with the general interpretations of the site which do not suggest major specialized production there (Carpenter 1981; Swiny 1986a)—, those at Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou* were in specialized copper and ceramic production spaces, respectively. This shows similar attitudes toward the relationship between play and work between tier four and tier one sites, but which differ from that seen in the PreBA. Considering that *senet* is the game most closely associated with these production activities (particularly at Episkopi *Phaneromeni* and Morphou *Toumba tou Skourou*), there may be an indication of socio-economic status related to play in these contexts. The excavated portion of Morphou *Toumba tou Skourou* was interpreted as a potters' quarter (Vermeule and Wolsky 1990), and thus not apparently an elite sector of the town, not dissimilar from the non-elite population of Episkopi *Phaneromeni.*

This may further be an indication of differences in gaming practice according to socio-economic status, where non-elite people not only play different games, but also play them in different settings than elites. This could be an act of resistance against elite ideology, as playing the more traditional *senet* game could have been a marker of a more indigenous Cypriot identity than that taken by the elites, which was more cosmopolitan in nature. By playing this game in visible spaces, people signaled their identity in ways that would be readily understandable to observers, while at the same time attempting to demonstrate their mastery of contingency within the non-elite community. Indeed, social distance may be apparent among groups in centers in the multiple mounds that form

Morphou *Toumba tou Skourou* (Vermeule & Wolsky 1990: 14–5). It is also possible that the game of twenty squares, as a type of esoteric foreign knowledge, was controlled by the elites and non-elites did not have access to it. It is important to note here that Episkopi *Phaneromeni* and Morphou *Toumba tou Skourou* are both ProBA 1 sites, inhabited before the pinnacle of complexity seen during the ProBA 2. The phenomenon seen here could be a chronological one. During the ProBA 1, extensive foreign contacts had yet to lead to the fully realized socio-economic disparity and specific elite practices that are obvious during the ProBA 2. Thus, the practices associated with twenty squares from Enkomi may not have developed yet on the island. Nevertheless, the game of twenty squares does appear from a tomb at Morphou *Toumba tou Skourou* dating to this period, so its mortuary connections, which are seen later in the ProBA at Enkomi, Kalavasos *Ayios Dhimitrios* and Hala Sultan Tekke, are already apparent at this earlier date.

Indeed, the play of 10-Ring at ProBA 3 Maroni *Tsaroukkas* reflects a similar social reality. While this is an adoption of an Aegean game, it did not share the same status as the game of twenty squares, which was made of elite materials and used in public-inclusive events in monumental buildings. Rather, it is made similarly to *senet* and *mehen* out of depressions pecked into a block of limestone. Aside from recalling the traditional games materially, its context, which was most associated with copper production, is analogous to that seen at Morphou *Toumba tou Skourou* and Episkopi *Phaneromeni*. As the only primary context game available from a ProBA 3 coastal center, this may show a continued aversion to the play of traditional games near elite presence in such structures. The play of 10-Ring would mitigate these circumstances: as an Aegean game it may not have held the same connotations as *senet* and *mehen*—

indeed, the game of twenty squares was found etched onto the same stone as a 10-Ring game at Hala Sultan Tekke—, so its play might have been intended to signal a certain cosmopolitan gaming practice in such proximity to elites. The presence of this game, in a context that is similar to that seen of non-elite players, may signal that either the same strategies were used by players of 10-Ring in coastal centers, but trying to achieve different goals through the use of an imported game rather than an indigenous one. A possible interpretation is that this represents an attempt to be seen playing an Aegean game in an open space such as this. The production context and method of manufacture suggest that it was played by a non-elite person (or people), who may have used this game to attempt to increase their prestige through the visible utilization of this type of foreign knowledge that was more accessible to them. Whether this was true of all players of 10-Ring on Cyprus is unknown, since the example from Episkopi *Bamboula* is incompletely published and, while the one from Hala Sultan Tekke appears alongside the game of twenty squares, suggesting a connection with the elite nature of this game, it was found in secondary context, built into a wall.

At Maa *Palaeokastro* games were found in contexts that were expected to be common places for play: in visible spaces with associated feasting. That this is the exception for Bronze Age gaming contexts on Cyprus is surprising, and further adds to the difficulty in interpreting this site. One of the more popular interpretations is that this site is a defensive outpost (Karageorghis 1998: 127–30; Steel 2004: 188–90), and board games are notably common in fortresses throughout the ancient world (Austin 1934: 26; Brun 2003; 2011; Matelly 2003; Mulvin and Sidebotham 2003). Alternatively, Sherratt's (1998: 300–1) suggestion that the site is the result of a group of people who broke off

from the coastal center at Kouklia *Palaepaphos* and attempting to claim their own unique elite status may also explain the presence of games in a different context than that seen at other ProBA sites. The feasting that the gaming accompanied was not in the quasi-monumental Building 1 at the site, but at one of the outlying buildings near the larger structures. This may suggest that, while an aversion toward the play of *senet* and *mehen* may have endured at certain elite contexts, other opportunities were taken for the addition of contrived contingency in feasting practices, which could bolster the prestige building aspect of these feasts. Similarly, in such a newly founded settlement, the new inhabitants may have come from different settlements/kinship groups, and the game, which was recognized island-wide, may have been a grounding mechanism to build relationships among unacquainted individuals, increasing individuals' social networks, upon which economic and power relationships could then be built.

Overall, there seems to be a relationship between increased social complexity and the variation in contexts in which games were played. This is counter to the suggestion made by Kent (1991: 465), in which it was predicted that increased socio-economic hierarchy would lead to segmentation (more clearly defined spaces in which certain activities are performed) in play. Instead, the proliferation of social boundaries and interconnectivity of settlements that were the result of developing socio-economic and settlement hierarchies appear to have brought about a need for people to introduce mutually recognizable grounding mechanisms into new arenas of social life. In so doing, more opportunities were presented to interact with one another, whether during feasts at Maa *Palaeokastro*, during production activities at Maroni *Tsaroukkas* and Morphou *Toumba tou Skourou*, during religious ritual at Kition *Kathari*, or in households at

Episkopi *Phaneromeni*. In addition, a preference is shown for play in visible open aired spaces, which provide not only the opportunity for more social interaction, but also the social setting to be able to engage with contingency in order to build one's own status in this way. Indeed, new gaming practices arose on the island that attempted to build a strong elite status through the use of foreign games, though these games may, in some cases, have been played by people who were not at the top level of socio-economic status. This could be a result of competition between kin groups, as has been suggested for ProBA coastal centers (Manning 1998a), and the play of games in feasting, ritual, and public-inclusive events may have facilitated such competition through the engagement with contingency between members of different groups at such events.

It is difficult to see the development of social complexity arising from the gaming practices of PreBA Cyprus, as evidence from PreBA 2 sites in the central plain indicates play as a household activity, and apparently absent from the feasting activities that would be associated with the accumulation of prestige necessary for the development of socio-economic disparities. Regional disparities in the level of complexity may, however, be seen in the play of games in spaces associated with ritual, smaller-scale consumption, and in households. Games appear to be more generally played in the household, but it should be noted that few non-domestic spaces exist at PreBA sites. The presence of ritually-killed and votive games may suggest a connection between games and mortuary ritual, and surface finds at cemeteries suggest that games may have been played as part of the prestige building mortuary feasts that led to the development of complexity in parts of the PreBA. Future work in finding evidence for games in these types of feasts needs to be done in order to determine whether this was a way that incipient elites harnessed

contingency in order to build their prestige and to bring a degree of higher-level meaning to augment their economic prowess.

Chapter IX: Conclusions, Problems and Future Work

With a corpus of games larger than any other in antiquity, Bronze Age Cyprus has provided a unique opportunity to study play archaeologically and to examine its relationship to wider social processes through time. The results of this work bring to light some of the ways in which Bronze Age Cypriots used games in their everyday life to interact with one another, as well as to engage with their own identities in a changing social landscape. Board games, when studied in the light of anthropological theory and modern archaeological methods, can provide insight into the strategies individuals employ to navigate their social realities, bringing a previously inaccessible aspect of ancient life to light. The study of ancient games in this light remains difficult in other regions without as large of a corpus of material with which to address the study of play, but this research will inform examinations of play in other regions where evidence is more elusive.

Ultimately, when considering the overreaching research question of this research—whether games can produce social change through time, and whether people play them differently in reaction to social changes—, mixed results were found. There does not seem to be evidence that the play of games affected social complexity in a meaningful way, as there is little evidence for games during feasting events during the PreBA. One would expect to see games used in public settings such as feasting, where people would be engaging with semiotic contingency through the performance of play to gain prestige, as evidence for this, and it does not exist. There is, nevertheless, evidence that social change produces change in gaming practices, as this research showed that grounding processes were emphasized during the PreBA, while performance of games

was an important part of the act of playing at sites higher in the settlement hierarchy during the ProBA.

1. Problems

With the identification of gaming stones at Episkopi *Phameromeni* by Stuart Swiny, the discovery of this artifact type accelerated at Bronze Age sites (settlements in particular), but their discovery did not lead to an increased level of scrutiny, as they have received relatively little synthesis in the literature. Because this artifact class was only recently identified and anthropologically interesting ways of interpreting play are scarce–and, indeed, new to archaeology–, analysis of these objects has not been standardized, and much relevant information has been left out of excavation reports. Thus, a major part of the present study involved the reexamination of material that had already been examined and published.

Historically, Cypriot gaming stones have been grouped with ground stone artifacts in publications because of their material (limestone or, more rarely, diabase). While analysis of gaming stones by ground stone experts provides insights into the manufacture of these artifacts, information regarding interpretation of the games displayed on the stone has often been lacking. Typically, ground stone tools are objects used for various production activities, and so the types of questions that are usually the focus of ground stone analysis are not particularly relevant to the gaming stones. While it may not be necessary to have a separate game specialist examining these artifacts for every excavation on the island, comprehensive study of this artifact class, such as the one undertaken here, should help to emphasize properties of gaming stones that must be

included in any analysis of these objects, especially when they are presented in excavation reports. These properties include, but are not limited to:

-dimensions (length, width, depth)

-pattern of depressions appearing on the stone

-number of depressions

-number of differentiated depressions

-percentage of pattern remaining

-weight

-material

-signs of wear

-description of the quality of the pattern

-breakage pattern

-other distinguishing features (dividing lines, etc.)

These properties will help inform future research by providing scholars with the types of data that are necessary for the discussion of games as they relate to social processes, as elaborated in the present study.

This research involved the reanalysis of gaming stones in order to compile this data when it was not already present, but other contextual data was left out of the CA because it was inconsistently presented in excavation reports. The excavation, analysis, and publication strategies of the various specialists working on Bronze Age sites are sometimes not uniform across excavation projects, leading to problems and potential misinterpretations when performing CA. For example, zooarchaeological remains were most comprehensively compiled in the publication from Marki *Alonia,* which included

the excavation's finds database. Using the finds database, it was possible to compile counts of specific bones, as well as the species to which they belonged, found in each architectural unit. Such finely detailed data were not available from Sotira *Kaminoudhia* and Alambra *Mouttes,* and so zooarchaeological data were not considered in the CA, leaving out the possibility of interpreting the relationship between gaming and proposed meat processing spaces (such as Unit 21 at Sotira *Kaminoudhia*), or elaborating on the relationship between play and food consumption. Likewise, lithic evidence was not included in the CA because it was inconsistently published across the sites' excavation reports. Locating these objects in museums and identifying them was outside the scope of this research project, but if they had been published in a standardized and comprehensive way quantitative methods could be more readily utilized for analysis of Cypriot archaeological materials.

A similar problem exists for sherd data from ProBA sites, which were resultantly impossible to include with PreBA sites in a single CA. This mostly reflects a chronological distinction, since the PreBA sites discussed here (with the exception of Maroni *Tsaroukkas)* have been more recently–and, thus, more scientifically–excavated. Sherd data was only partially available or not available at all, from older published excavations such as Maa *Palaeokasstro* and Morphou *Toumba tou Skourou,* while others, including Episkopi *Phaneromeni* and Maroni *Tsaroukkas,* remain unpublished. The absence of sherd data may occlude evidence for feasting or other consumption activity in spaces for which ceramic material may have been the only material correlate of these practices. Incompletely published material also prevented the inclusion of Politiko *Troullia,* Episkopi *Bamboula*, and Maroni *Vournes* in the CA, so their publication is

eagerly awaited, as data from those sites may add further dimensions and interpretations to the inferences made from the current possible iteration of the CA. Episkopi *Bamboula* and Maroni *Vournes* are sites that could be particularly informative, as they are both tier one coastal centers that could provide further insight into the performance of play in those types of settlements.

Standardization in the ways artifact classes are published is, thus, crucial if comprehensive statistical data is to be harnessed for broader interpretations of societal processes on the island. While it is true that certain research questions cannot always be anticipated by primary analysis in the field, it is important for data to be presented in a way that not only addresses the excavators' and specialists' proximal research questions, but also including basic identifying data in the publication in order to facilitate future research on important bodies of evidence that may otherwise remain hidden or inaccessible to scholars pursuing research that could harness this data, but who lack the necessary skills and training to identify, for instance, zooarchaeological remains.

As has been mentioned before, the possibility that Cypriots also played games on wooden boards exists, and thus would hide other contexts in which those games were played. The conclusions of this research are, thus, strongest for considering the contexts in which stone game boards were utilized for play. For the ProBA, during which there are game pieces and inlays from game boards from which the wooden portions have decayed, wooden boards are more likely to have been used for play, most likely for the game of twenty squares, and thus our understanding of the contexts in which this game was played on Cyprus is likely incomplete. Nevertheless, the data on stone gaming boards from Cyprus is more robust than it is from other regions, including those in which

wooden boards have been preserved, and so the conclusions made here are the strongest that are currently available to researchers in the region or, indeed, anywhere in antiquity.

Of course, the continued political situation on Cyprus prevents archaeological work in the northern sector of the island, a region which is crucial to the understanding of how these games likely arrived on there, since the major PreBA coastal sites with foreign contact were along the north coast. While the one game found on the surface at Cemetery B at Bellapais *Vounous* indicates that games were known in the area, the inability to excavate since 1974 (six years before Swiny's 1980 article identifying these artifacts as games) has prevented the discovery of games at perhaps the most important sites that would connect Cypriot games to their mainland counterparts. Furthermore, the northern PreBA sites are the ones that have produced the most evidence for social complexity for that period, and so any conclusions about the connection between play and changing socio-economic realities are incomplete without data from those sites. Likewise, the absence of *senet* and *mehen* games from Enkomi is conspicuous, and could be explained by its excavation before Swiny's discovery of the games at Episkopi *Phaneromeni*, though he did excavate at Enkomi before 1974 (personal communication) and its subsequent inaccessibility. Without archaeological data from every region of the island, conclusions about the relationship between play and wider social processes must remain regionally focused, always with this caveat in mind.

2. Play Strategies: Grounding versus Mastery of Contingency

Nevertheless, there is much that can be said about the ways Cypriots harnessed games to drive and react to social change. Most broadly, it seems that, when socio-economic

complexity was at a low level, Cypriots did not play games in public as much, perhaps because they were less concerned with the effects of the performance of play. Instead, they were played most commonly within household structures, often in smaller roofed spaces, with some evidence for consumption activity, but not on the scale of feasting. Interaction through play on a smaller scale may indicate an emphasis on the grounding properties of games, allowing for people to initiate or strengthen bonds among family groups or within communities. Such grounding occasions are known from the ethnographic literature, most frequently in relation to marriages and coming of age rituals (e.g., Finkel 2006: 72). The movement of people between communities on the island has been discussed in the light of marriage between members of different settlements (Frankel and Webb 1996: 183), and so, with *senet* and *mehen* serving as a shared cultural practice, it is possible that this is one way individuals could get to know one another without other shared experiences to draw upon.

While, during the ProBA on Cyprus, sites display differences in associated activities between tiers in the settlement hierarchy (household in tier four, feasting in tier two, production in tier one), the play of *senet* seems to have been played in visible spaces despite the kinds of activities it accompanied. This may show a kind of status consciousness at all socio-economic levels, whereby individuals were making attempts to engage in the performance of play in contexts available to them. Grounding, of course, still plays a part in the play of games even when performance is emphasized, as the individuals engaging in play are still sharing an experience. With more complexity, however, people seem to have been placing an emphasis on the social rewards afforded by the performative aspects of play, by playing more frequently in visible places, even

within households. Increased visibility suggests an elevated emphasis on the performance of the game, in order to convey mastery over the various types of contingency it conjures, and, thus, to gain some kind of agency over the semiotic contingency resulting from the presence of spectators. Gaming in public has been less frequently examined with respect to board games (Trifilò 2011 is a notable exception), but sports, which are the form of play most often involving spectators, and success in them, is often connected to status of the participants (Hill and Clark 2001: 336). While the semiotic contingency in which they are engaged operates on a higher level in the example of sporting events, where many spectators are involved and resources are often expended on large occasions, this effect also exists to a lesser, but possibly more frequently recurring, degree for board games played in visible spaces. In this way, they may be more subversive in the ways they allow humans to engage with contingency and status. Instead of an overt display of resources, power, and obvious skill for many people, individuals can engage with this contrived form of contingency to subvert existing social boundaries, and attempt to gain prestige in a less blatant manner. Whether anyone would ever be able to achieve the same level of status afforded by large sporting events is unlikely, but it would, nevertheless, have affected the everyday relationships of the participants with other members of their communities.

Games imported during the ProBA show similar uses for performance, as the Aegean game 12-Ring appears to have been played in similar contexts to *senet* in coastal centers. More strikingly, though, is the appearance of the game of twenty squares, of Levantine origin and with its internationally recognized connotations with authority and elite status, associations which appear to have been adopted by the higher status Cypriots

to demonstrate their knowledge of esoteric foreign knowledge to further augment their prestige. The association of these games with higher status may, then, have relegated *senet* and *mehen* as indicators of lower status, and this may explain their absence from feasting and other public-inclusive occasions that were seen in the monumental structures in the tier one settlements. Rather, the discovery of two games of twenty squares in the Ashlar Building at Enkomi may suggest that this game was used in such specialized events. Since these events took place in visible spaces within these structures, there was certainly an attempt to be seen playing this game, though it is difficult to know whether the performance through which the players engaged with contingency was based more on intimidation and illusory actions to demonstrate a mastery of the contingent processes of the game, or whether the play itself was a performance showing mastery over esoteric foreign knowledge materialized in the form of the game.

In any case, the game of twenty squares does not appear to have been a grounding device between elites and non-elites, as there appears to have been little penetration of the game into non-elite contexts, with only one Bronze Age example of this game having been found made of non-elite material. While it is unlikely that Cypriot elites completely avoided playing *senet* and *mehen*—indeed, their presence at Temple IV at Kition *Kathari* argues against a complete moratorium on these games—, it is impossible to determine this with the current state of the archaeological record. Later textual accounts, discussing Roman games, as well as archaeological evidence, point to ostensibly forbidden and "plebeian" games being played by elites and in public places such as in various fora (Purcell 1995: 25), so the relationship between games and status is often a complicated one.

Building from the suggestion that elites may have been familiar with *senet* and/or *mehen*, it is possible that the apparent aversion to playing them visibly at public-inclusive occasions is related to the contingency that they contrive. Playing a widely-known game at one of these gatherings would open the players up to the scrutiny of spectators, and the incumbent semiotic contingency of such a situation may have been purposefully avoided by elites, in order to maintain a level of control and mitigate the types of scenarios under which their status could be undermined. The inclusion of the game of twenty squares, however, allows for those with higher status to engage with contingency, but also to control it, as they restrict access to this esoteric knowledge. It may similarly be possible that the hosts of feasting occasions at PreBA sites had similarly not included games in these events, as the people provisioning the feast may have wanted to maintain a level of control over the engagement with contingency that was possible at such occasions.

The pattern of finds at Sotira *Kaminoudhia* seems to indicate a more accepting attitude toward public and visible gaming than elsewhere in the PreBA. It is possible that this is due to regional differences, but could also be tied to the higher level of socio-economic complexity seen on the south coast (when compared to central plain sites) seen there during the PreBA 1. If public gaming is more closely related to attempts at building prestige in periods with more complexity, then one might imagine this practice as a holdover from the earlier PreBA 1 period with higher levels of complexity than the PreBA 2. This may represent an entanglement between games and place, whereby people continued to play games in visible spaces, even when complexity decreased. Of course, difficulty in this inference lies in the absence of PreBA 1 levels in the settlement (though tombs from this period do exist at the nearby cemetery), so little can be said about the

contexts in which games were played during the PreBA 1 at Sotira *Kaminoudhia*. It is possible, though, that other metrics which were not used in the network analysis of PreBA Cyprus may, when included in the data, would indicate a different social reality in this site which is very unique for the island during this time period, not least because of the plethora of games that were found there.

Overall, there do seem to be connections between the play of games and social change, if not social complexity. There are marked differences in the social context of gaming between PreBA and ProBA sites, with an emphasis on visible gaming during or after periods of social complexity. Despite this, the game of twenty squares, when it was introduced with its own specialized meaning, became a symbol of elite status and was employed as such in publically visible ways, to the exclusion of indigenous *senet* and *mehen.* Even so, the similarly imported Aegean game 10-Ring appears to have been played in similar contexts as *senet,* though there may be a weaker connection with the game of twenty squares as well. This indicates that foreign games were not always adopted and controlled as esoteric knowledge by elites, and this may point to both the value placed on the games cross-culturally, as well as the types of interactions that brought these two games to the island.

Whether engaging in performances during play that attempt to guide spectators' perceptions to conclusions about a player's ability to control contingent outcomes, or whether individuals played as a grounding mechanism to initiate relationships between two people or to maintain existing ties, games were tools through which people attempted to manipulate their social realities. When these realities changed, the strategies employed by people through games in order to counteract and exploit these changes adapted by

placing more emphasis on grounding qualities, or on the contingency and performance of games.

3. Future Work

The intention of this research is to serve as a new paradigm in the way board games are approached in archeological literature, and bring research into this artifact class out of the culture historical mode of inquiry. While the absence of data has, in part, fueled the stagnation in treatments of this arena of ancient life, the Cypriot corpus provides even more data than was considered for this project. Furthermore, continued work on the island, along with application of better methods to recognize and identify games and their paraphernalia in the archaeological record in other regions will help to bring the level of theoretical application to the study of ancient gaming on a par with that which is considered rigorous for modern anthropological archaeology.

Burgeoning data suggests that games were played in Cyprus after the end of the Bronze Age. Swiny recognized games found at Iron Age sites, including the cemetery at Kouklia *Skales* (Karageorghis 1983) and Politiko *Tamassos* (Buccholz 1981, 1982). Other patterns, which do not fit the canonical *senet* or *mehen* patterns, were found at the Late Roman basilica at Kourion (Swiny 1986a: Fig 56.d), suggesting that games were played through many periods on the island, and later games in particular may have taken different forms. The example from Kourion seems to be a popular Greek game, *pente grammai*, which took the form of two rows of five depressions in Asia Minor and eastern parts of the Roman Empire (Schädler 2008, 2013: 65), but which require more attention. As an example of Roman graffiti games, which are well-known throughout the Empire

(Bell 2007; Bell and Roueché 2007; Crist *et al.* 2016b: 125–49; Roueché 2007), this may indicate the presence of other graffiti games that have gone unnoticed at the island's major sites of Late Antiquity. Survey of these architectural remains may identify such ephemeral patterns in paving stones, and spatial analysis, such as that begun by Trifilò (2011) at the Forum Romanum and Timgad, de Voogt (2010) at Palmyra, and Roueché (2007) at Aphrodisias, could then provide comparisons of Roman gaming practices between Cyprus and other regions of the Empire. Evidence also exists for more canonical Roman versions of the game *duodecim scripta*, as it occurs in a mosaic from the House of Eustolius at Kourion (Swiny 1986a: Fig. 56.g). Better identification, description, and analysis of these games may lead to further discoveries of this artifact type at Roman sites, much like Swiny's work did for *senet* and *mehen* at Bronze Age sites.

Games in Iron Age Cyprus are also poorly understood, and may reflect a combination of Greek and indigenous Cypriot gaming practices. In many cases, the games found take the same form as those known from Bronze Age sites: depressions arrayed in rows. Indeed, at some sites these artifacts take the same form as *senet*, as in the examples found built into Iron Age walls at Tamassos (personal observation), and in the *dromoi* of tombs at Kouklia *Skales* (Karageorghis 1983: 107, 122, 182, 200, 212, 228, 276), and on the surface near Marion (Swiny 1986a: 40). Despite this, it is currently impossible to say whether *senet* survived into the Cypro-Geometric period and beyond, because these artifacts were all found in secondary context, and could have been used as building material or fill quarried from nearby Bronze Age sites. Artifacts which appear to be games were found in the sanctuary of Aphrodite on the acropolis at Amathus (Fourrier 2003), but these artifacts do not appear to have taken the canonical *senet* pattern, and so

may be another type of game, or some other type of artifact altogether. The Greek game of *pente grammai*, or five lines, has been found in its doubled form at Dhekelia (Michaelidou-Nicolaou 1965: 122–7) and also on a column capital at Tamassos (Michaelidou-Nicolau 1970). This pattern, which consists of eleven incised parallel lines with a centered "X" on the third, fifth, and ninth lines, is one that may not be readily identified as a game by excavators, considering the rarity of *pente grammai* boards in the Greek world. Scrutiny of excavated materials in an attempt to identify fragmentary or even, potentially, whole but misidentified boards of this type will help to illuminate the penetration of this foreign game into Cypriot Iron Age society. Other gaming material has been found at the Hellenistic site on the island of Yeronisos, just off the west coast of Cyprus (Connelly 2013), which could either be late versions of Egyptian *senet* or the Greek game *polis*.

If more data on gaming can be found at Iron Age sites from primary contexts, then similar approaches can be taken to that pursued here for Bronze Age Cyprus. Comparisons between the results may then help to further elucidate gaming with respect to social change, as the types of interactions existing within and between the communities on the island changed yet again, with the formation of territorial kingdoms dividing the landscape (Iacovou 2008; Stylianou 1989). It is also possible that, with more data, a better understanding of the games Cypriots played could inform persistent discussions regarding interactions between ethnic groups (Greek, Phoenician, Cypriot) that were active on the island (Karageorghis 2002; Rupp 1987).

Aside from game boards, better analysis of other types of gaming paraphernalia needs to be developed to broaden inquiries into gaming and social processes. Playing

pieces, though relatively common at sites throughout the Eastern Mediterranean, Egypt, and the Near East, have not been studied since the early twentieth century (Nash 1902; Towry-White 1902), and have been ignored to such a degree that typologies have not been developed to determine whether certain types are associated with certain games, if particular types were preferred in particular regions, or if there are chronological changes that can be seen in the types. Pioneering research on dice suggests that the patterning of numbers on their sides can be culturally specific (Eerkens *et al.* 2015), and provides an example of the types of data that should be collected from ancient dice to make conclusions about social constructions relating to their production and use.

Randomization devices, score-keeping devices for which appear to have been early forms of board games in the New World (Voorhies 2013), when found in earlier periods may provide information not only on the origins of board games, but also the other ways in which people engaged with contingency in attempts to control it and to predict the future. Astragali, which are commonly found at Mediterranean and Near Eastern sites, including many from Cypriot sites (Dikaios 1971: 241, 631; Halstead 1977: 271; Krumholz 1982: 278, 281, 299–300; Niklasson 1983: 175–6; Reese 1985: 385, 1990: 144–5, 2000), must be examined to identify modifications, which indicate their use as randomization devices rather than merely butchering refuse. Their archaeological context could also be analyzed using CA in a similar way to that used in this research for *senet* and *mehen* to analyze the social contexts in which they were used. CA could also be performed on contexts with these forms of play in the same table, to determine differences in the social contexts of astagali throwing and the play of specific board games.

With theoretically informed approaches to games, in addition to increased awareness of the forms they often take, it may then be possible to identify material and reexamine previously excavated evidence for gaming in archaeological cultures worldwide. Already, identification of games similar to those found in Cyprus has increased in the Bronze Age Levant (Sebbane 2001, 2004; Shai *et al.* 2014: 38), and publication of the large corpus from Arad may provide a stimulus to their discovery similar to that given by Swiny's work on Cyprus. Limestone blocks and graffiti that are analogous to the Cypriot games have been found in the Apsheron Peninsula in Azerbaijan (Aliyev and Abdullayev 2011), but they appear to display the Near Eastern game of 58 holes, which is otherwise absent from Cyprus. Analysis of the contexts in which these games were found could provide insight and data for comparative studies in on the mechanisms by which cultures adopt foreign games, even when the level of contact is relatively low. Compilation of long-known but inadequately documented graffiti games in Egypt (Jacquet–Gordon 2003; Piccione 1990a: 46–6) and throughout the Roman world has begun, and will provide further insights into the relationship between space and games. Similar documentation is needed with extensive evidence for board games in India that, while long recognized as a place where succeeding cultures held gaming in high importance (Soar 2007), archaeological material remains incompletely published. Similarly in China, the presence of games is recognized (Shimizu 2014), but the current state of identification and publication of gaming material does not provide the types of conclusions made here for Cyprus. In Mesoamerica, where the game *patolli* has been found as graffiti on monuments, the game similarly appears as a footnote to archaeological inquiry in the region, while more attention is paid to the more obvious

examples of play provided by monumental ball courts (Fox 1996; Hill and Clark 2011; Whalen and Minnis 1996). Better compilation of existing Mesoamerican evidence for *patolli* would help to bring a more global approach to research on ancient games, where traditionally the bulk of research has focused on the Mediterranean basin and Near East.

As a human universal, play in all its forms can inform the ways in which humans interacted with each other and the strategies they employed to harness this activity to mitigate, counteract, augment, accelerate, or otherwise influence social processes can be accessed through the archaeological record when sufficient data are present and approached with theoretically informed methods. Archaeology provides a unique insight into this kind of research as a discipline that allows considerable time depth, and the ability to see these changes through time allows one to see cumulative change that happens incrementally through individual interactions such as those that occur across a game board, as well as between players and putative spectators. As grounding tools, people use games as joint attentional scenes, bringing some of the most uniquely human cognitive abilities into contact with the engagement with contingency and the unknown that is, in many ways, exacerbated by play, thus creating an effective, yet subversive, practice that may often appear to be less serious than it is. As researchers, we must not discount play as an engine of social change, and avoid ignoring it in favor of economic, productive, "work" activities, in order to avoid the false work-play dichotomy that has, in many ways, subverted the study of play into a subject that is intellectually uninteresting. In so doing, the importance of play in ancient and present-day societies can be better understood, as another universal and perpetual human activity that can provide broader

insights into how we utilize the things that make us human on the most basic level to engage with and attempt to understand the world around us.

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Figure I.1. Map of Cyprus indicating archaeological sites that have produced games.

Table I.1. Chronological scheme of relevant Cypriot periods discussed in the text. After Knapp 2013: Table 2.

Periods	**Phase/Culture**	**Dates**
Chalcolithic	Late Chalcolithic	2700–2500/2400 BCE
Prehistoric Bronze Age 1	Philia Phase	2400/2350–2250 BCE
	Early Bronze Age I–II	2250–2000 BCE
Prehistoric Bronze Age 2	Early Bronze Age III–Middle Bronze Age II	2000–1750/1700 BCE
Protohistoric Bronze Age 1	Middle Bronze Age III–Late Bronze Age I	1700–1450 BCE
Protohistoric Bronze Age 2	Late Bronze Age IIA– IIC (early)	1450–1300 BCE
Protohistoric Bronze Age 3	Late Bronze Age IIC (late)–IIIA	1300–1125/1100 BCE
Early Iron Age	Late Bronze Age IIIB	1125/1100–1050 BCE

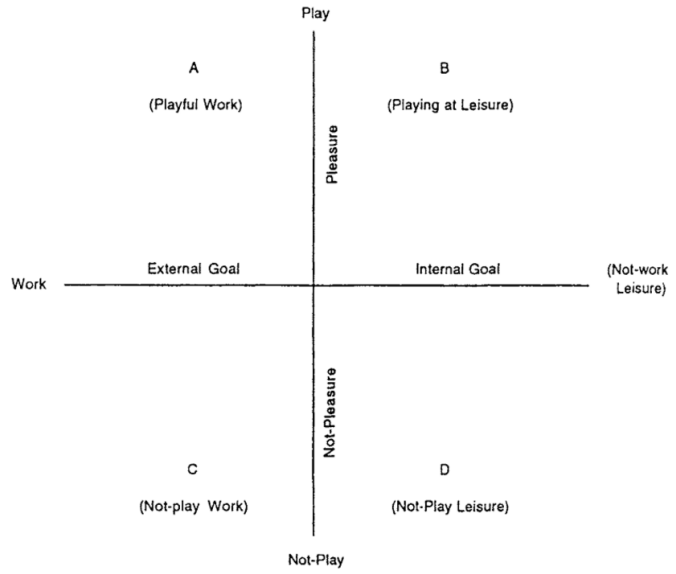


Figure I.2. Two-way schema showing the spectrum of human activity with regard to play. After Blanchard 1995: Fig. 2.1.



Figure IV.1. Examples of Cypriot *senet* (left) and *mehen* (right) games. S1064 from Sotira *Kaminoudhia* and S13 from Marki *Alonia*, respectively.

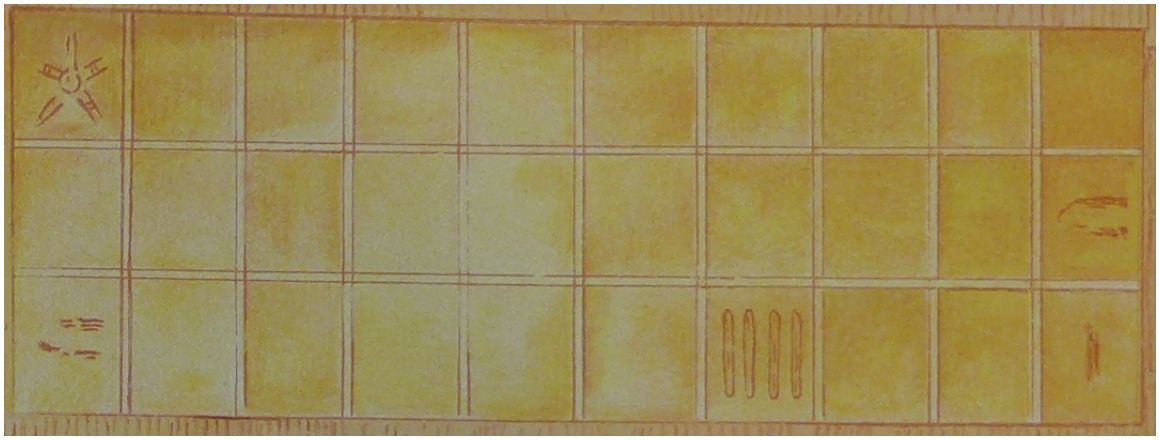


Figure IV.2. Egyptian *senet* game, as pictured on the wall of the Third Dynasty Tomb of Hesy Re at Saqqara. After Quibell 1913:Pl. XI.



Figure IV.3. Egyptian *mehen* game board, of Predynastic date but unknown provenance. © Petrie Museum of Egyptian Archaeology, University College London, UC 20453.



Figure IV.4. Game box displaying the game of twenty squares. From Thebes, Egypt, New Kingdom in date. The Metropolitan Museum of Art, Rogers Fund, 1916, 16.10.475. Image © The Metropolitan Museum of Art.

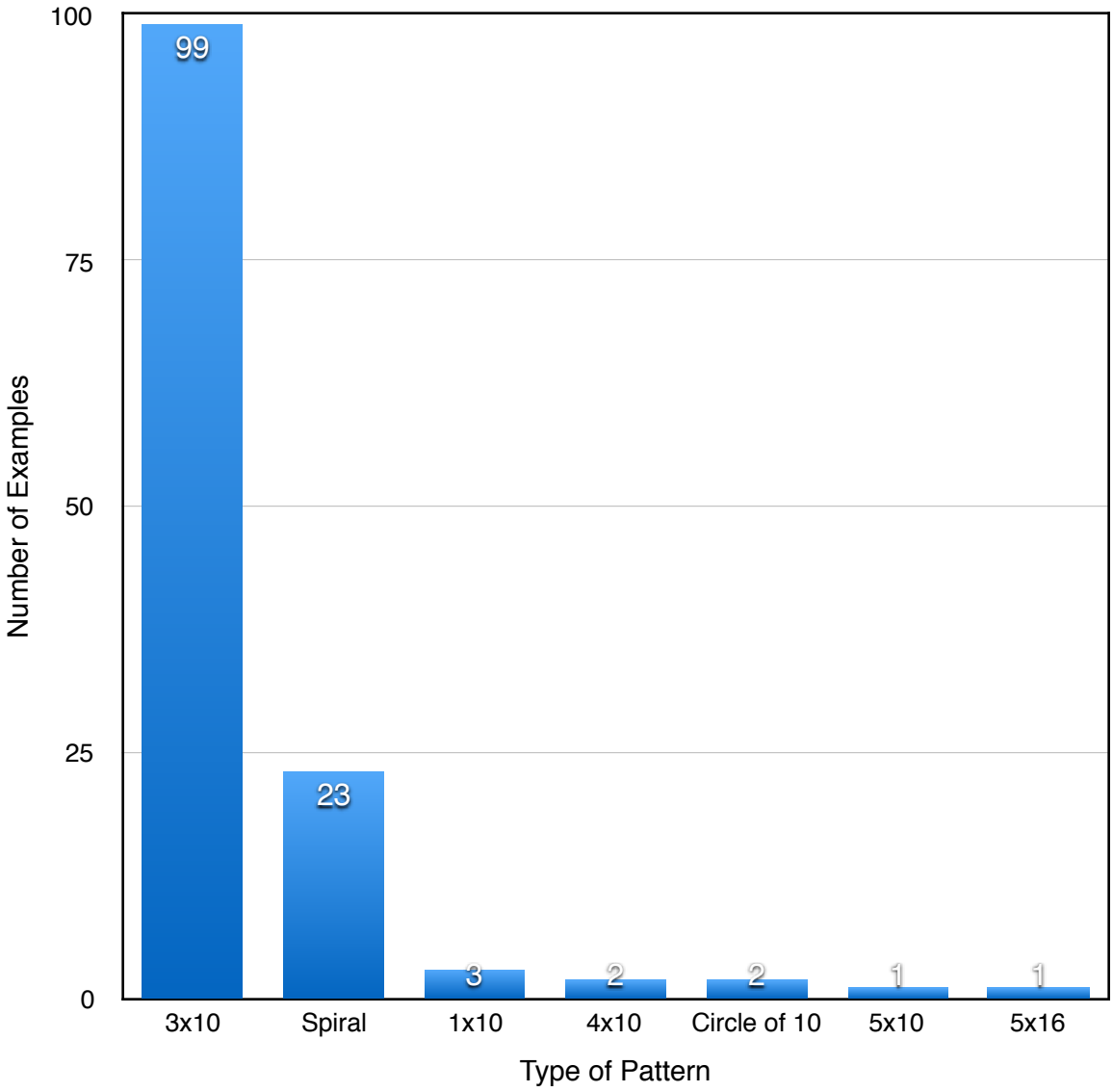


Figure IV.5. Frequency of patterns of depressions on intact Bronze Age limestone blocks from Cyprus.



Figure IV.6. *Senet* game from Arad with drilled depressions. Early Bronze Age II. Israel Museum, 1989-422. Photograph by Maria Salzberger. Courtesy of the Israel Antiquities Authority.



Figure V.1: Map of Cyprus showing sites mentioned in Chapter V.

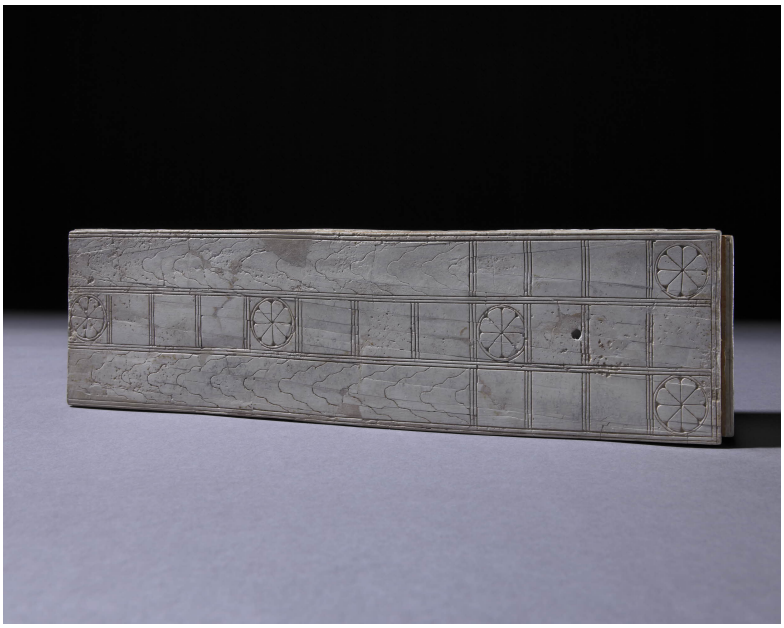


Figure V.2: View of the game box displaying the game of twenty squares from Enkomi.

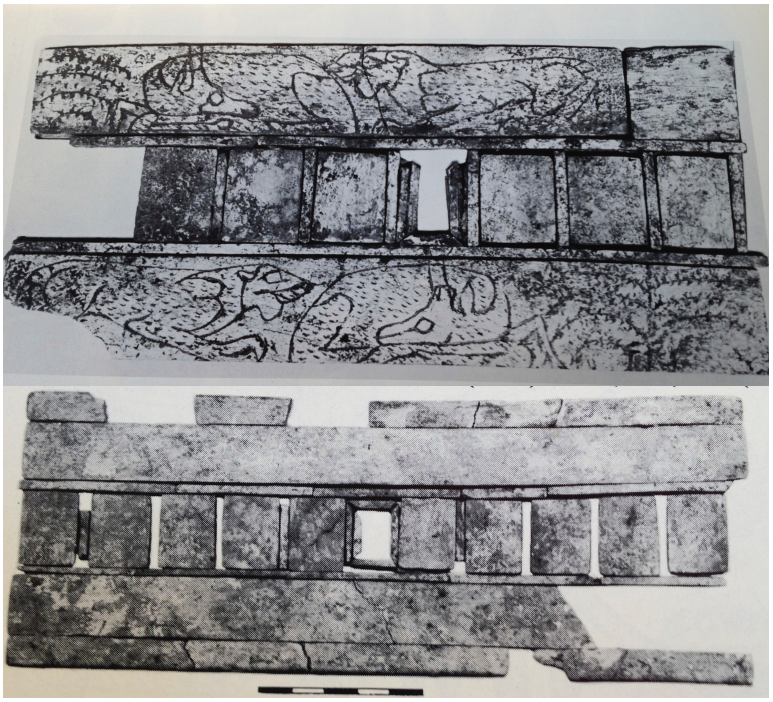
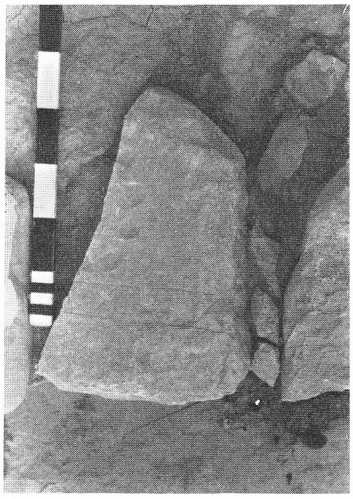
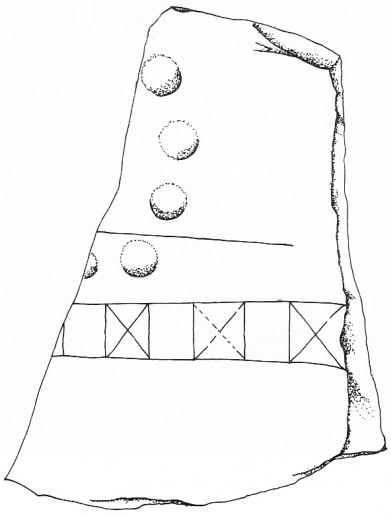


Figure V.3: Fragments of game boxes with the game of twenty squares from the Ashlar Building, Room 27 at Enkomi. 657b (top), 657a (bottom). After Dikaios 1969: Pl. 128.65–66.



3. Gaming stone.



4. Ashlar block. Scale : 1 : 4.

Figure V.4: Game from Hala Sultan Tekke displaying a fragmentary game of twenty squares and 10-Ring. After Åström 1984a.

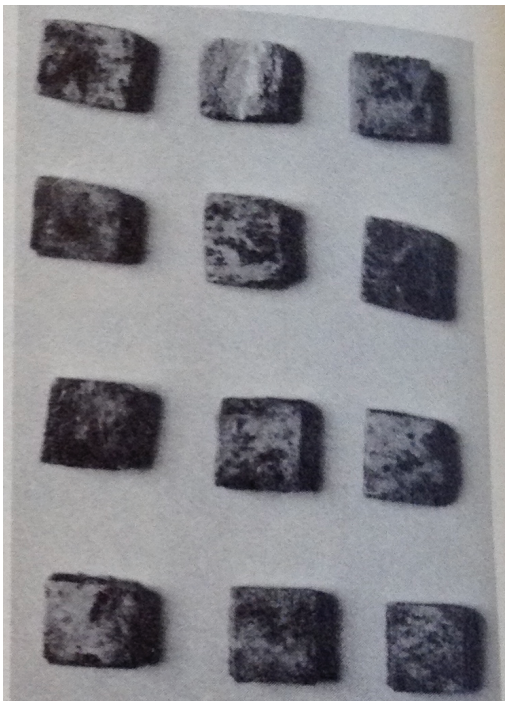


Figure V.5: Fragments of ivory inlays, likely remnants of a game of twenty squares from Morphou *Toumba you Skourou.* After Vermeule and Wolsky 1990.

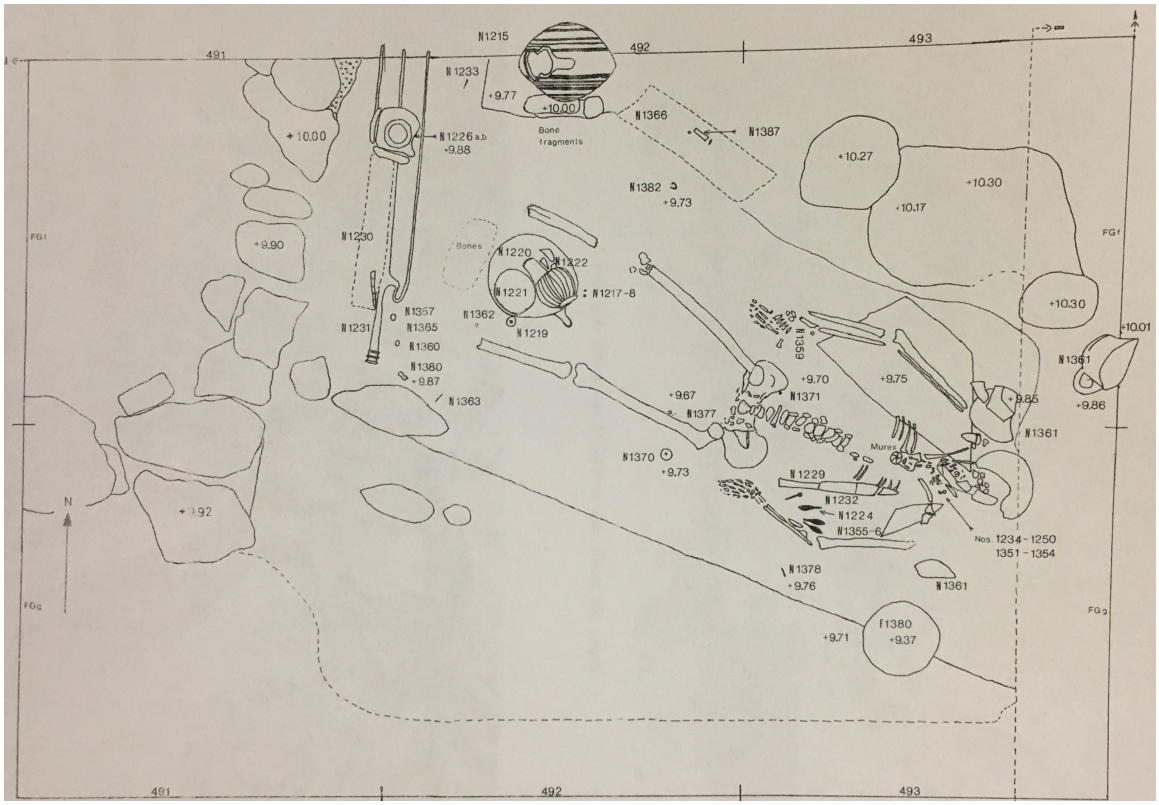


Figure V.6: Plan of Tomb 23 from Hala Sultan Tekke, showing gaming paraphernalia (N1366, N1357, N1365, N 1380), probably from a game of twenty squares, associated with the burial. After Niklasson 1983: Fig. 419.

Table VI.1: Cypriot sites that have produced gaming stones, in descending order of number discovered.

Site	Number of Games	Site	Number of Games
Sotira *Kaminoudhia*	63	Anoyira *Ayios Ioannis*	2
Marki *Alonia*	44	Erimi *Pitharka*	2
Episkopi *Phaneromeni*	42	Kalavasos *Malouteri*	2
Politiko *Troullia*	31	Politiko *Tamassos*	2
Evdhimou *Beyouk Tarla*	26	Pyla *Kokkinokremos*	2
Epskopi *Bamboula*	21	Bellapais *Vounous*	1
Anoyira *Peralijithias*	19	Deneia *Kafkalla*	1
Evdhimou *Stympouli*	9	Dromolaxia *Trypes*	1
Alambra *Mouttes*	8	Evdhimou *Ambelovounos*	1
Aredhiou *Vouppes*	8	Kalavasos *Arkhangelos*	1
Kouklia *Skales*	8	Kalavasos *Laroumena*	1
Maroni *Vournes*	8	Kition *Terra Umbra*	1
Kissonerga *Skalia*	6	Lemba *Lakkous*	1
Kition *Kathari*	5	Magounda *Kokkinokampos*	1
Kouklia *Marcello*	5	Marion	1
Maa *Palaeokastro*	5	Marki *Kappara*	1
Maroni *Tsaroukkas*	5	Marki *Pappara*	1
Amathus	4	Maroni *Kapsaloudhia*	1
Anoyira *Livadhia*	4	Morphou *Toumba tou Skourou*	1
Erimi *Kafkalla*	4	Paramali *Mandra tou Poppou*	1
Evdhimou *Alatoni*	4	Phlamoudhi *Vounari*	1
Hala Sultan Tekke	4	Psematismenos *Trelloukas*	1
Paramali *Lochos*	4	Sarama *Aishetou*	1
Evdhimou *Shilles*	3	Sterakovou	1
Kalavasos *Ayios Dhimitrios*	3	Tokhni *Oriti North*	1
Paramali *Pharkonia*	3	Total:	376

Table VI.2: Tabulation of periods represented by sites with games in primary context.

	Sotira *Kaminoudhia*	Marki *Alonia*	Alambra *Mouttes*	Episkopi *Phaneromeni*	Morphou *Toumba tou Skourou*	Maroni *Tsaroukkas*	Maa *Palaeokastro*
PreBA 1	X	X					
PreBA 2	X	X	X				
PreBA 3			X				
ProBA 1				X	X		
ProBA 2					X	X	X
ProBA 3							X

Table VI.3: Museums in which gaming stones utilized in this study are currently

Museum	**Sites**
Cyprus Museum, Nicosia	Alambra *Mouttes,* Marki *Alonia* (partial)
Larnaca District Archaeological Museum, Larnaca	Marki *Alonia* (most), Kalavasos *Ayios Dhimitrios,* Hala Sultan Tekke, Maroni *Vournes,* Pyla *Kokkinokremos*
Kourion Museum, Episkopi	Sotira *Kaminoudhia*, Episkopi *Phaneromeni*, Episkopi *Bamboula*, sites from Episkopi Area Survey (Swiny 1981), Marion, Marki *Kappara*, Bellapais *Vounous*
Paphos District Archaeological Museum, Paphos	Maa *Palaeokastro,* Kissonerga *Skalia*



Figure VII.1: Four row pattern of depressions (S5) from Maroni *Vournes.*



Figure VII.2: 10-Ring game (10416) from Episkopi *Bamboula.*

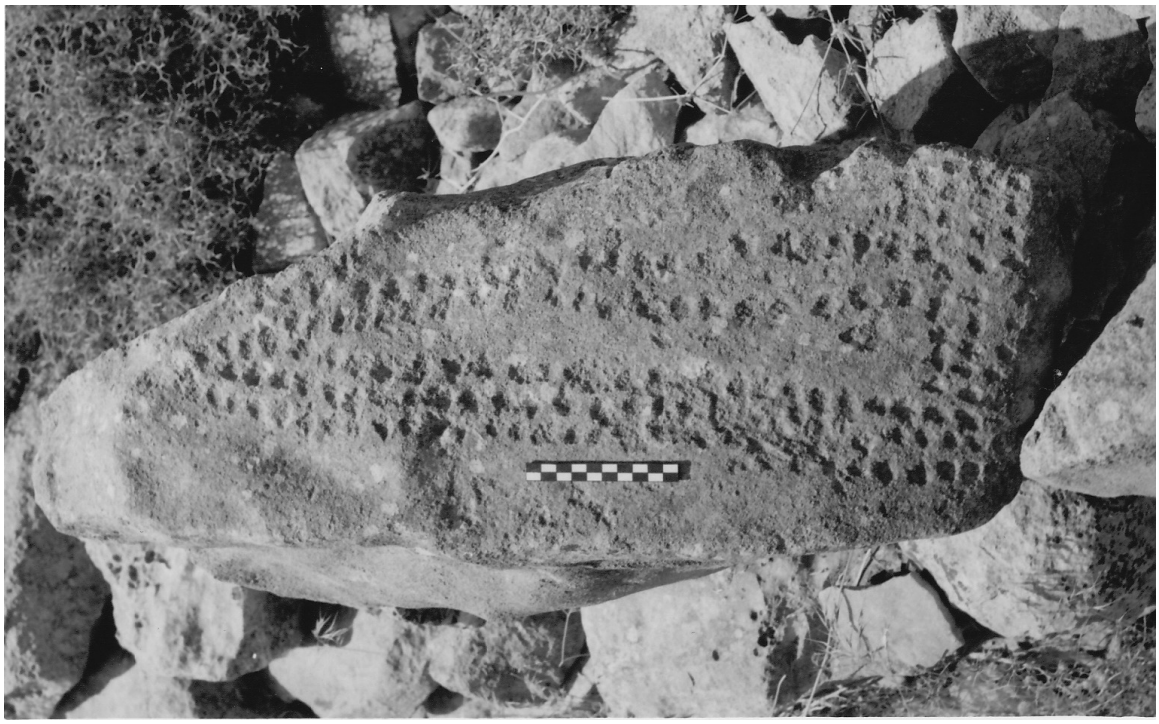


Figure VII.3: Stone with 147 depressions forming a circle from Anoyira *Peralijithias*.



Figure VII.4: Intersecting *senet* patterns at Anoyira *Peralijithias*. Photo by Stuart Swiny.



Figure VII.5: Pillow lava *senet* game (B.313) from Alambra *Mouttes*.



Figure VII.6: *Senet* game (S416) on a stone from the Kouris River found at Episkopi *Phaneromeni*.



Figure VII.7: Detail of S425 from Sotira *Kaminoudhia* showing individual strike marks in depressions from pecking.



Figure VII.8: Detail of S503 from Marki *Alonia* showing what may be drilled holes.



Figure VII.9: S193 from Episkopi *Phaneromeni* showing a single row of a *senet* pattern near the bottom edge of the stone in the right view, and a complete *senet* on the opposite face, left.



Figure VII.10: S1064 from Sotira *Kaminoudhia* showing an incomplete *senet* pattern, right and a complete *senet* on the opposite face, left.



Figure VII.11: S392 from Episkopi *Phaneromeni* showing a single row of faint depressions, probably an incomplete *senet*.



Figure VII.12: S37 from Evdhimou *Beyouk Tarla* showing an incomplete *senet* pattern.



Figure VII.13: S355 From Marki *Alonia* showing an incomplete *mehen* pattern.



Figure VII.14: S457 from Marki *Alonia* showing a poorly executed *senet* patten (three upper rows) next to a more carefully aligned pattern (three lower rows).



Figure VII.15: S613 from Sotira *Kaminoudhia* showing a worn *senet* pattern in the upper left corner, the *senet* pattern replacing it in the center of the stone, and an ephemeral row to the right of the central pattern.



Figure VII.16: 17 from Episkopi *Bamboula,* showing three rows of depressions with a fourth row of larger, non-parallel depressions.



Figure VII.17: 132-1 from Tokhni *Oriti-North.* Lower three rows are well-defined, which the upper two rows are ephemeral and not likely part of the intended pattern.



Figure VII.18: S328 from Maroni *Vournes* showing three rows of ten depressions in a *senet* pattern along with non-parallel, indeterminately placed pattern of depressions to the right.



Figure VII.19: S211 from Marki *Alonia* showing three closely placed rows of depressions running diagonally tin the top right corner of the stone, and a fourth row further removed from this pattern.



Figure VII.20: CHM-RR325 from Episkopi *Phaneromeni* showing clearly defined, well-made senet on one face (left), and a less well-defined pattern on the opposite face (right).



Figure VII.21: S244 from Episkopi *Phaneromeni,* a *senet* game with a large auxiliary depression to the left of the pattern.



Figure VII:22: CHM-RR 329 from Episkopi *Phaneromeni,* a *mehen* game with a large auxiliary depression in the center of the spiral. Photo by Stuart Swiny.



Figure VII:23: S231 from Episkopi *Phaneromeni* showing a bisected *senet* pattern on both faces.



Figure VII.24: 10412 from Episkopi *Bamboula,* a *senet* game bisected by an incised line.



Figure VII:25: G2 from Hala Sultan Tekke, a *mehen* game with a large central depression.



Figure VII.26: 682 from Maa *Palaeokastro,* a *mehen* game with a large central depression.



Figure VII.27: AS6 from Marki *Kappara,* with *senet* on both sides that has been rendered unplayable by a large depression pecked across the playing field.



Figure VII.28: Terracotta *senet* votive, probably from a grave at Marki, from the Hadjiprodromou collection. Photo courtesy of Stuart Swiny.

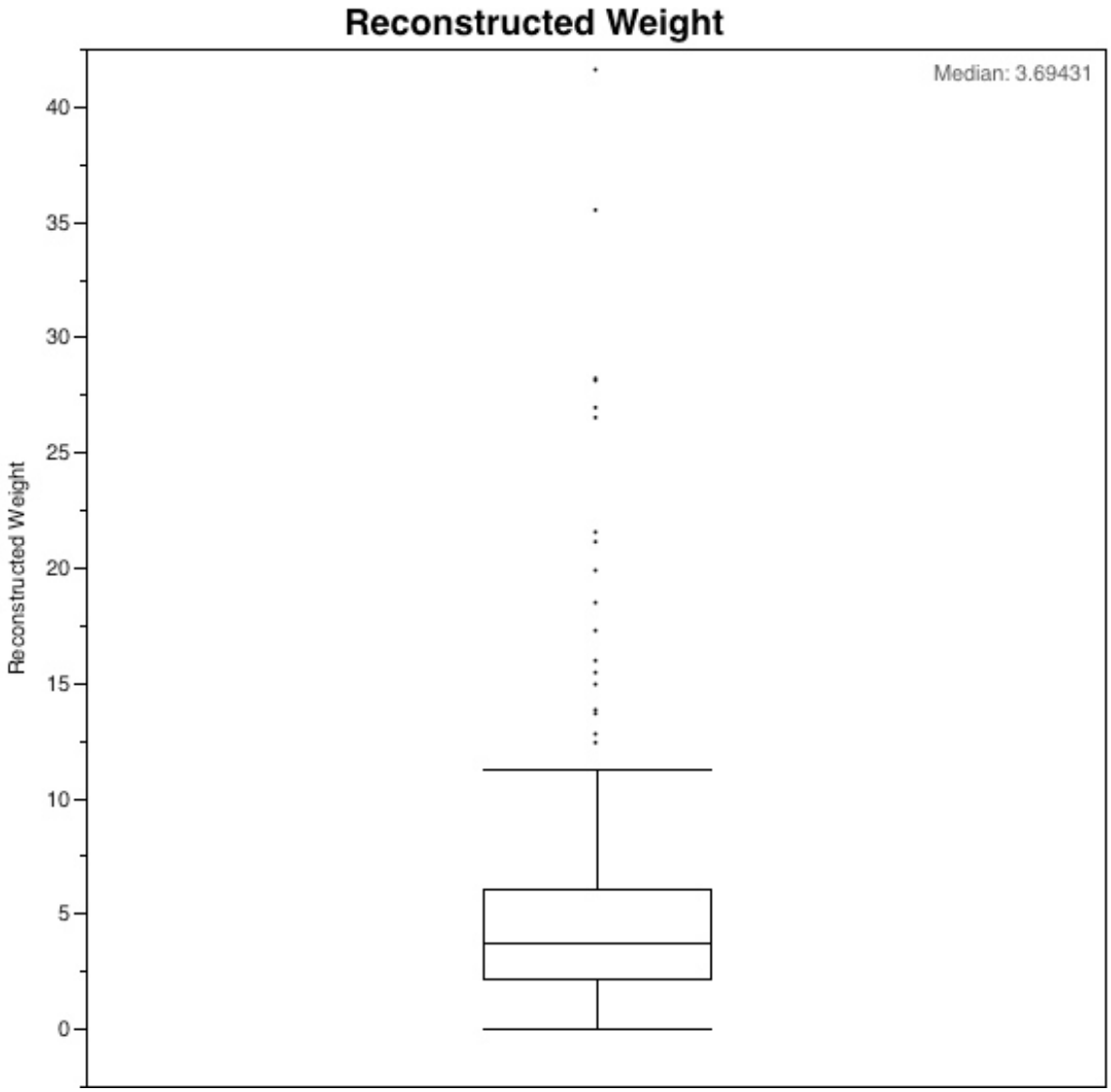


Figure VII.29: Box plot of reconstructed weights of Bronze Age gaming stones from Cyprus.

Table VII.1: Gaming Spaces at Cypriot Bronze Age sites as determined by the presence of heavy, immobile and/or clusters of games.

Space	**Game(s)**	**Heavy/fixed/cluster**	**Open air/roofed**
Sotira *Kaminoudhia* Unit 12 Complex		heavy (S1086), cluster	open-air
-*Unit 12*	Senet: S325, S424, S467, S991, S1085, S1086		
	Double-sided senet/mehen: S425, S1084		
-*Unit 12a*	Double-sided senet/ mehen: S748		
-*Unit 12c*	Senet: S851, S859, S887, S888, S958		
Sotira *Kaminoudhia* Unit 10	Senet: S77, S78, S80, S102, S109, S114, S234, S727,	cluster	roofed
Episkopi *Phaneromeni* Unit 13	Senet: S21, S137, S138	heavy (S138), cluster	partially roofed?
Episkopi *Phaneromeni* Unit 19	Senet: S193, S194, S319	cluster	partially roofed?
Sotira *Kaminoudhia* Unit 21	Senet: S546, S613	cluster	open-air
Sotira *Kaminoudhia* Unit 2	Senet: S71, S72	cluster	open-air
Marki *Alonia* Unit LXV, G-1	Mehen: S150	heavy	roofed?
Sotira *Kaminoudhia* Unit 4	Senet: S163	heavy	open-air
Alambra *Mouttes* Rooms 3/7	Senet: B310	fixed	roofed
Marki *Alonia* Unit CIII, H-1	Senet: S521	fixed	roofed
Maa *Palaeokastro* Areas 76/96	Senet: I	fixed	transitional
Maa *Palaeokastro* Areas 77/88	Senet: II	fixed	transitional

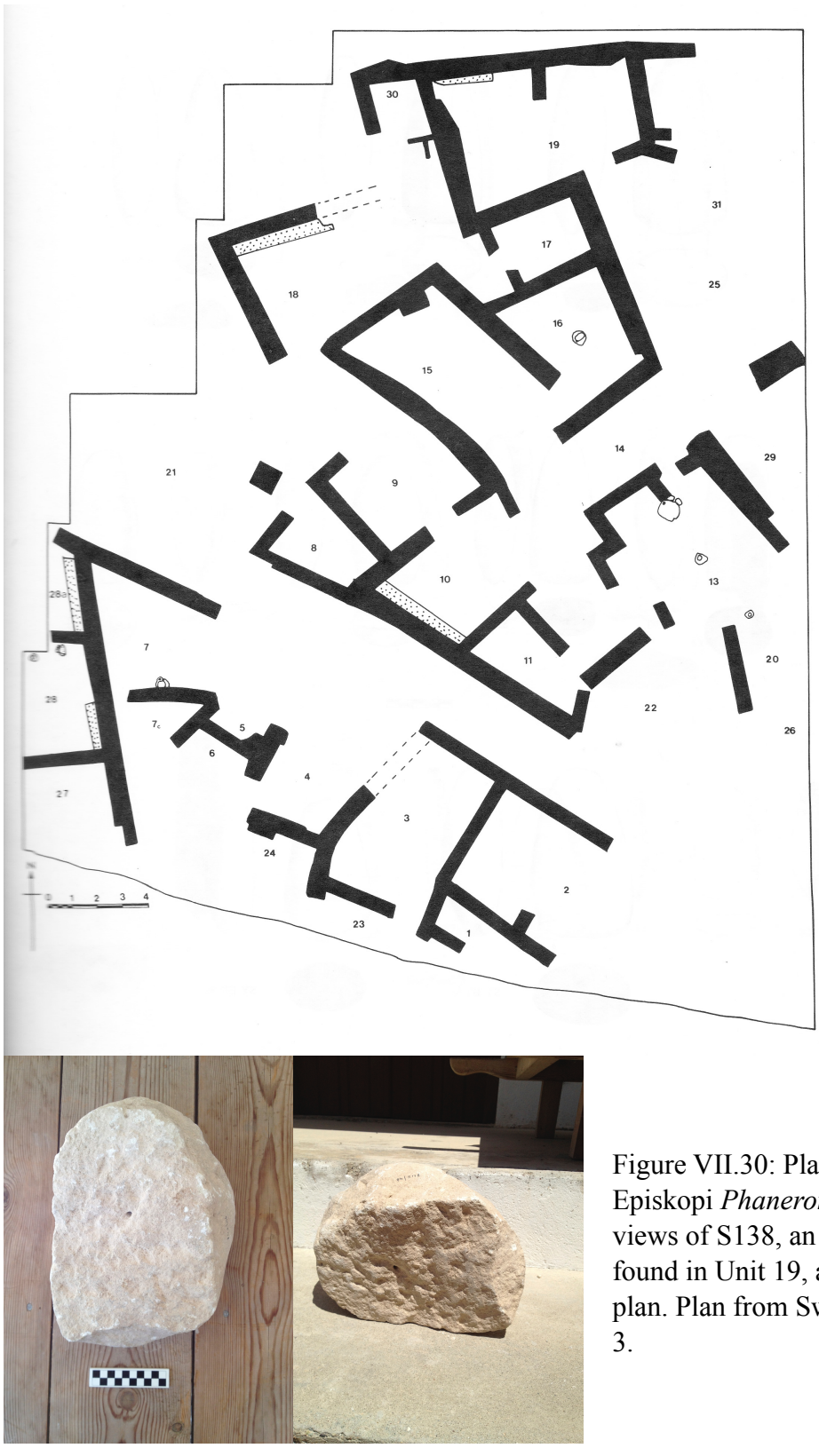
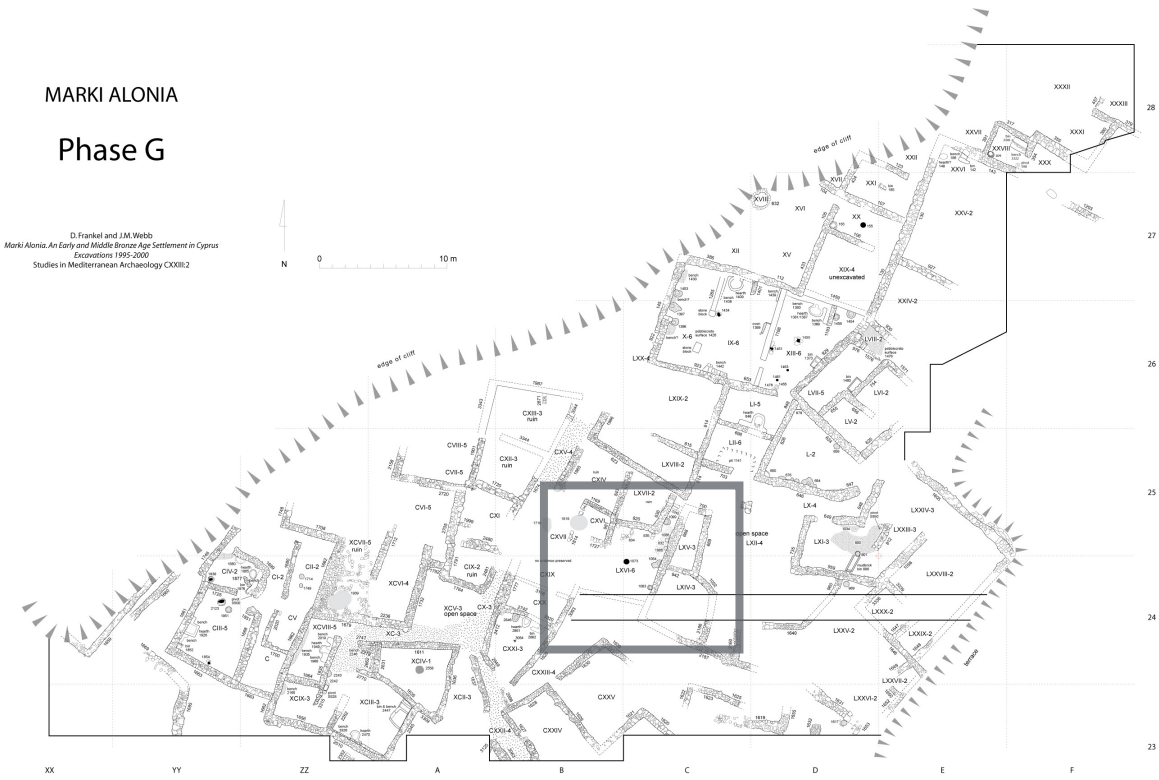


Figure VII.30: Plan of Area A at Episkopi *Phaneromeni* with two views of S138, an immobile game found in Unit 19, at the top of the plan. Plan from Swiny 1986a: Fig. 3.





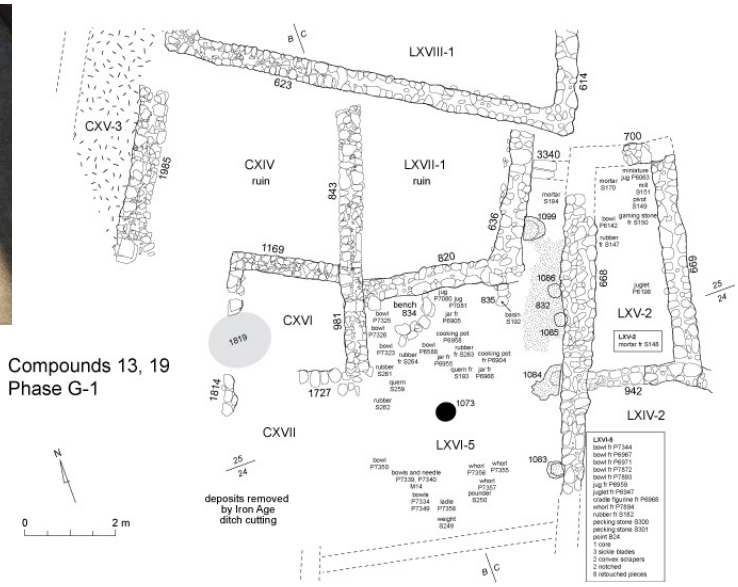


Figure VII.31: Plan of Phase G at Marki *Alonia,* showing. Detail to right shows Unit LXV on the far right. Inset indicated by rectangle on top map. S150, immobile game found in LXV shown above. Plan from Frankel and Webb 2006a.



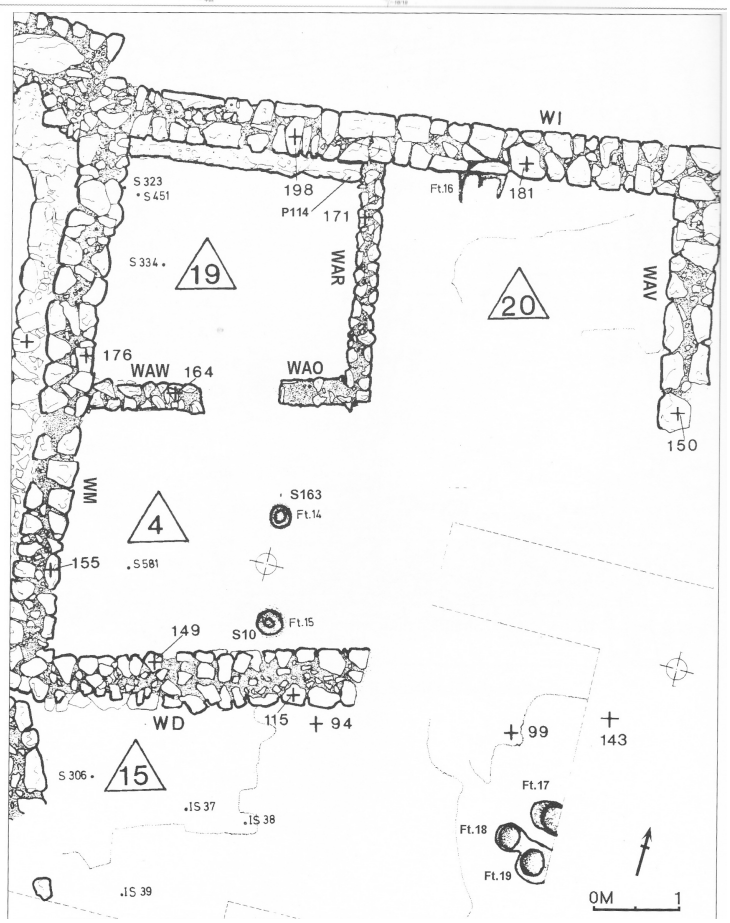


Figure VII.32: Plan of Area A at Sotira *Kaminoudhia,* with detail of Unit 4 and adjacent spaces. From Swiny 2008 and Swiny *et al.* 2003.

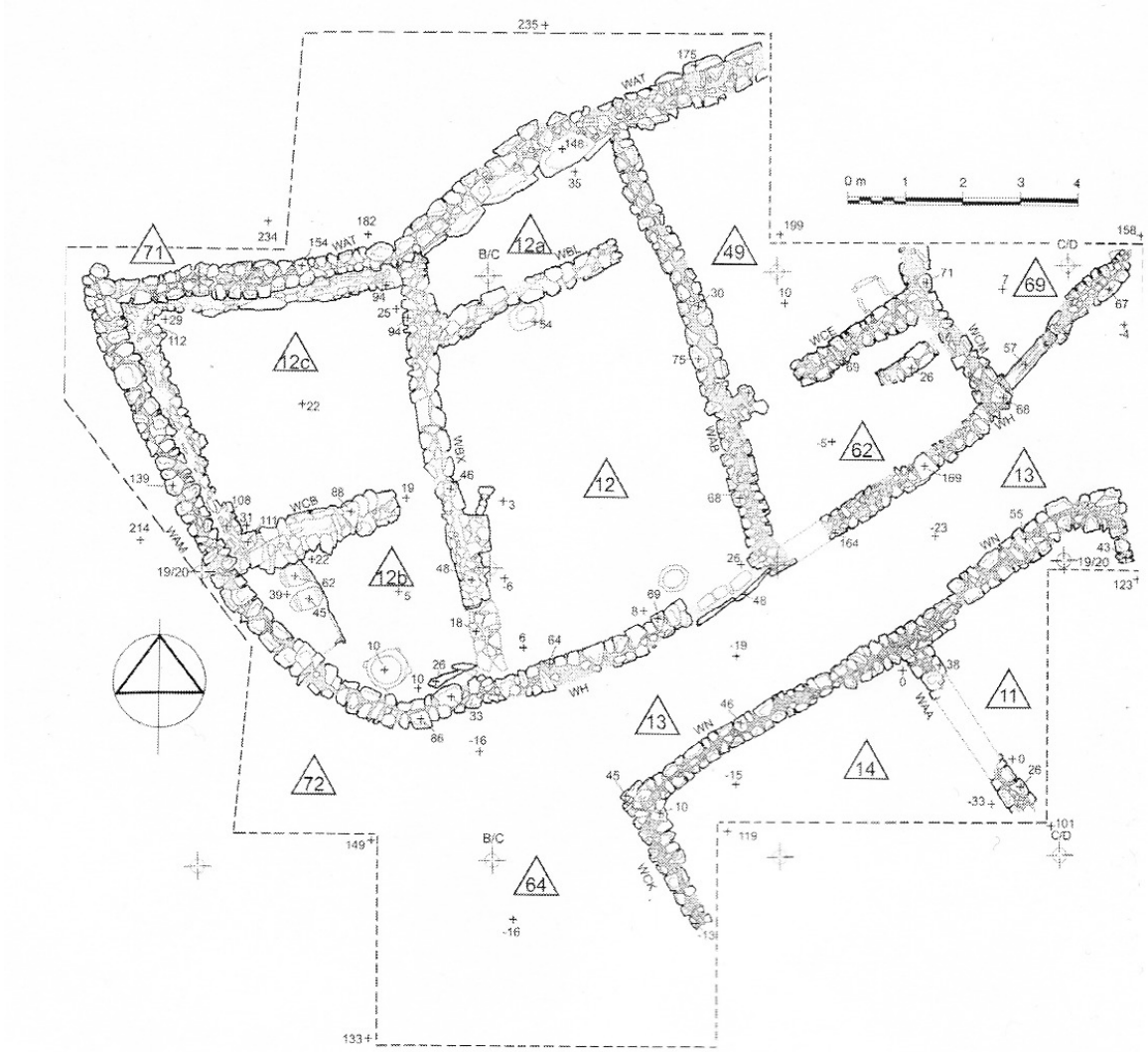




Figure VII.33: Plan of Area B at Sotira *Kaminoudhia* and S1086, an immobile game found in Unit 12. Plan from Swiny 2008: 48.

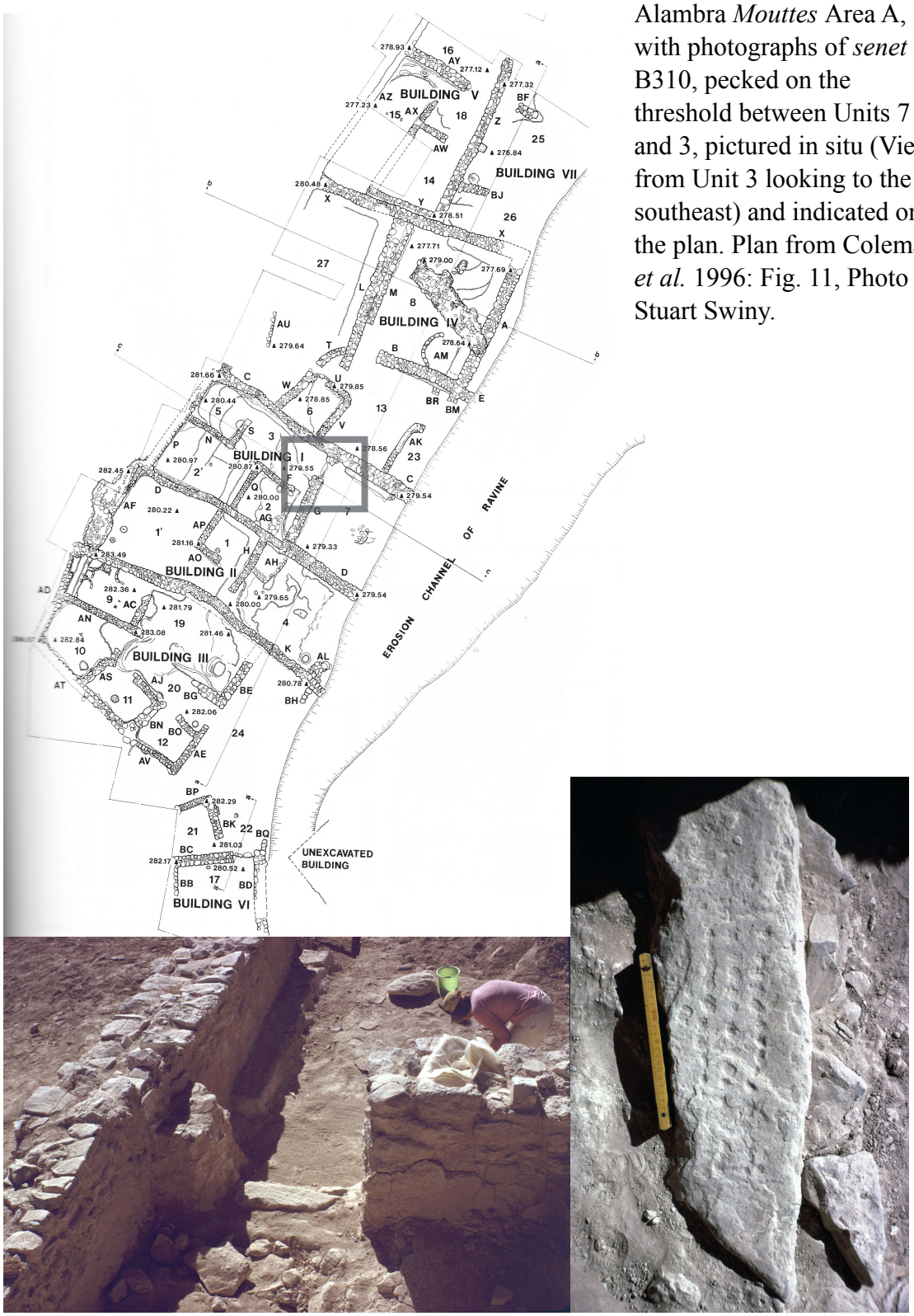


Figure VII.34: Plan of Alambra *Mouttes* Area A, with photographs of *senet* B310, pecked on the threshold between Units 7 and 3, pictured in situ (View from Unit 3 looking to the southeast) and indicated on the plan. Plan from Coleman *et al.* 1996: Fig. 11, Photo by Stuart Swiny.





Figure VI.35: Plan of Area 8 at Hala Sultan Tekke, where immobile game N1401, pictured below, was found in Building C, Room 14, indicated on the plan. Plan from Åström 1989.

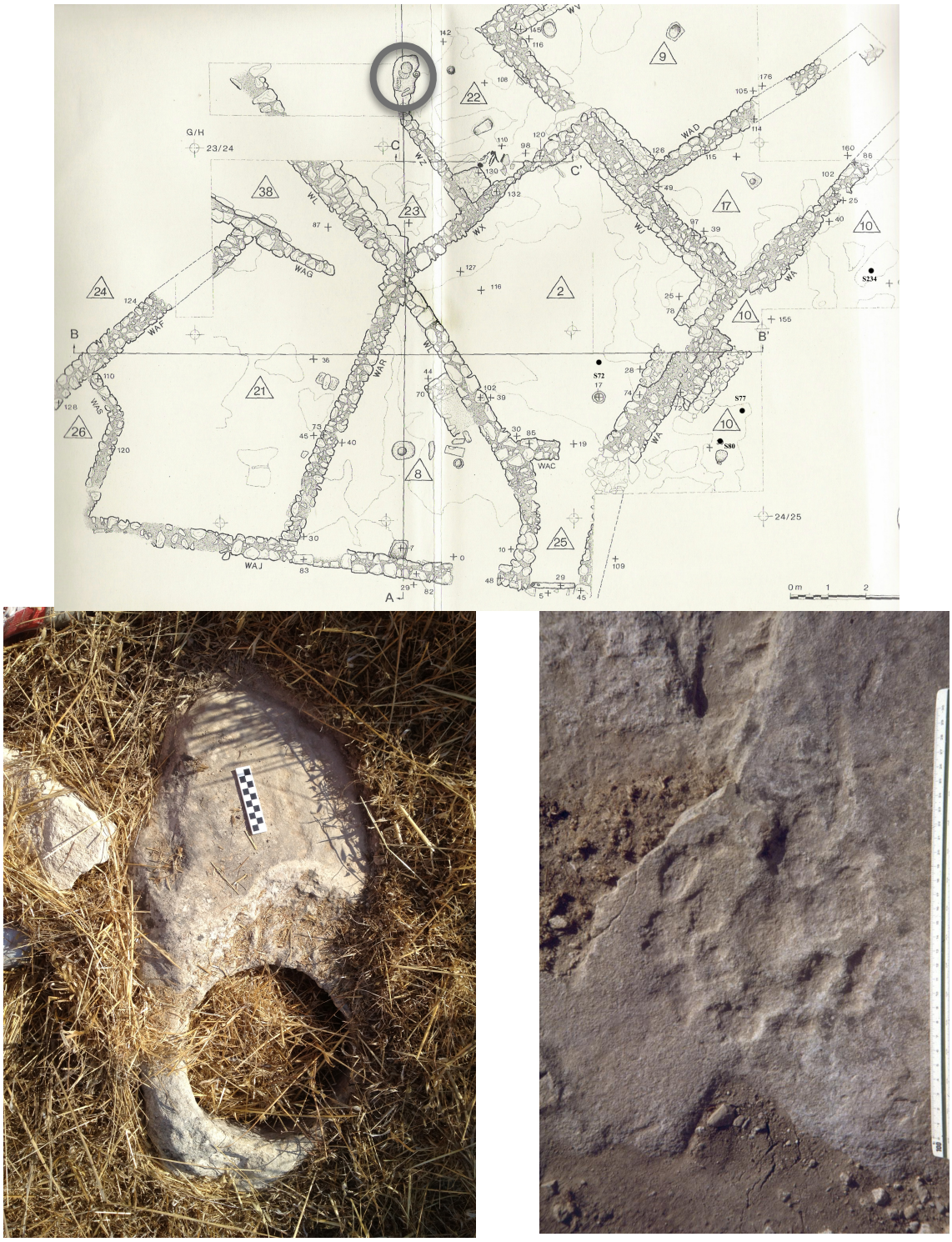


Figure VII.36: Plan of Area C, above, and the two fixed games found there, Ft25, left, found in Unit 22 (indicated on plan) and the *mehen* found to the east of the plan, right, now under a modern road.

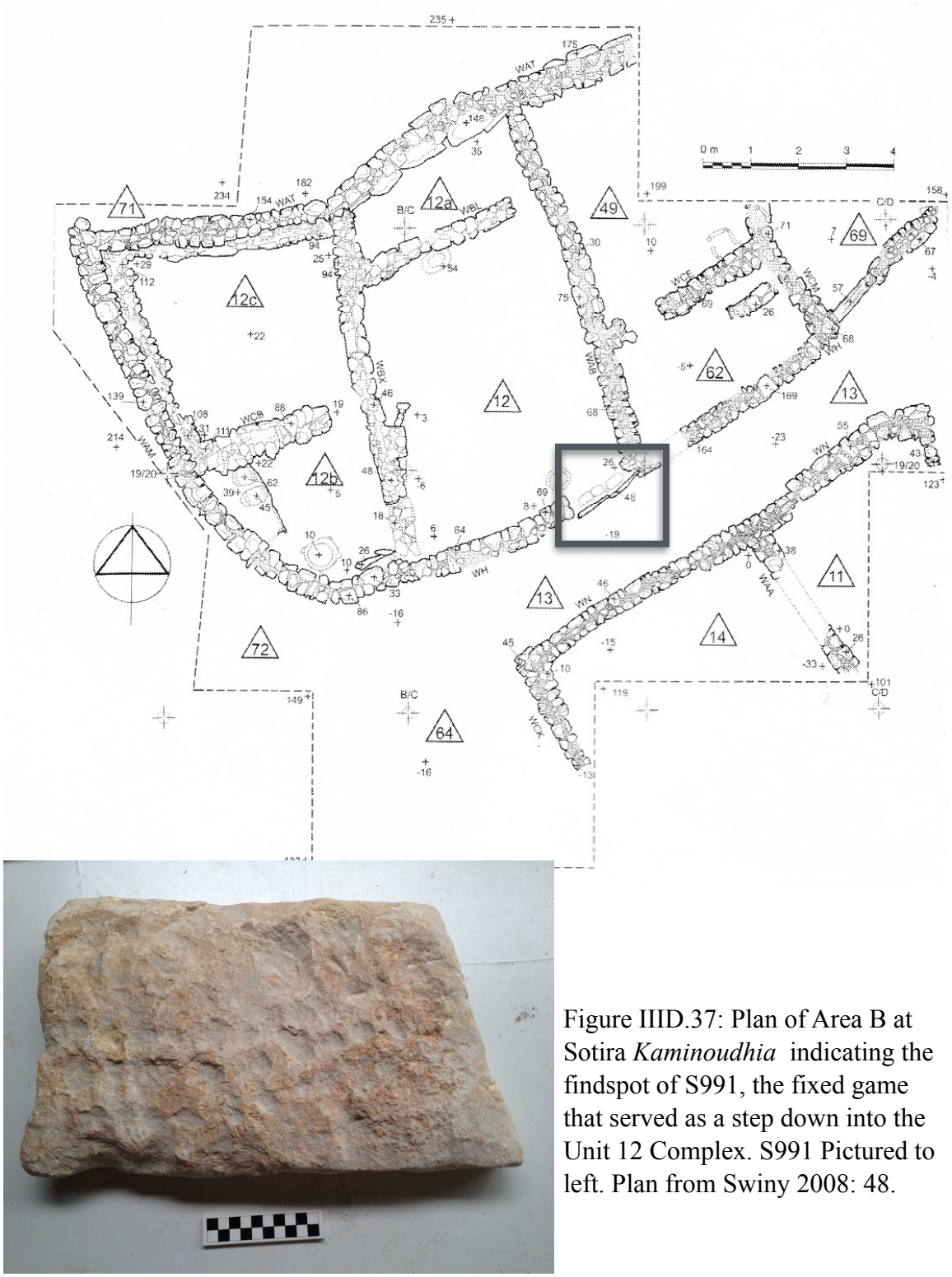


Figure IIID.37: Plan of Area B at Sotira *Kaminoudhia* indicating the findspot of S991, the fixed game that served as a step down into the Unit 12 Complex. S991 Pictured to left. Plan from Swiny 2008: 48.

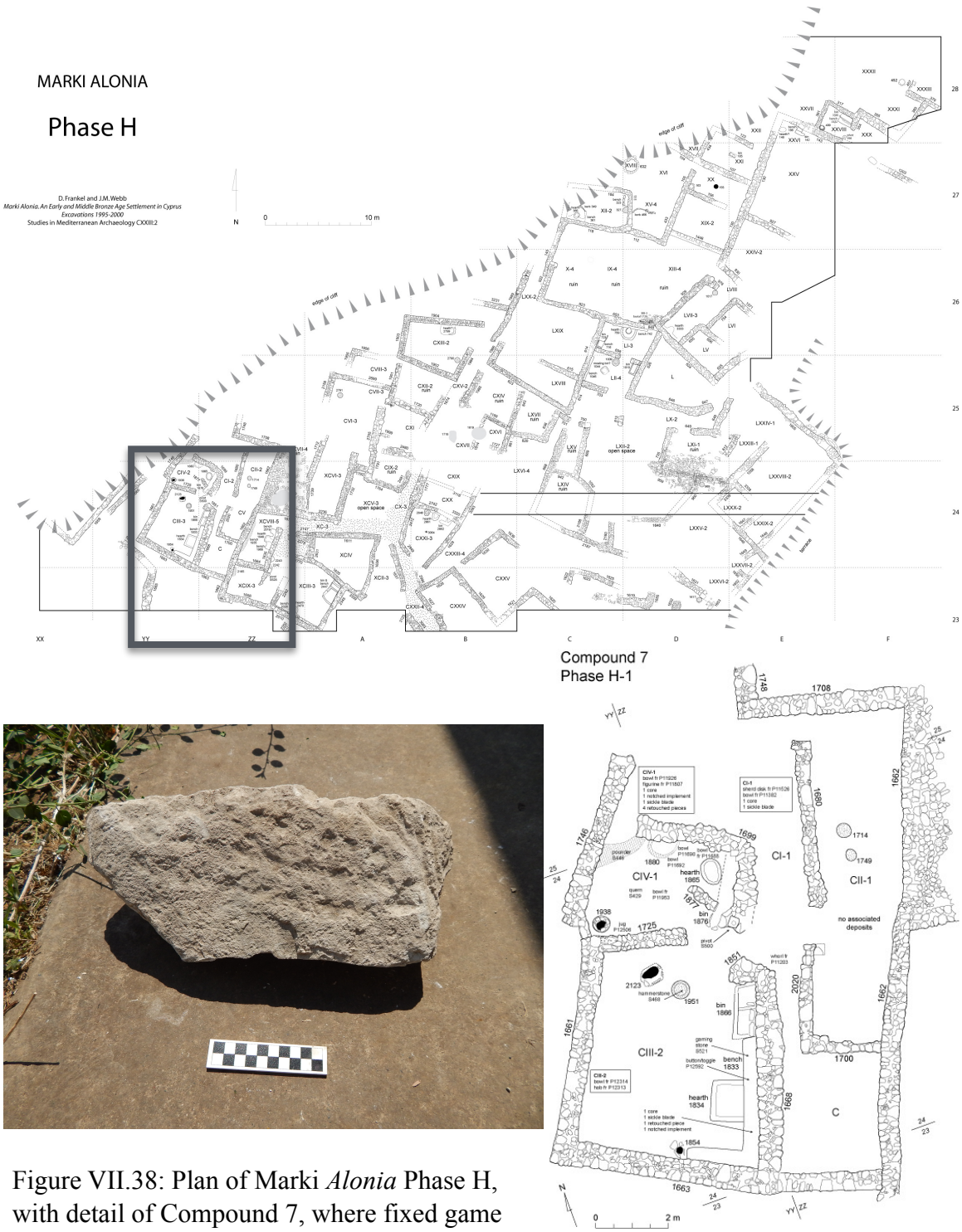


Figure VII.38: Plan of Marki *Alonia* Phase H, with detail of Compound 7, where fixed game S521, shown below, was found on the eastern bench of Unit CIII. Plans from Frankel and Webb 2006a.

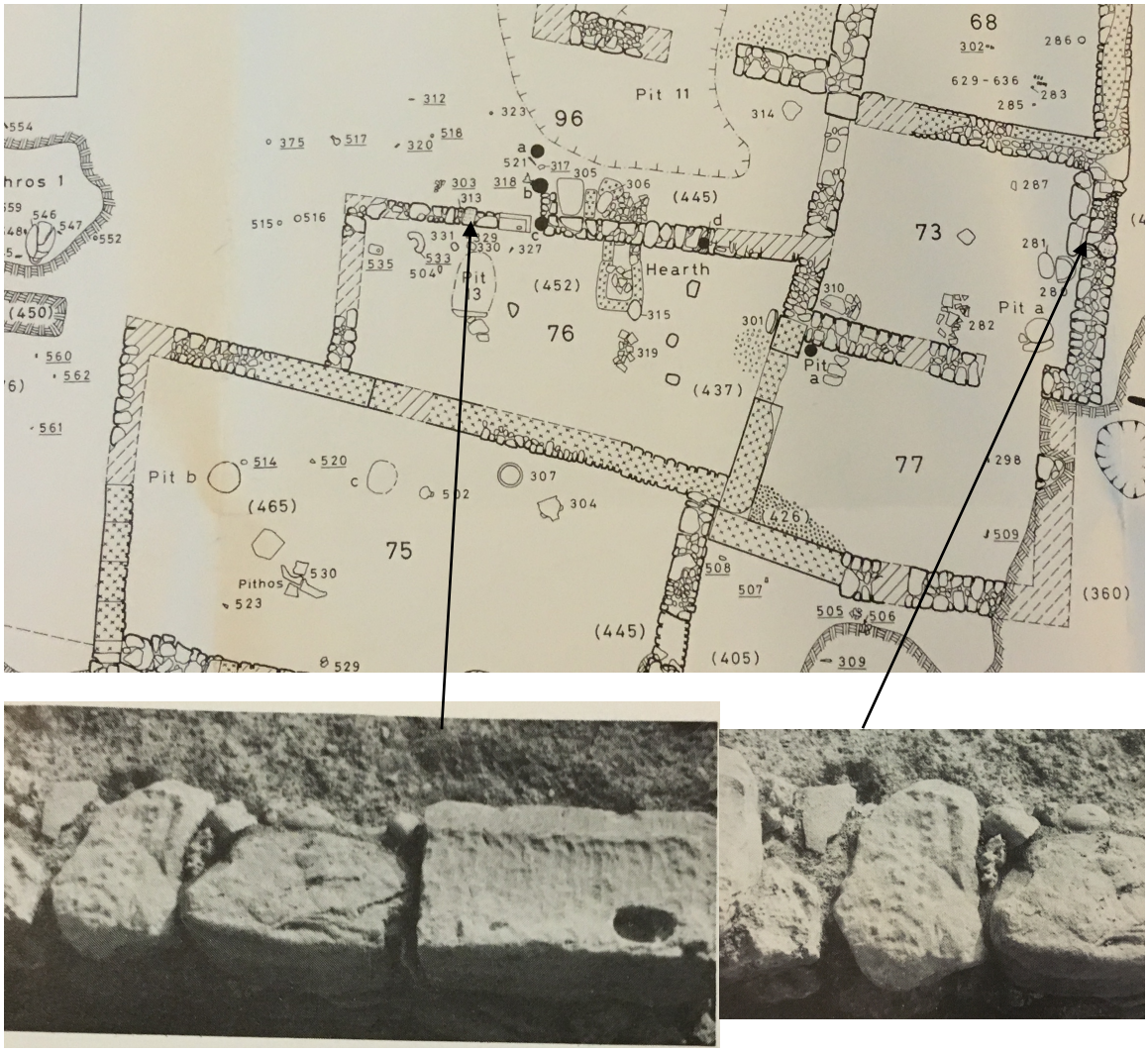


Figure VII.39: Plan of Maa *Palaeokastro*, with detail of rooms 73/76/77/96. Placement of games on thresholds indicated on the detail plan. Plan and photos from Karageorghis and Demas 1988.

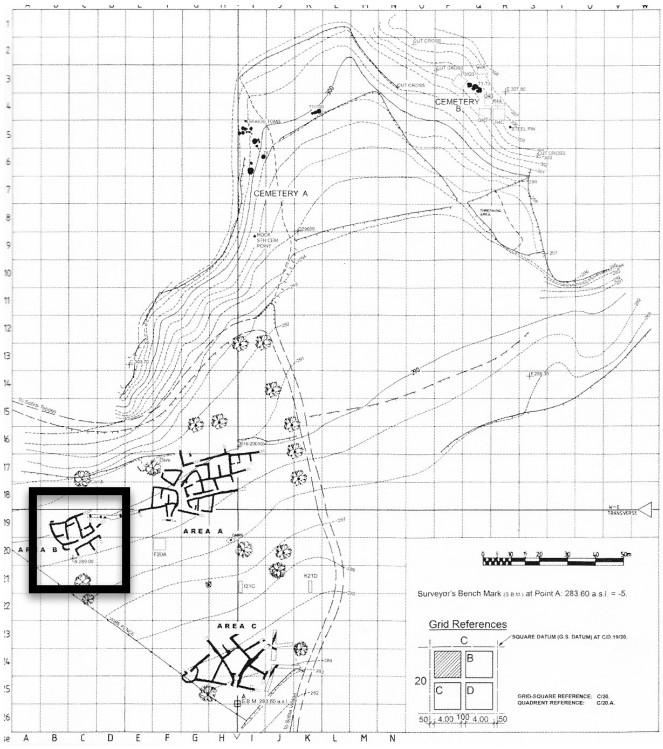
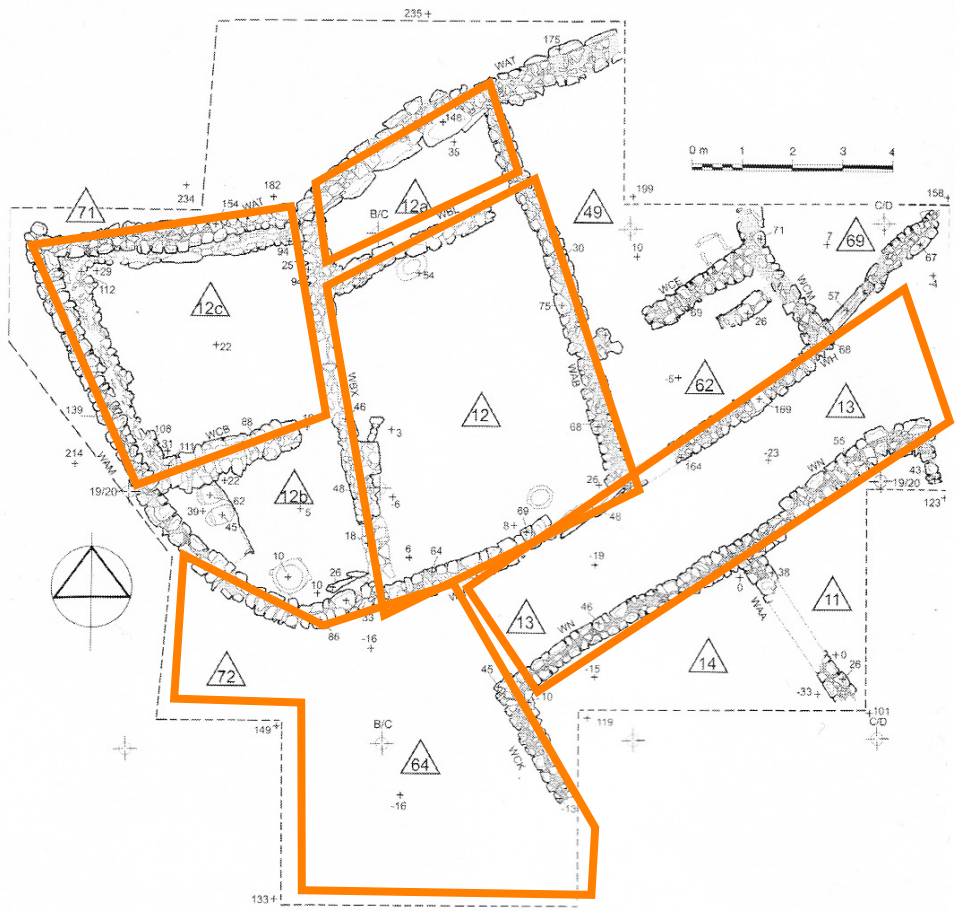


Figure VII.40: Area B at Sotira *Kaminoudhia*, indicating units in which games were found. Plans from Swiny 2008.



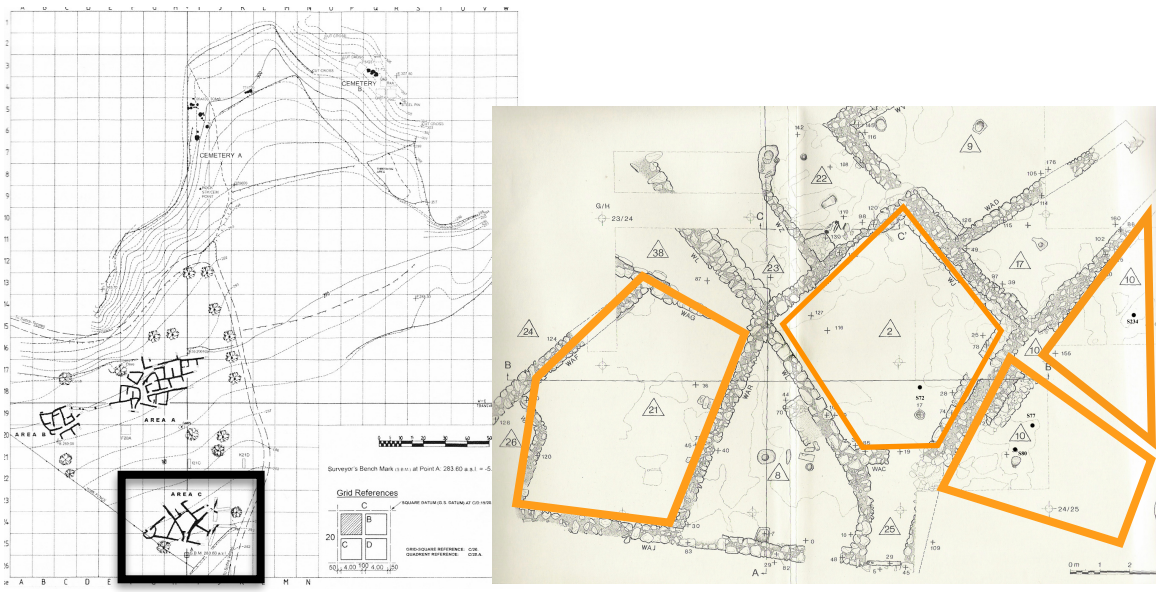


Figure IIID.41: Area C at Sotira *Kaminoudhia* indicating units in which games were found. Plans from Swiny *et al.* 2003 and Swiny 2008.

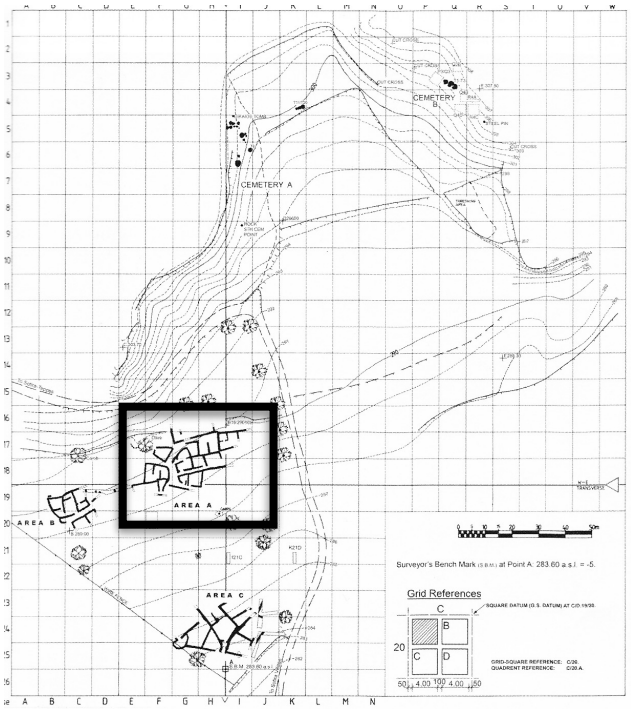


Figure VII.42: Area A at Sotira *Kaminoudhia,* indicating units in which games were found (below). Plans from Swiny 2008.



Plan of Area A at Sotira *Kaminoudhia*. The most striking aspect of the settlement's architecture is the lack of a standard building plan. Rectangular units are found next to square and triangular ones and others even incorporate curvilinear walls.

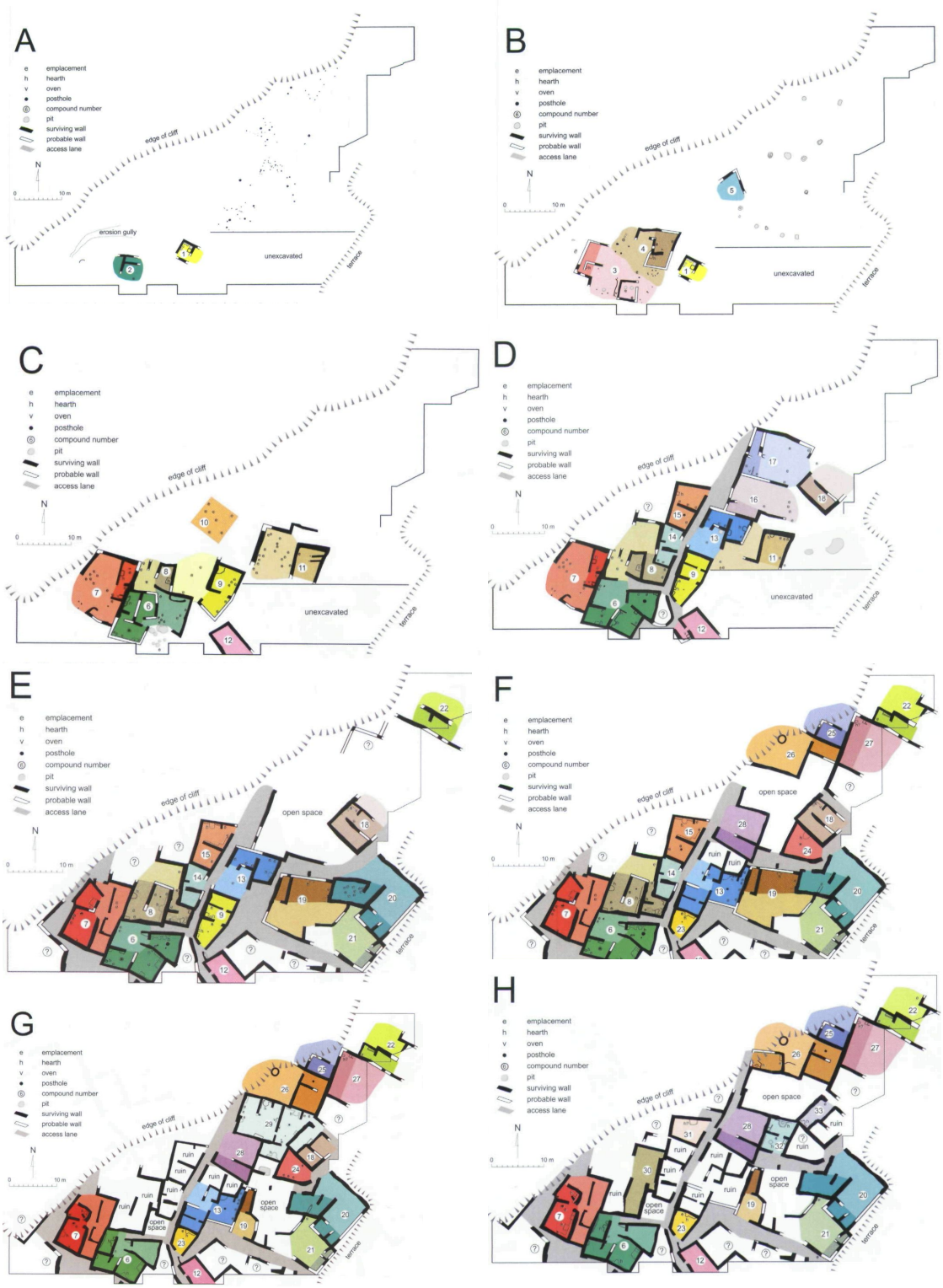


Figure VII.43: Plan of successive phases of occupation at Marki *Alonia.* Plans from Frankel and Webb 2006b.

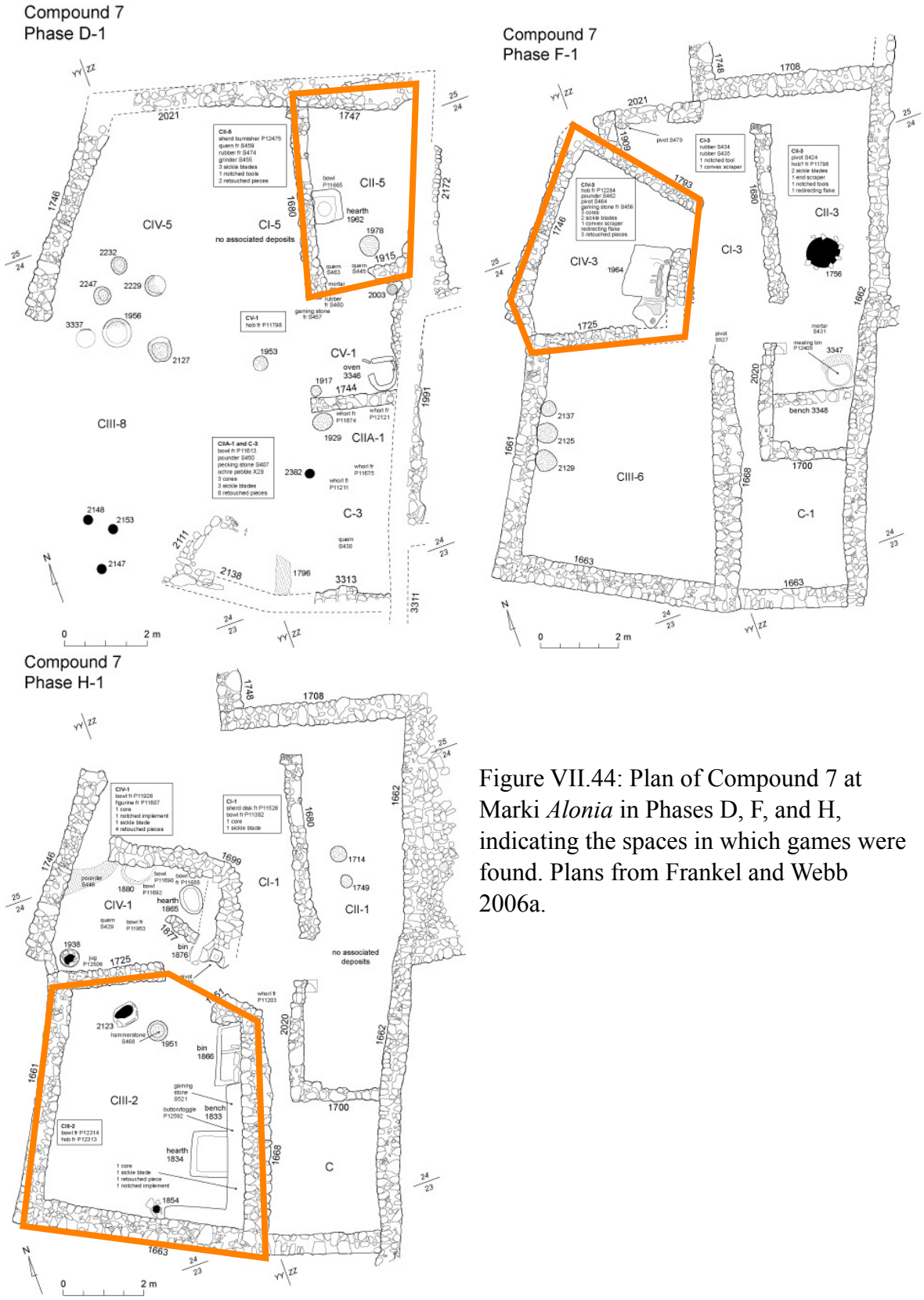


Figure VII.44: Plan of Compound 7 at Marki *Alonia* in Phases D, F, and H, indicating the spaces in which games were found. Plans from Frankel and Webb 2006a.

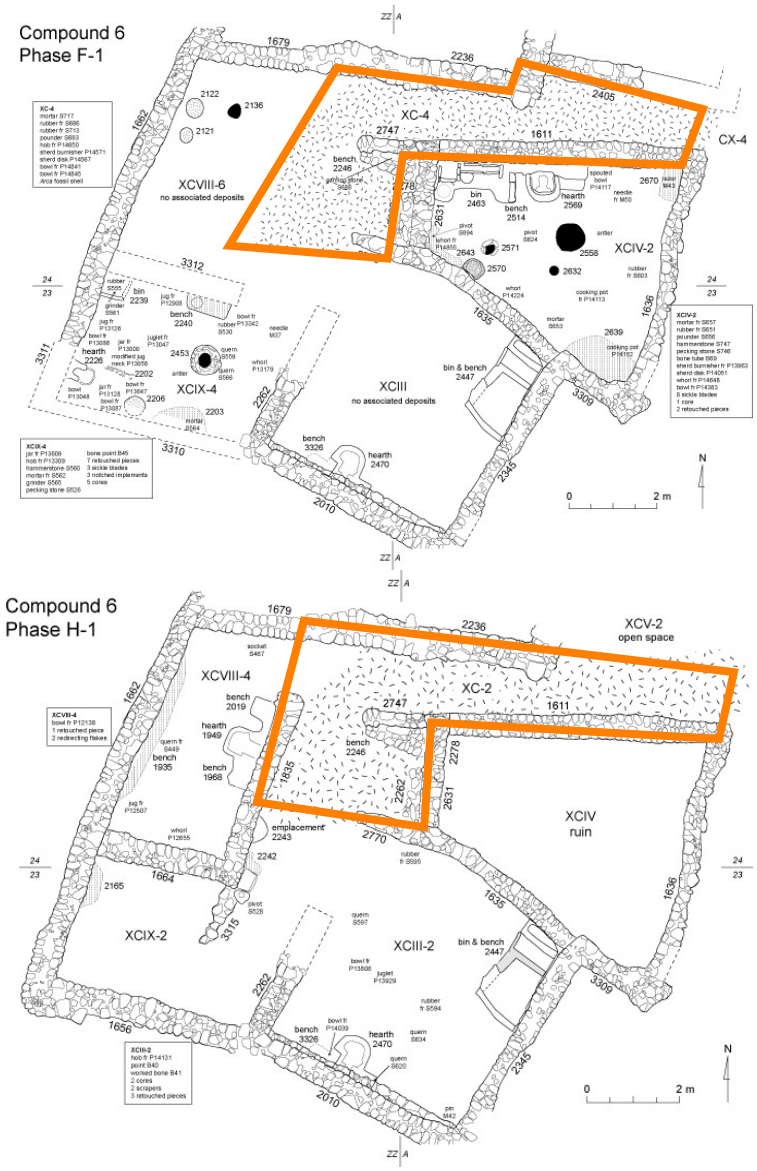


Figure VII.45: Plan of Compound 6 at Marki *Alonia* in Phases F and H, indicating spaces where games were found. Plans from Frankel and Webb 2006a.

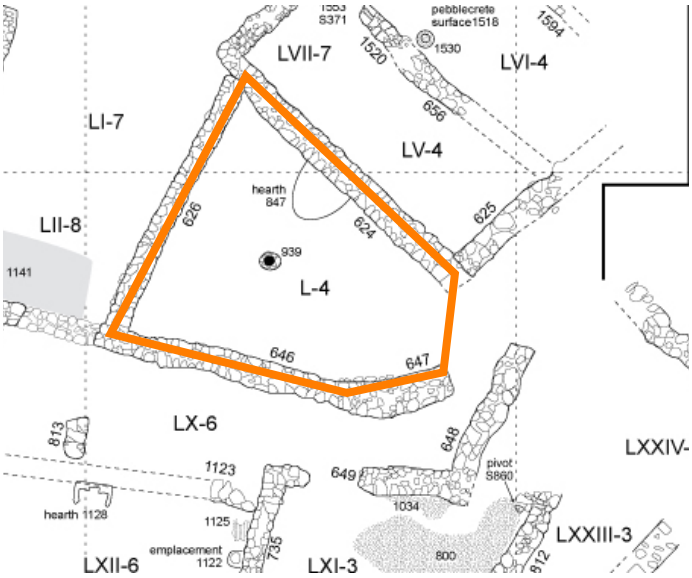


Figure VII.46: Plan of Compound 24 (Unit L), Phase F at Marki *Alonia*, where a single *mehen* game was found embedded into the floor. Plan from Frankel and Webb 2006a.



Figure VII.47: Plan of Compound 23, Phase H at Marki *Alonia* indicating Unit CXXI, where a *senet* game was found. Plan from Frankel and Webb 2006a.



Figure VII.48: Plan of Area A at Alambra *Mouttes* indicating Room 10 in Building III. Plan from Coleman *et al.*1996.



Figure VII.49: Plan of Area A at Episkopi *Phaneromeni* indicating spaces where games were found. Plan from Swiny 1986a.



Fig. VII.50. Plan of Morphou *Toumba tou Skourou* with detail of "Room with Benches in the earliest phase of the site. Findspot of *senet* game is indicated on the detail plan. Plans from Vermeule and Wolsky 1990.

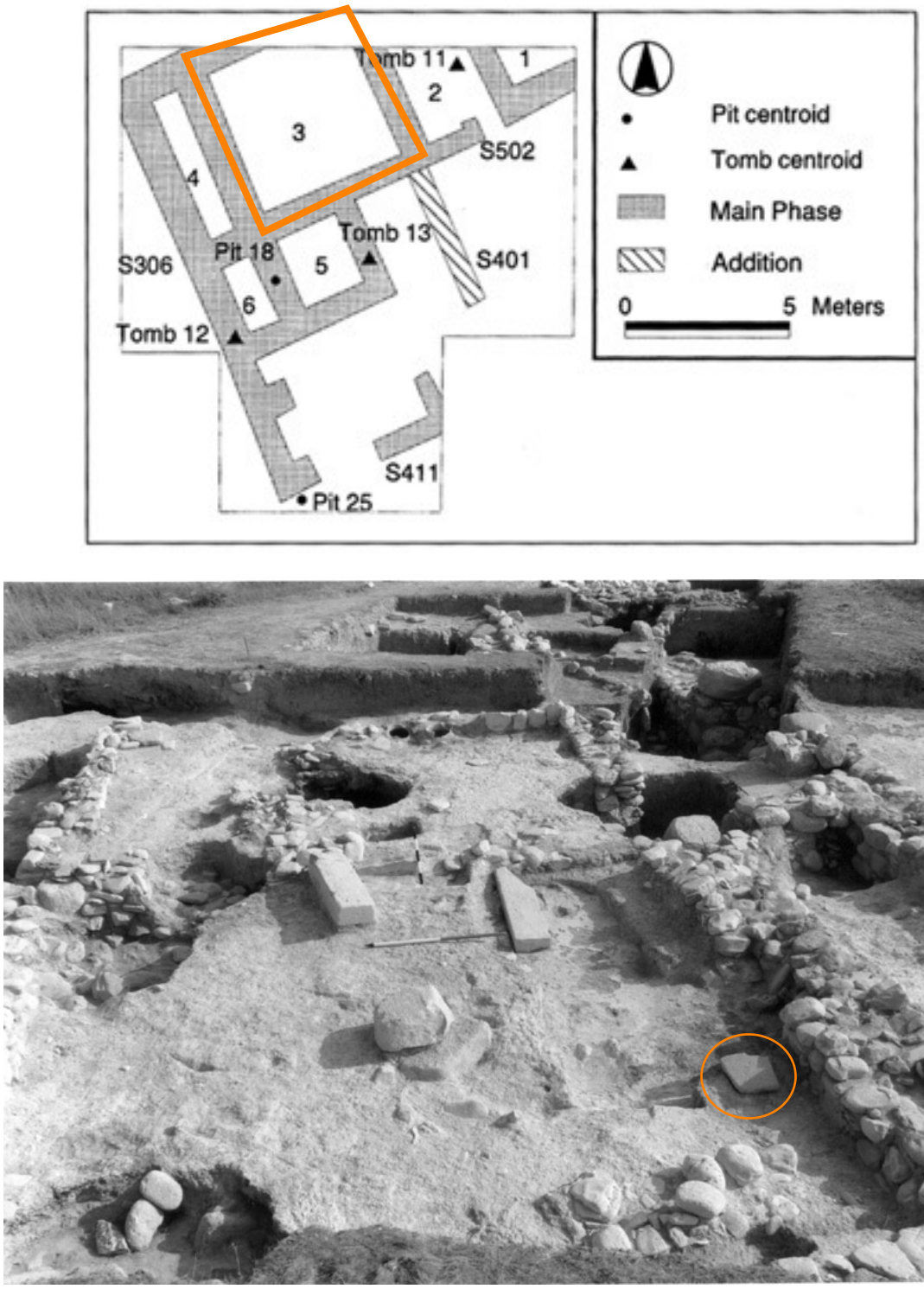


Figure VII.51: Plan Of Building 1 at Maroni *Tsaroukkas,* indicating Room 3 and a photograph of the 10-Ring game *in situ.* Photo courtesy of David Sewell, Plan from www.britishmuseum.org.

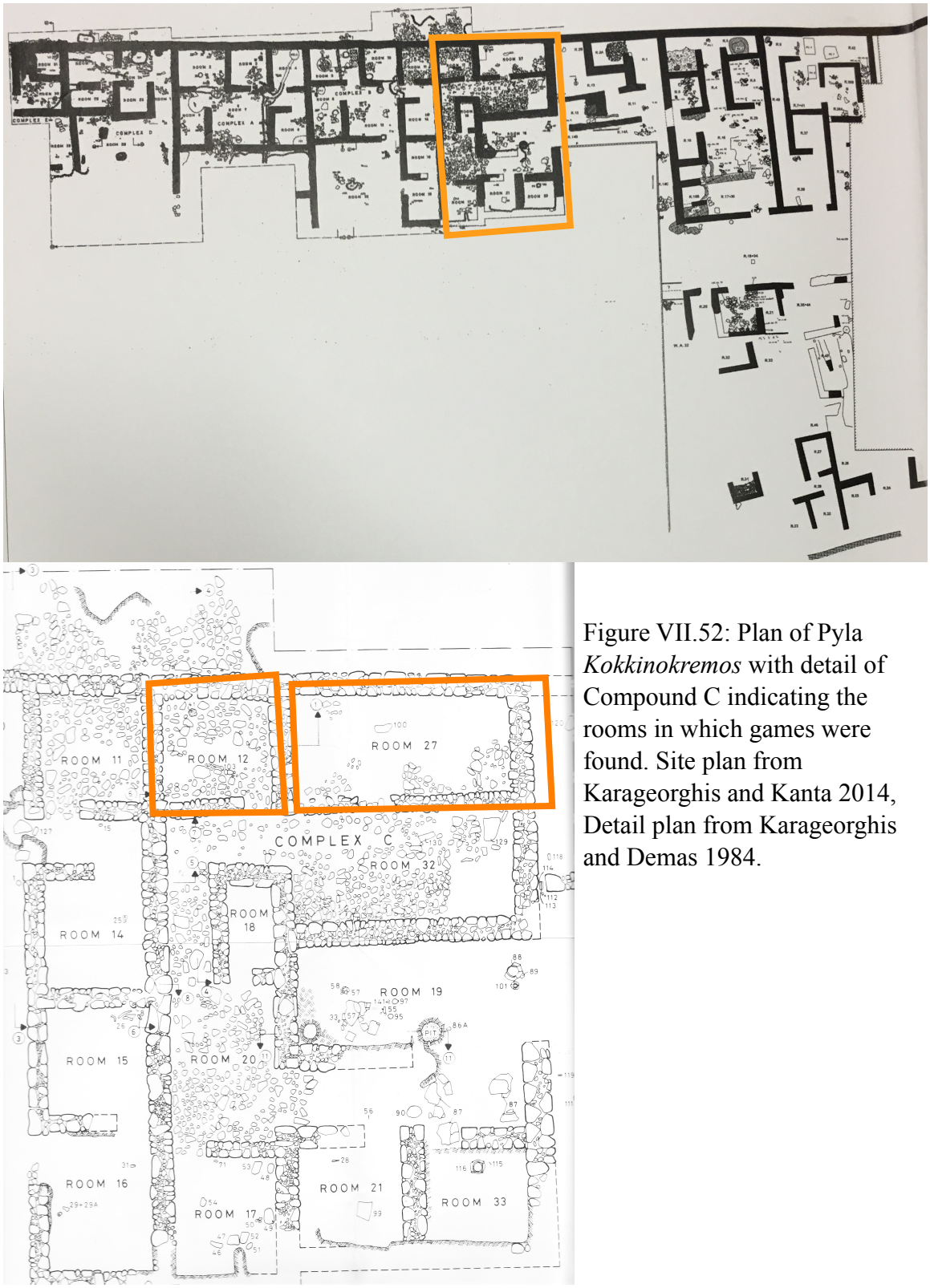


Figure VII.52: Plan of Pyla *Kokkinokremos* with detail of Compound C indicating the rooms in which games were found. Site plan from Karageorghis and Kanta 2014, Detail plan from Karageorghis and Demas 1984.

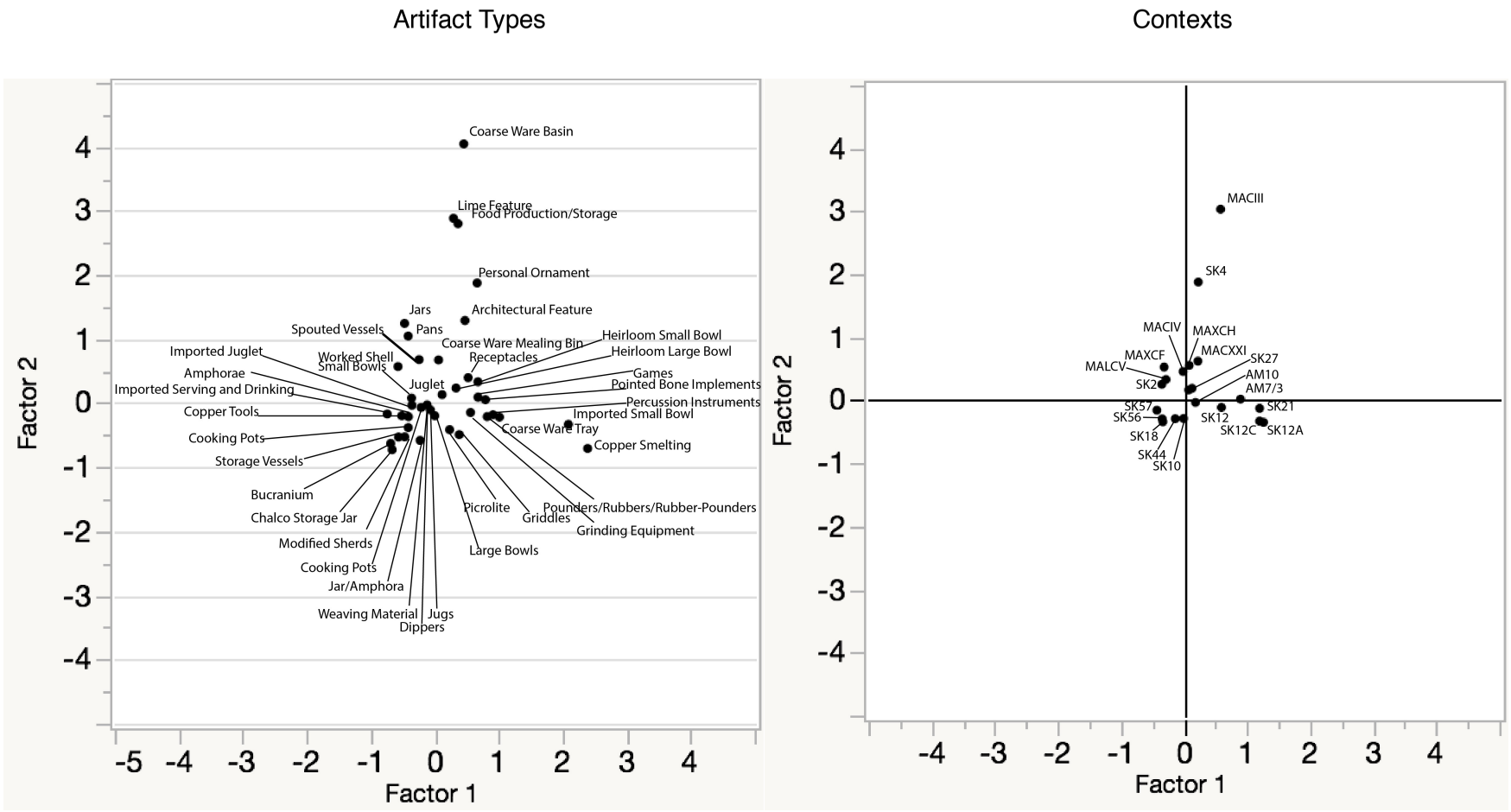


Figure.VII.53: Correspondence Analysis of PreBA Sites including all categories showing distribution with Food Production/Storage having outsized inertia.

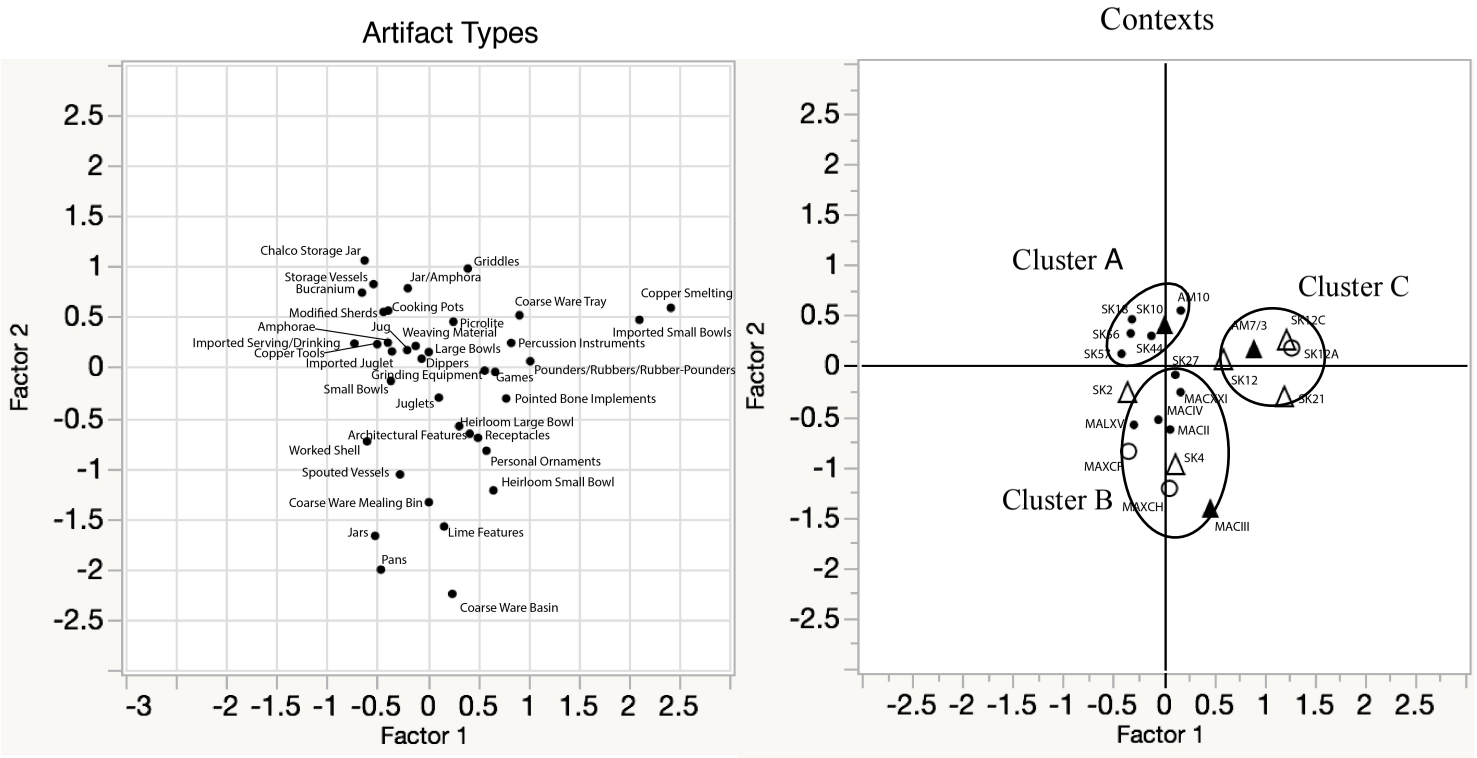


Figure VII.54: Correspondence Analysis of PreBA sites excluding food preparation/ storage category. Triangles = gaming spaces, circles = single games. Outlined points = open-aired spaces, closed points = roofed spaces.

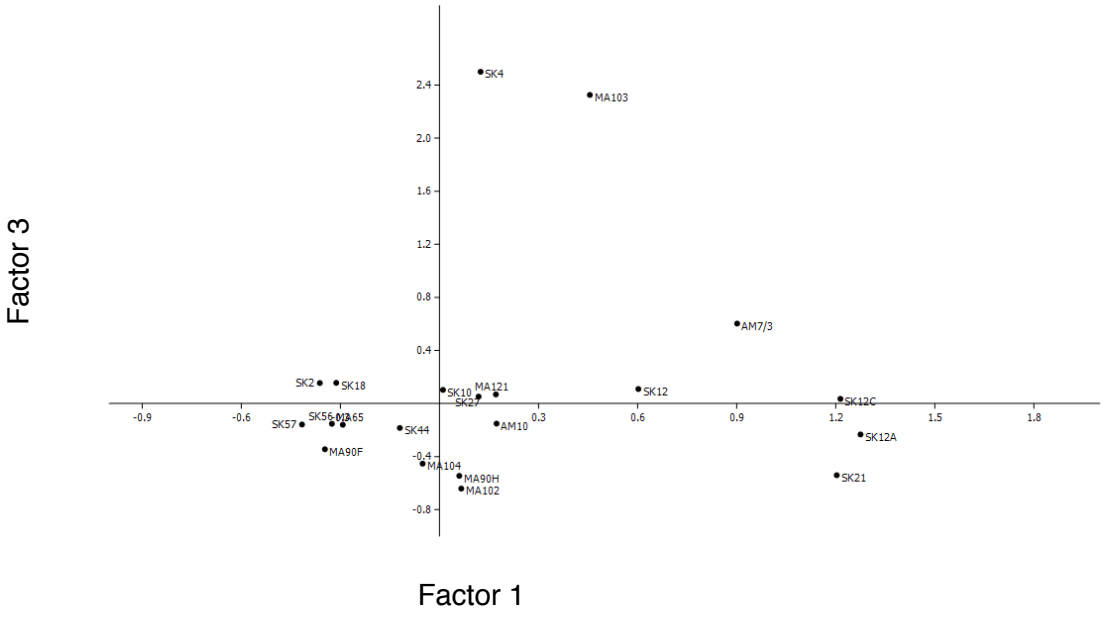


Figure VII.55: Correspondence Analysis of PreBA Sites showing factors 1 and 3.

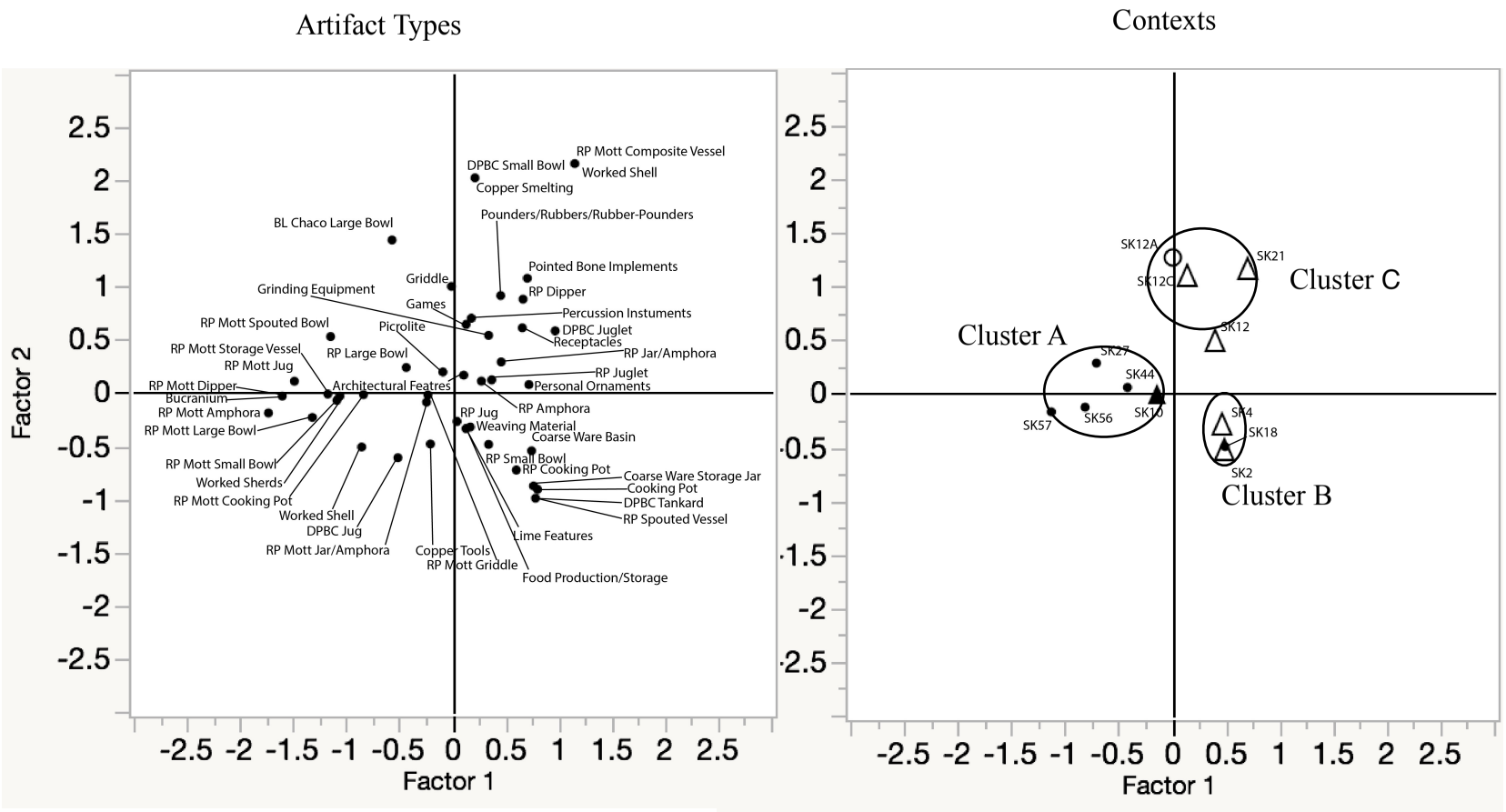


Figure VII.56: Correspondence Analysis of contexts fro mSotira *Kaminoudhia* Triangles = gaming spaces, circles = single games. Open points = open-aired spaces, closed points = roofed spaces.

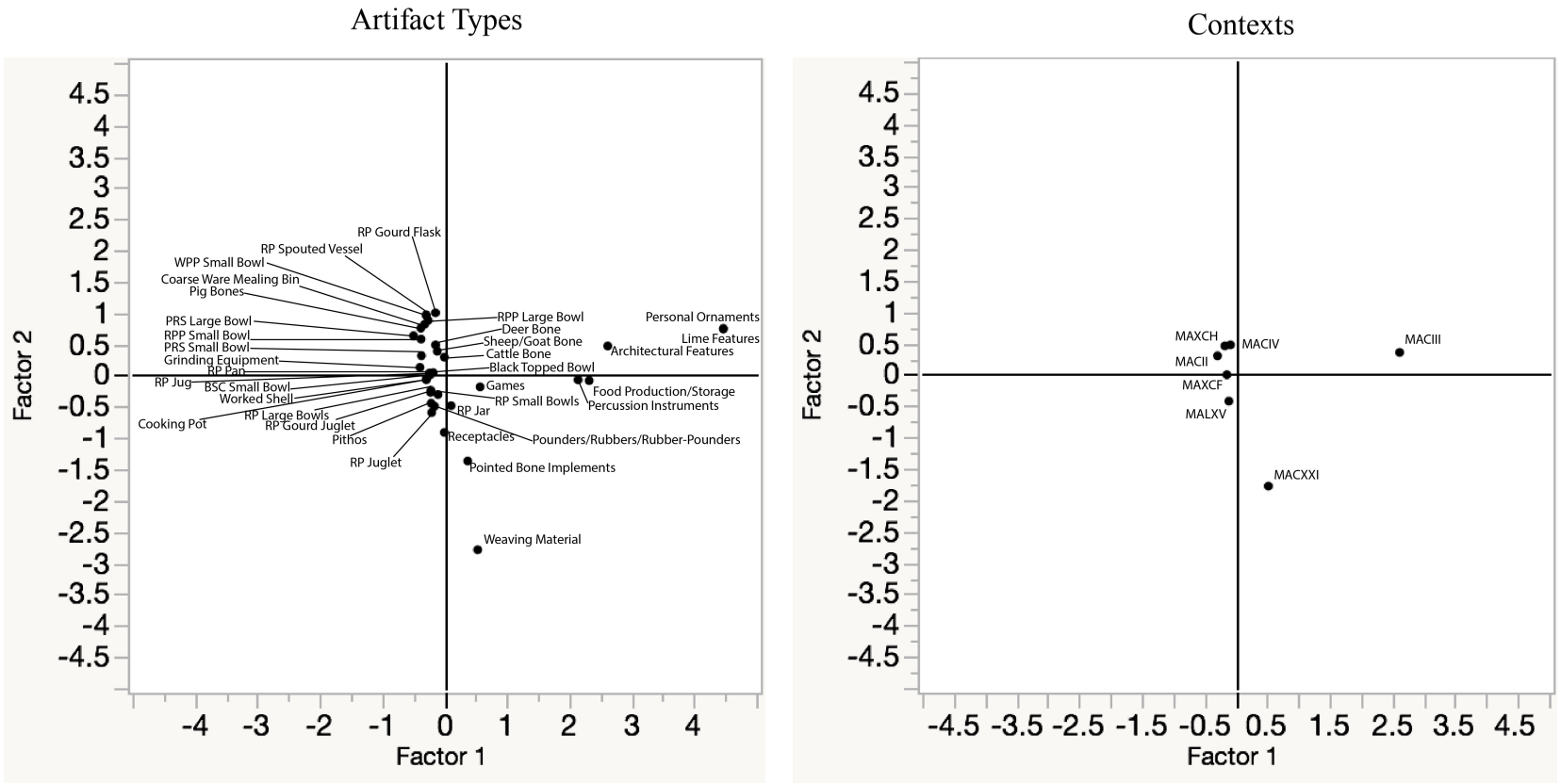


Figure VII.57: Correspondence Analysis of contexts at Marki *Alonia* including all artifact types

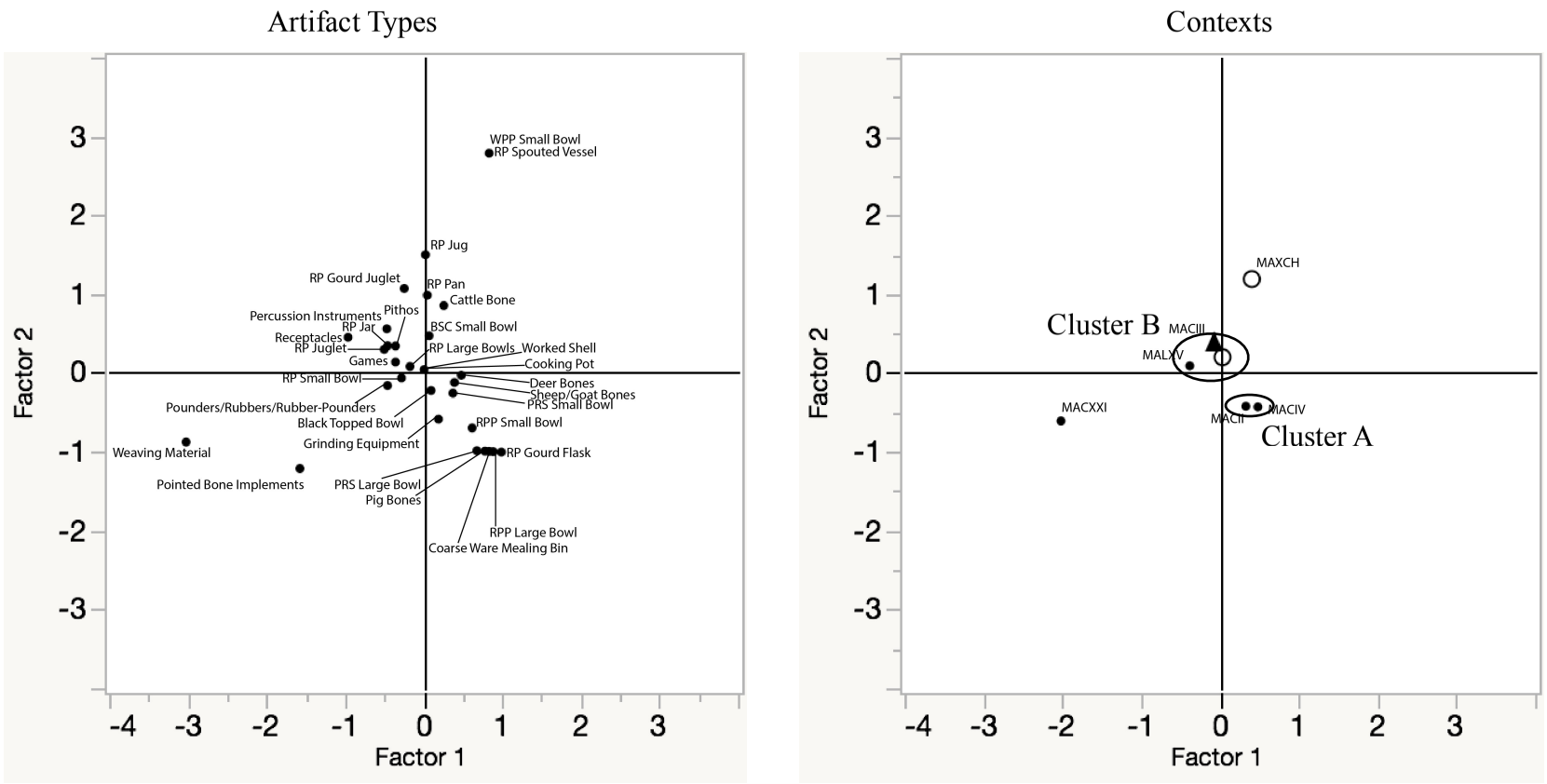


Figure VII.58: Correspondence Analysis of Marki *Alonia* excluding categories with outsized inertia. Triangles = gaming spaces, circles = single games. Open points = open-aired spaces, closed points = roofed spaces.

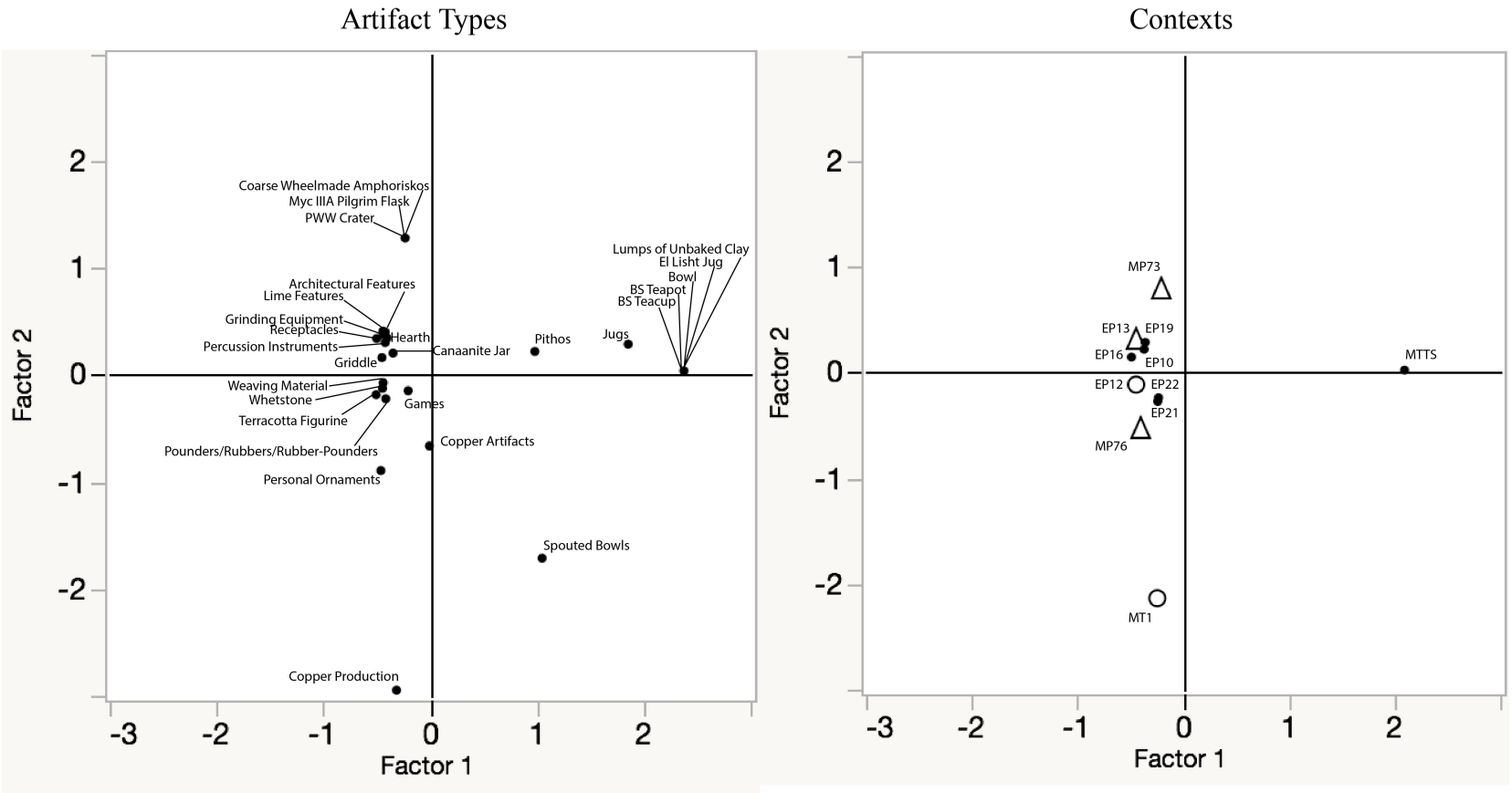


Figure VII.59: Correspondence Analysis of ProBA sites in Cyprus, showing coastal centers as outliers. Triangles = gaming spaces, circles = single games. Open points = open-aired spaces, closed points = roofed spaces.

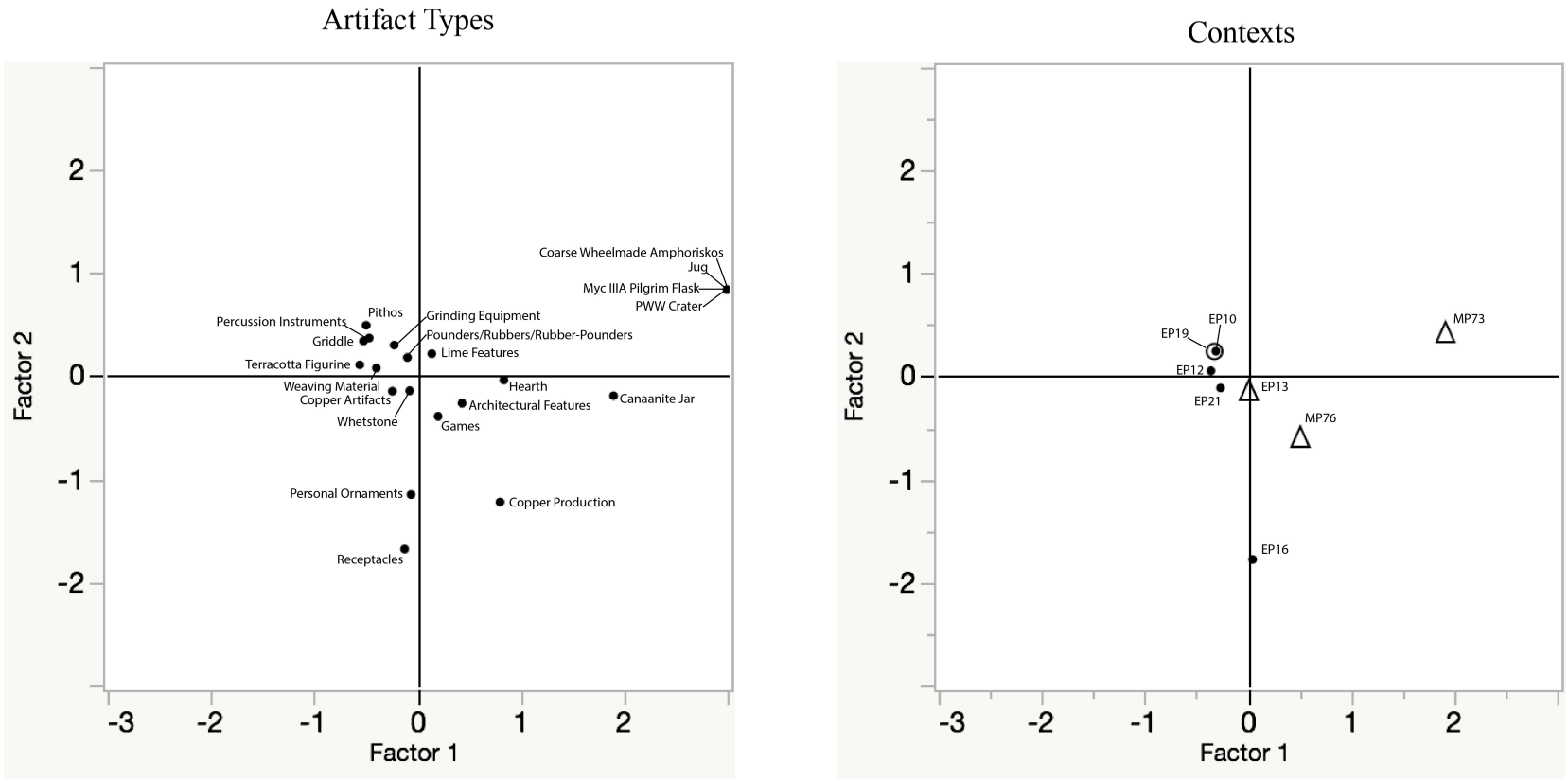


Figure VII.60: Correspondence Analysis of contexts from Episkopi *Phaneromeni* and Maa *Palaeokastro*. Triangles = gaming spaces, circles = single games. Open points = open-aired spaces, closed points = roofed spaces.

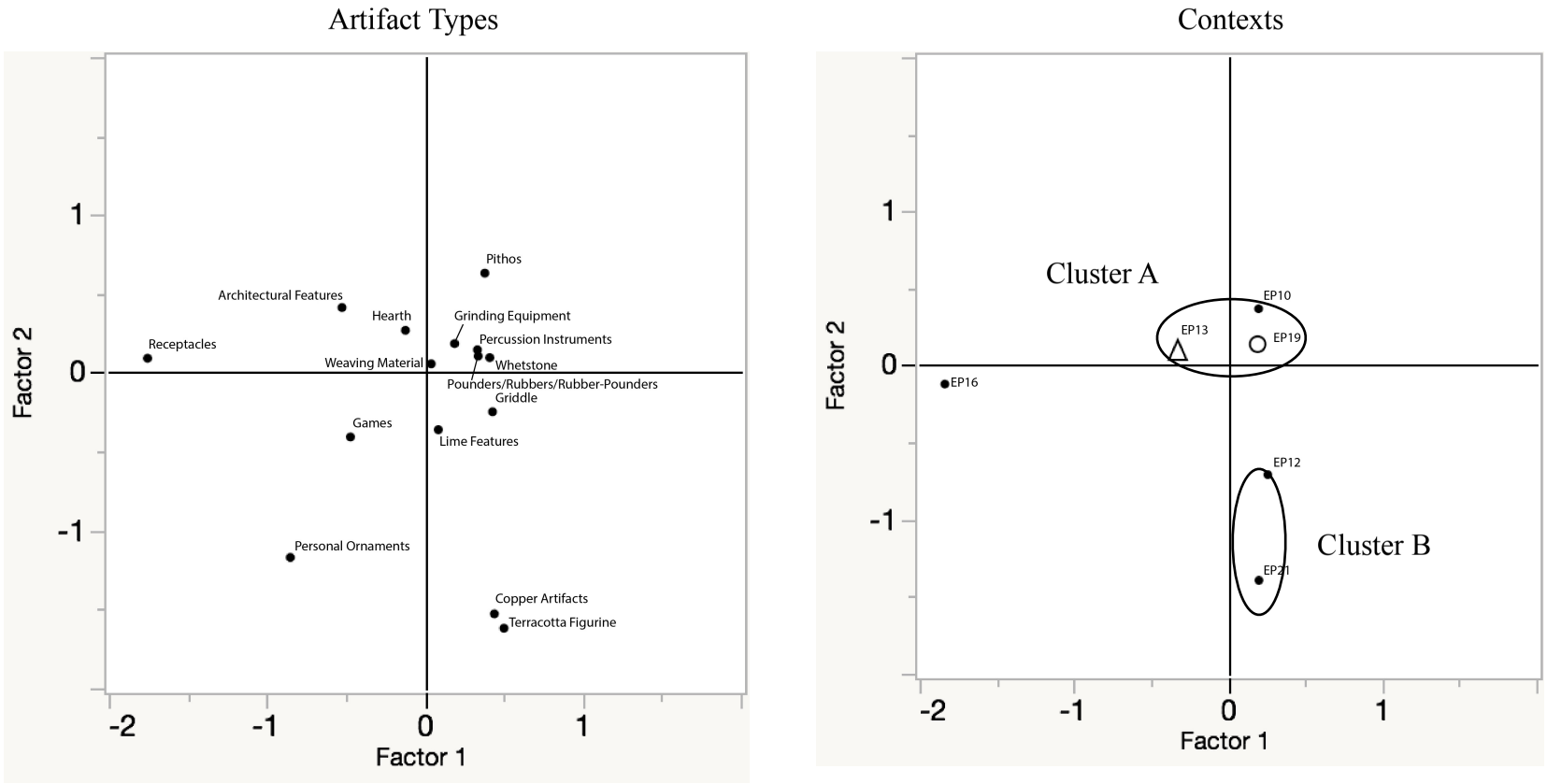


Figure VII.61: Correspondence Analysis of contexts from Episkopi *Phaneromeni*. Triangles = gaming spaces, circles = single games. Open points = open-aired spaces, closed points = roofed spaces.



Figure VIII.1: S18 from Marki *Alonia* showing a missing area where depressions once existed, either missing through wear or taphonomic processes.



Figure VIII.2: S412 from Episkopi *Phaneromeni* showing the rightmost row of depressions which have become indistinct from one another, potentially demonstrating use wear.

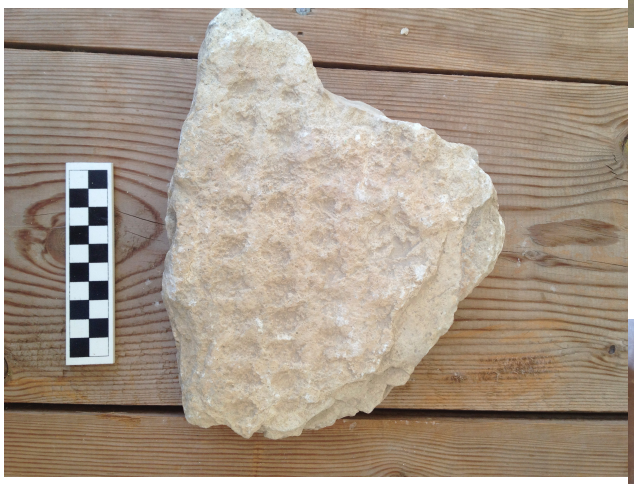


Figure VIII.3: S232 from Episkopi *Phaneromeni,* which may show incidental damage.



Figure VIII.4: S529 from Marki *Alonia,* which may show incidental damage.



Figure VIII.5: S167 from Sotira *Kaminoudhia* (left) and S160 from Marki *Alonia* (right) demonstrating breakage patterns that are likely intentional.

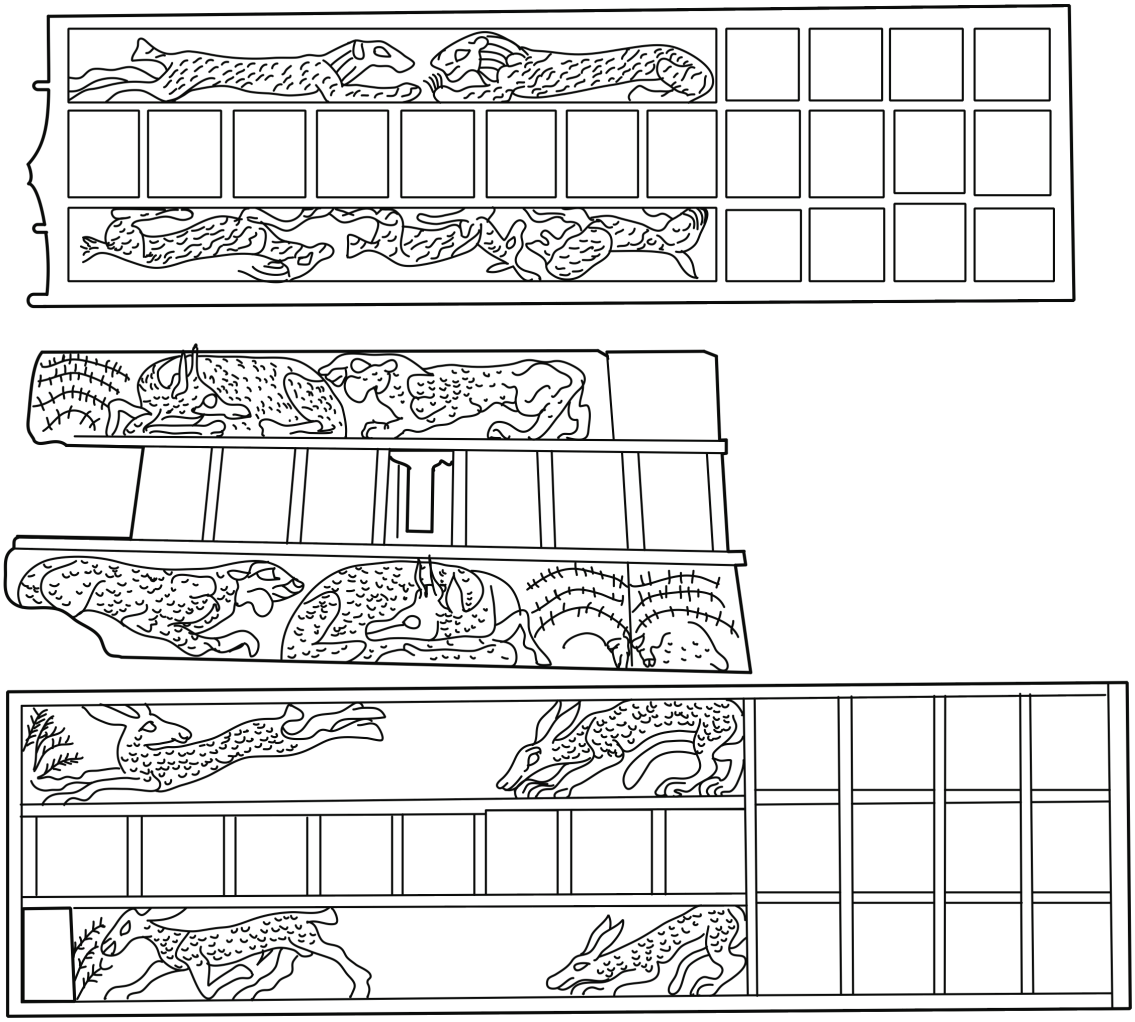


Figure VIII.6: Drawing of game boxes from el-Asasif, Egypt (top), Enkomi (center), and Kamid el-Loz (bottom), displaying similar motifs in the International Style. After Crist *et al.* 2016a: Fig. 5.

APPENDIX A

WEIGHT DATA OF GAMING STONES

Table A.1: Reconstructed weight of Bronze Age Cypriot Gaming Stones, sorted by increasing weight.

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Sotira Kaminoudhia	S953	0.28	26	87	0.32183908
Marki Alonia	404	0.2	13	43	0.465116279
Episkopi *Phaneromeni*	S238	0.33	17	57	0.578947368
Marki Alonia	456b	0.32	13	50	0.64
Kissonerga *Skalia*	KS 312	0.17	7	23	0.739130435
Marki Alonia	489	0.75	30	100	0.75
Sotira *Kaminoudhia*	S80	0.59	23	77	0.766233766
Marki Alonia	503	0.51	17	57	0.894736842
Sotira *Kaminoudhia*	S424	0.71	22	73	0.97260274
Episkopi *Phaneromeni*	S85	0.51	15	50	1.02
Sterakovou		0.44	13	43	1.023255814
Sotira *Kaminoudhia*	S475	0.7	19	63	1.111111111
Alambra Mouttes	B311 (AO. 392)	0.67	18	60	1.116666667
Episkopi *Phaneromeni*	S172a	0.46	11	37	1.243243243
Sotira *Kaminoudhia*	S120	0.84	19	63	1.333333333
Sotira Kaminoudhia	S748a	1.34	30	100	1.34
Episkopi *Bamboula*	11032	0.93	21	67	1.388059701
Marki Alonia	442	1.36	29	97	1.402061856
Maroni Vournes	326	1.42	30	100	1.42
Sotira *Kaminoudhia*	S610	0.81	17	57	1.421052632

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Maroni *Vournes*	17	0.62	17	43	1.441860465
Alambra *Mouttes*	B316 (AO. 498)	1.07	22	73	1.465753425
Sotira *Kaminoudhia*	S325	0.89	18	60	1.483333333
Episkopi *Phaneromeni*	S231	0.61	6	40	1.525
Sotira *Kaminoudhia*	S75	1.07	21	70	1.528571429
Alambra *Mouttes*	B315 (AS-80.22)	1.03	20	67	1.537313433
Alambra *Mouttes*	B313 (AO. 494)	1.57	30	100	1.57
Sotira *Kaminoudhia*	S1040	0.53	10	33	1.606060606
Sotira *Kaminoudhia*	S612	0.69	12	40	1.725
Sotira *Kaminoudhia*	S918	1.38	24	80	1.725
Sotira *Kaminoudhia*	S1064a	1.76	30	100	1.76
Anoyira *Peralijithias*	S6	0.94	16	53	1.773584906
Episkopi *Phaneromeni*	S464a	1.82	30	100	1.82
Marki *Alonia*	18	1.83	24	100	1.83
Episkopi *Bamboula*	58	0.81	13	43	1.88372093
Marki *Alonia*	417	1.83	29	97	1.886597938
Sotira *Kaminoudhia*	S330	1.93	30	100	1.93
Marki *Alonia*	613	0.85	13	43	1.976744186
Episkopi *Phaneromeni*	S464b	1.82	27	90	2.022222222
Marki Alonia	189	2.03	30	100	2.03
Episkopi *Bamboula*	130.EPBM. 050.002	0.61	9	30	2.033333333

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Sotira *Kaminoudhia*	S608	1.44	21	70	2.057142857
Sotira *Kaminoudhia*	S607	2.09	20	100	2.09
Kalavassos *Laroumena*	K-LAR 183	2.11	30	100	2.11
Marki *Alonia*	355	2.11	10	100	2.11
Kalavassos *Malouteri*	49-25	1.9	27	90	2.111111111
Episkopi *Phaneromeni*	S248	1.7	24	80	2.125
Maroni *Tsaroukkas*	MT.712	1.65	23	77	2.142857143
Marki *Alonia*	534	0.87	12	40	2.175
Sotira *Kaminoudhia*	S1039	1.69	2.3	77	2.194805195
Sotira *Kaminoudhia*	S888	2.2	30	100	2.2
Sotira *Kaminoudhia*	S958	1.26	17	57	2.210526316
Episkopi *Bamboula*	17	1.77	24	80	2.2125
Episkopi *Phaneromeni*	S403	2.24	30	100	2.24
Kalavassos *Arkhangelos*	8-90	1.6	21	70	2.285714286
Episkopi *Phaneromeni*	S479	1.9	25	83	2.289156627
Episkopi *Phaneromeni*	S232	2.1	27	90	2.333333333
Marki *Alonia*	520	2.36	30	100	2.36
Maroni *Vournes*	5	2.36	40	100	2.36
Alambra *Mouttes*	B317 (AO. 499)a	2.08	26	87	2.390804598
Maa *Palaeokastro*	682b	1.22	12	50	2.44
Maa *Palaeokastro*	682a	1.22	17	50	2.44

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Maroni *Vournes*	307	1.35	16	53	2.547169811
Sotira *Kaminoudhia*	S234	2.23	26	87	2.563218391
Sotira *Kaminoudhia*	S606	1.29	15	50	2.58
Marki Alonia	38	2.67	30	100	2.67
Sotira Kaminoudhia	S748b	1.34	11	50	2.68
Sotira *Kaminoudhia*	S161	1.28	14	47	2.723404255
Sotira Kaminoudhia	S1018	0.9	10	33	2.727272727
Sotira Kaminoudhia	S730	2.78	30	100	2.78
Episkopi *Bamboula*	10416	2.79	10	100	2.79
Sotira Kaminoudhia	S859a	2.79	30	100	2.79
Anoyira *Peralijithias*	S14	2.81	30	100	2.81
Sotira *Kaminoudhia*	S611	1.91	20	67	2.850746269
Marki Alonia	416	2.1	22	73	2.876712329
Episkopi *Phaneromeni*	S436	1.64	17	57	2.877192982
Sotira *Kaminoudhia*	S235	2.91	30	100	2.91
Sotira *Kaminoudhia*	S633	1.47	15	50	2.94
Sotira Kaminoudhia	S1041	2.78	28	93	2.989247312
Sotira Kaminoudhia	S851	3	30	100	3
Tokhni *Oriti North*	132-1	2.94	49	98	3
Sotira *Kaminoudhia*	S533	1.22	12	40	3.05
Marki Alonia	119	1.32	13	43	3.069767442

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Marki Alonia	S211	2.27	24	73	3.109589041
Marki Alonia	287	2.95	28	93	3.172043011
Marki Alonia	22	2.23	21	70	3.185714286
Sotira *Kaminoudhia*	S77	2.01	19	63	3.19047619
Sotira Kaminoudhia	S887	1.2	11	37	3.243243243
Episkopi *Phaneromeni*	S319	1.72	16	53	3.245283019
Sotira Kaminoudhia	S727	2.63	22	80	3.2875
Marki Alonia	160	1.65	15	50	3.3
Sotira *Kaminoudhia*	S425	3.32	28	100	3.32
Marki Kappara	AS6	3.32	30	100	3.32
Episkopi *Phaneromeni*	S441	1.11	10	33	3.363636364
Episkopi Bamboula	10412	3.15	27	90	3.5
Sotira *Kaminoudhia*	S532	2.01	17	57	3.526315789
Evdhimou *Beyouk Tarla*	S57	3.53	36	100	3.53
Episkopi *Phaneromeni*	S172b	0.46	4	13	3.538461538
Anoyira *Peralijithias*	S13	1.18	10	33	3.575757576
Evdhimou *Beyouk Tarla*	SY-EBT S35	3.6	30	100	3.6
Sotira *Kaminoudhia*	S167	1.91	16	53	3.603773585
Sotira Kaminoudhia	S859b	2.79	23	77	3.623376623
Marki Alonia	178b	3.64	30	100	3.64
Alambra Mouttes	B312 (AO. 410)	2.31	19	63	3.666666667

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Evdhimou *Stympouli*	Stym S6	2.46	20	67	3.671641791
Bellapais *Vounous*		1.97	16	53	3.716981132
Marki Alonia	46	1.99	16	53	3.754716981
Marki Alonia	232	3.15	25	83	3.795180723
Sotira *Kaminoudhia*	S78	3.82	30	100	3.82
Episkopi *Phaneromeni*	S466	3.86	30	100	3.86
Evdhimou *Beyouk Tarla*	S39	2.46	19	63	3.904761905
Alambra Mouttes	B314 (A31-82.1)	1.84	14	47	3.914893617
Sotira *Kaminoudhia*	S168	2.09	16	53	3.943396226
Maroni Vournes	325	3.95	30	100	3.95
Sotira *Kaminoudhia*	S72	3.96	28	100	3.96
Kissonerga *Skalia*	G234	3.46	26	87	3.977011494
Evdhimou *Beyouk Tarla*	SY-EBT S34	3.2	24	80	4
Marki Alonia	819	4	30	100	4
MARONI	833.IV U.S.	3.91	29	97	4.030927835
Marki Alonia	425	2.72	20	67	4.059701493
Kalavassos *Malouteri*	49-26	2.45	18	60	4.083333333
Sotira *Kaminoudhia*	S102	0.71	5	17	4.176470588
Sotira *Kaminoudhia*	S1084b	1.98	14	47	4.212765957
Sotira Kaminoudhia	S957	4.22	30	100	4.22
Kalavasos *Ayios Dhimitrios*	K-AD 122	4.12	29	97	4.24742268

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Episkopi *Phaneromeni*	S137	4.25	26	100	4.25
Sotira *Kaminoudhia*	S114	2.55	18	60	4.25
Marki Alonia	174	4.26	30	100	4.26
Sotira Kaminoudhia	S1085	1.58	11	37	4.27027027
Pyla *Kokkinokremos*	100	4.15	29	97	4.278350515
Episkopi *Phaneromeni*	S194	3.84	26	87	4.413793103
Sotira *Kaminoudhia*	S281	2.36	16	53	4.452830189
Evdhimou *Beyouk Tarla*	S 37	4.52	8	100	4.52
Sotira *Kaminoudhia*	S609	3.63	24	80	4.5375
Marki Alonia	178a	3.64	24	80	4.55
Marki Alonia	47	2.91	19	63	4.619047619
Kition *Kathari*	4808	4.65	27	100	4.65
Anoyira *Peralijithias*	S20	4.67	30	100	4.67
Episkopi *Phaneromeni*	S412a	4.67	30	100	4.67
Sotira *Kaminoudhia*	S109	1.74	11	37	4.702702703
Sotira *Kaminoudhia*	S467	4.73	30	100	4.73
Maa *Palaeokastro*	369	4.77	28	100	4.77
Episkopi *Phaneromeni*	S412b	4.67	29	97	4.81443299
Sotira Kaminoudhia	S942	4.87	42	100	4.87
Marki Alonia	529	4.97	30	100	4.97
Episkopi *Bamboula*	19	0.3	2	6	5

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Marion		5.11	30	100	5.11
Episkopi *Phaneromeni*	S244	5.16	30	100	5.16
Episkopi Phaneromeni		5.17	30	100	5.17
Evdhimou *Beyouk Tarla*	SY-EBT S36	5.28	30	100	5.28
Episkopi *Phaneromeni*	S402	5.32	30	100	5.32
Anoyira *Peralijithias*	S10b	5.36	30	100	5.36
Episkopi *Phaneromeni*	S21	5.39	30	100	5.39
Marki Alonia	99	2.02	11	37	5.459459459
Marki Alonia	516	3.36	18	60	5.6
Sotira *Kaminoudhia*	S546	5.63	30	100	5.63
Kition *Kathari*	5499	5.66	30	100	5.66
Anoyira *Peralijithias*	S21	5.78	30	100	5.78
Anoyira *Peralijithias*	S10a	5.36	27	90	5.955555556
Kissonerga *Skalia*	G1	2.62	13	43	6.093023256
Marki Alonia	220	4.14	26	67	6.179104478
Sotira *Kaminoudhia*	S613a	6.24	40	100	6.24
Marki Alonia	168	2.07	10	33	6.272727273
Anoyira *Livadhia*	S20	1.9	9	30	6.333333333
Marki Alonia	144a	5.11	24	80	6.3875
Episkopi Phaneromeni	CHM-RR326	6.49	42	100	6.49
Sotira Kaminoudhia	S1011	6.67	23	100	6.67
Kissonerga *Skalia*	G545	5.38	24	80	6.725

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Marki Alonia	456a	3.51	15	50	7.02
Episkopi *Phaneromeni*	S193	7.14	15	100	7.14
Evdhimou *Beyouk Tarla*	S29	3.84	16	53	7.245283019
Sotira *Kaminoudhia*	S1084a	1.98	8	27	7.333333333
Marki Alonia	521	6.2	25	83	7.469879518
Episkopi *Phaneromeni*	S233	2.47	10	33	7.484848485
Sotira *Kaminoudhia*	S613b	6.24	25	83	7.518072289
Anoyira *Livadhia*	S21	2.27	30	100	7.566666667
Episkopi *Phaneromeni*	S279	7.14	28	93	7.677419355
Marki Alonia	688	6.8	26	87	7.816091954
Sotira *Kaminoudhia*	S71	2.4	9	30	8
Episkopi *Phaneromeni*	S416b	8.12	30	100	8.12
Episkopi *Phaneromeni*	S179	2.68	10	33	8.121212121
Maroni *Vournes*	33	7.88	37	93	8.47311828
Anoyira *Livadhia*	S22	6.82	24	80	8.525
Episkopi *Phaneromeni*	S392	8.66	10	100	8.66
Maroni *Tsaroukkas*	MT.688	8.51	29	97	8.773195876
Maroni Vournes	328	7.07	32	80	8.8375
Marki Alonia	768	8.91	30	100	8.91
Episkopi *Phaneromeni*	S416a	8.12	27	90	9.022222222
Sotira Kaminoudhia	S991	10.03	30	100	10.03

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Episkopi *Phaneromeni*	S136	10.1	30	100	10.1
Episkopi *Phaneromeni*	S19	10.31	30	100	10.31
Alambra Mouttes	B317 (AO. 499)b	2.08	7	20	10.4
Marki Alonia	61	7.105	20	67	10.60447761
Episkopi *Phaneromeni*	S413	10.82	30	100	10.82
Marki Alonia	457	11	47	100	11
Marki Alonia	48	11.25	30	100	11.25
Episkopi Phaneromeni	S138	11.16	27	90	12.4
Marki Alonia	144b	5.11	12	40	12.775
Hala Sultan Tekke	N1401	13.66	30	100	13.66
Maroni Vournes	323	13.82	30	100	13.82
Marki Alonia	13	14.93	46	100	14.93
Episkopi Phaneromeni	CHM-RR 325	15.44	50	100	15.44
Episkopi *Phaneromeni*	S280	14.84	16	93	15.95698925
Episkopi *Phaneromeni*	S477	17.26	30	100	17.26
Sotira *Kaminoudhia*	S163	10.53	17	57	18.47368421
Sotira Kaminoudhia	S1086	18.48	28	93	19.87096774
Alambra *Mouttes*	B310 (AO 266)	21.53	29	100	21.53
Marki Alonia	830	26.5	30	100	26.5
Marki Alonia	150	20.2	39	75	26.93333333
Episkopi *Phaneromeni*	S84	28.2	42	100	28.2
Episkopi *Phaneromeni*	CHM-RR 328	35.5	7	100	35.5

Site	Number	Weight	Number of Depressions	% preserved	Reconstructed Weight
Maroni *Tsaroukkas*	MT.188	39.51	24	95	41.58947368
Episkopi *Phaneromeni*	CHM-RR 329	>40	87	100	>40

APPENDIX B

CONTEXTUAL DATA

Table B.1: Raw tabulation of artifacts found in the same space as games at PreBA sites.

Unit	Games	Hearth	Platf-orm	Pebbl-ecrete Empl-acemen t	Benc h	Thres-hold	Post Supp-ort	Socle Stone	Plaster Mortar	Bench	Lime bins	Lime Plaster
AM 7/3	1	0	0	0	0	1	0	0	0	0	0	0
AM10	1	1	1	0	0	0	0	0	0	0	0	0
MAL XV	1	0	0	0	0	0	0	0	0	0	0	0
MACI I	1	0	0	0	0	0	0	0	0	0	0	0
MAX CH	1	0	0	0	0	0	0	0	0	0	0	0
MAX CF	1	0	0	0	0	0	0	0	0	0	0	0
MAC XXI	1	0	0	0	0	0	0	0	0	0	0	0
MACI V	1		0	0	0	0	0	0	0	0	0	0
MACI II	1	1	0	0	1	0	2	0	0	1	1	0
SK10	6	0	0	0	0	0	0	0	0	0	0	0
SK27	1	1	0	0	2	0	0	0	1	2	0	0
SK12	8	0	0	0	0	0	0	0	0	0	0	0
SK4	1	1	0	0	0	0	0	0	0	0	0	1
SK18	1	0	0	0	1	0	0	0	0	1	0	0
SK21	2	0	0	0	0	0	0	0	0	0	0	0
SK2	2	1	0	0	3	1	0	0	0	3	0	1
SK12 C	5	0	0	0	2	0	0	0	0	2	0	0
SK44	3	0	0	0	0	0	0	0	0	0	0	0
SK57	1	0	0	0	0	0	0	0	0	0	0	0
SK12 A	1	0	0	0	0	0	0	0	0	0	0	0
SK56	1	0	0	0	0	0	0	0	0	0	0	0

Unit	Hob	Altar	Pounder	Rubber-Pounder	Rubbing Stone	Quern	Rubber	Work Surface	Pestle	Chopping Stone	Adze	Picrolite
AM 7/3	0	0	1	0	0	0	0	0	0	0	0	0
AM10	0	0	0	0	0	1	0	0	0	0	0	0
MAL XV	0	0	0	0	1	0	5	0	0	0	0	0
MAC II	0	0	0	0	0	3	2	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	0	0	0	0
MAX CF	0	0	1	0	0	0	2	0	0	0	0	0
MAC XXI	0	0	1	0	0	0	0	0	0	0	0	0
MAC IV	1	0	1	0	0	0	0	0	0	0	0	0
MAC III	1	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	4	0	4	0	0	0	0	0	0	0
SK27	0	0	4	1	1	3	0	0	0	0	0	1
SK12	0	0	17	4	0	2	4	0	0	0	1	0
SK4	0	0	1	0	0	0	0	0	0	0	0	0
SK18	0	0	10	1	0	3	4	0	2	0	0	5
SK21	0	0	7	1	1	4	5	2	0	0	0	1
SK2	0	0	3	1	2	1	3	0	0	0	0	2
SK12C	0	0	23	2	0	3	1	0	0	0	1	0
SK44	0	0	1	0	0	0	0	0	0	1	0	0
SK57	0	0	1	0	0	0	0	0	0	0	0	0
SK12A	0	0	1	2	0	0	1	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Mort-ar	Stone Basin	Ham-merst-one	Pecki-ng Stone	Whet-stone	Stone Axe	Burni-sher	Perfo-rated ham-mer	Chalc-edony Flake	Stone Weig-ht	Jar Cover	Perfo-rated Disk
AM 7/3	0	0	0	0	0	1	0	0	0	0	0	0
AM10	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	2	0	1	0	0	0	0	0	0	1	0	0
MAC II	0	0	0	0	0	0	0	0	0	0	0	0
MAX CH	1	0	0	0	0	0	0	0	0	0	0	0
MAX CF	1	0	0	0	0	0	0	0	0	0	0	0
MAC XXI	1	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	0	0	0	0	0	0	0	0
MAC III	0	0	1	0	0	0	0	0	0	0	0	0
SK10	0	0	1	3	0	0	0	0	0	3	0	0
SK27	0	0	0	1	0	0	0	0	0	0	0	0
SK12	1	0	2	1	1	1	0	0	0	1	0	0
SK4	1	0	0	0	0	0	0	0	0	0	0	0
SK18	0	0	1	1	1	2	0	0	0	2	1	0
SK21	3	0	3	1	0	0	0	0	0	0	0	0
SK2	1	0	0	0	0	1	0	0	0	2	1	1
SK12 C	0	0	2	1	0	0	0	1	1	0	2	0
SK44	0	0	1	1	0	2	0	0	0	0	0	0
SK57	1	0	0	0	1	0	0	0	0	0	0	0
SK12 A	0	0	0	1	1	1	0	0	0	0	0	0
SK56	0	0	1	0	0	0	0	0	0	0	0	0

Unit	Mace head	Tethe-ring Stone	Stone w/ Depr-ession	Grind-er	Chlor-ite Bead	Pivot	Mill	Stone Bowl	Trou-gh	Lime-stone Platter	Grind-ing Surfac e	conce-ntrati-on of igneo-us pebbl-es
AM 7/3	1	0	0	0	0	0	0	0	0	0	0	0
AM1 0	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	0	0	0	1	0	1	1	0	0	0	0	0
MAC II	0	0	0	1	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	0	0	0	0
MAX CF	0	0	0	0	0	0	0	0	0	0	0	0
MAC XXI	0	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	0	1	0	0	0	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	0	0	0	0	0	0	0	0	0	0
SK27	0	0	0	0	0	0	0	0	0	0	0	0
SK12	0	1	0	0	0	0	0	0	1	0	0	1
SK4	0	0	0	0	0	0	0	0	0	0	0	0
SK18	0	0	0	0	0	0	0	0	1	1	0	0
SK21	0	0	0	0	0	0	0	1	0	0	0	0
SK2	0	0	1	0	0	0	0	0	0	0	0	0
SK12 C	0	0	0	0	0	0	0	0	0	0	0	0
SK44	0	0	0	0	0	0	0	0	0	0	1	0
SK57	0	0	1	0	0	0	0	0	0	0	0	0
SK12 A	0	0	0	0	0	0	0	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Worked Picrolite	Picrolite Pendant	Unworked Picrolite	Picrolite Debitage	Bead	Loom weight	Hob	TC Figurine	Spindle Whorl	Roundel	Tripod Foot	TC Bead
AM 7/3	0	0	0	0	0	0	0	1	1	0	0	0
AM10	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	0	0	0	0	0	0	0	0	0	1	0	0
MAC II	0	0	0	0	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	1	0	0	0	0
MAX CF	0	0	0	0	0	0	1	0	0	1	0	0
MAC XXI	0	0	0	0	0	0	1	0	2	0	0	0
MAC IV	0	0	0	0	0	0	0	0	0	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	2	1	0	0	0	3	0	0	2	0	0	0
SK27	0	0	1	0	0	0	0	0	0	0	0	0
SK12	3	2	1	1	2	1	0	0	0	0	0	0
SK4	0	0	0	0	0	0	0	0	1	1	0	0
SK18	1	1	0	3	1	1	0	0	3	0	0	0
SK21	0	0	0	0	0	0	0	1	1	0	0	0
SK2	0	0	0	0	0	0	0	0	4	2	0	0
SK12C	1	0	2	2	0	0	0	0	0	0	0	0
SK44	0	1	0	0	0	0	0	0	1	0	0	0
SK57	0	3	6	0	0	0	0	0	3	5	0	0
SK12A	0	0	0	1	0	0	0	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0	0	0	0

Unit	TC button / Toggle	Sherd Burnisher	Unbaked Clay reel	Lumps of unbaked clay	Copper Awl	Copper Needle	Arsenical Copper Chisel	Cooper pin	Sheet Copper	Copper Lump	Copper Slag	Casting Waste
AM 7/3	0	0	0	0	0	0	0	0	0	0	0	0
AM10	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	0	0	0	0	0	0	0	0	0	0	0	0
MAC II	0	1	0	0	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	0	0	0	0
MAX CF	0	1	0	0	0	0	0	0	0	0	0	0
MAC XXI	0	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	0	0	0	0	0	0	0	0
MAC III	1	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	0	0	0	0	0	0	0	0	0	0
SK27	0	0	0	0	0	0	0	0	0	0	0	0
SK12	0	0	0	0	0	0	1	0	1	0	0	0
SK4	0	0	0	0	0	0	0	0	0	0	0	0
SK18	0	0	0	0	0	1	0	1	0	0	0	0
SK21	0	0	0	0	0	0	0	0	0	0	0	0
SK2	0	0	0	0	2	0	0	0	0	0	0	0
SK12 C	0	0	0	0	0	0	0	0	0	0	1	0
SK44	0	0	0	0	0	0	0	0	0	0	0	0
SK57	0	0	0	0	0	2	0	0	0	0	0	0
SK12 A	0	0	0	0	0	0	0	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Bron-ze Need-le	Nail	Metal Core	Bone Need-le	Bone Point	Bone Awl	Bone Bead	Antler Tool	Bucr-anium	Cattle Scap-u-la	BL (Chal-co) Large Bowl	Chal-co Store Vess-el
AM 7/3	0	0	0	0	0	0	0	0	0	0	0	0
AM10	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	0	0	0	0	0	0	0	0	0	0	0	0
MAC II	0	0	0	0	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	0	0	0	0
MAX CF	0	0	0	0	0	0	0	0	0	0	0	0
MAC XXI	0	0	0	0	1	0	0	0	0	0	0	0
MAC IV	0	0	0	1	0	0	0	0	0	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	0	0	0	0	0	0	0	0	0	0
SK27	0	0	0	0	0	0	0	0	0	0	1	0
SK12	0	0	0	1	0	0	0	0	0	0	0	0
SK4	0	0	0	0	0	0	1	0	0	0	0	0
SK18	0	0	0	0	0	0	0	1	0	0	1	4
SK21	0	0	0	0	3	0	0	0	0	0	0	0
SK2	0	0	0	1	0	0	0	0	0	0	0	0
SK12 C	0	0	0	0	0	0	0	0	0	1	0	0
SK44	0	0	0	0	0	1	0	0	0	0	0	0
SK57	1	0	1	0	0	0	0	0	0	0	0	0
SK12 A	0	0	0	0	0	0	0	0	0	0	1	0
SK56	0	0	0	0	0	0	0	0	1	0	0	0

Unit	Chal-co Small Bowl	Black-topped Bowl	RP Stora-ge Vessel	RP Large Bowls	RP Small Bowl	RP Bowl w/ String Impre-ssion	RP Jar	RP Jar/ Amp-hora	RP Amp-hora	RP Jug	RP Spout-ed jug	RP Pan
AM 7/3	0	0	0	0	2	0	0	1	0	0	0	0
AM10	0	1	0	10	8	0	0	0	0	0	0	0
MAL XV	0	4	0	14	41	0	9	0	0	1	0	1
MAC II	0	0	0	2	17	0	0	0	0	0	0	0
MAX CH	0	0	0	1	2	0	0	0	0	1	0	1
MAX CF	0	2	0	5	24	0	5	0	0	0	0	2
MAC XXI	0	0	0	0	5	0	0	0	0	0	0	0
MAC IV	0	4	0	4	10	0	0	0	0	0	0	0
MAC III	0	0	0	0	2	0	1	0	0	0	0	0
SK10	0	0	0	3	17	0	0	4	0	2	0	0
SK27	0	1	0	4	4	0	0	0	1	0	0	0
SK12	0	0	0	8	29	0	0	2	1	2	0	0
SK4	0	0	0	0	3	0	0	0	0	1	0	0
SK18	2	0	0	9	80	0	0	10	1	5	0	0
SK21	0	0	0	0	4	0	0	8	0	0	0	0
SK2	0	0	0	1	92	0	0	1	0	0	0	0
SK12 C	0	0	0	8	1	0	0	0	0	0	0	0
SK44	0	0	0	17	17	0	0	3	0	2	0	0
SK57	0	0	0	14	21	0	0	0	0	2	0	0
SK12 A	0	0	0	1	0	0	0	0	0	0	0	0
SK56	0	0	0	1	7	0	0	2	0	0	0	0

Unit	RP Spout-ed Amp-hora	RP Minia-ture Bowl	RP Juglet	RP Juglet w/ relief	RP Large Spout-ed bowl	RP Cuta-way spout	Rp Cook-ing Pot	RP Dipp-er	RP gourd flask	RP Mott Gridd-le	RP Mott Cook-ing Pot	RP Mott Bowl
AM 7/3	0	0	0	0	0	0	0	0	0	0	0	0
AM10	0	0	1	0	0	0	1	0	0	0	0	0
MAL XV	0	0	2	0	0	0	0	0	0	0	0	0
MAC II	0	0	0	0	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	1	0	0	0	0	0	0	0
MAX CF	0	0	1	0	0	0	0	0	0	0	0	0
MAC XXI	0	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	0	0	0	0	1	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	0	0	0	0	4	0	0	4	0	13
SK27	0	0	0	0	0	0	0	0	0	0	1	11
SK12	0	0	1	0	0	0	0	1	0	0	0	0
SK4	0	0	0	0	0	0	1	0	0	0	0	0
SK18	0	0	3	0	0	1	15	0	0	0	3	5
SK21	0	0	0	0	0	0	0	0	0	0	0	1
SK2	1	1	0	1	1	0	1	0	0	0	1	1
SK12 C	0	0	2	0	0	0	0	0	0	0	3	2
SK44	0	0	0	0	0	0	0	0	0	0	0	12
SK57	0	0	0	0	0	0	0	0	0	0	8	41
SK12 A	0	0	0	0	0	0	0	0	0	0	0	0
SK56	0	0	1	0	0	0	0	0	0	0	3	5

Unit	RP Mott Spout-ed bowl	RP Mott Dipp-er	RP Mott Large bowl	RP Mott Stora-ge Vessel	RP Mott Juglet	RP Mott Clos-ed Vessel	RP Mott Amp-hora	RP Mott Com-posite Vessel	RP Mott Jug	RP Mott Jar	RP Mott Jar/ Amp-hora	RP Gou-rd Juglet
AM 7/3	0	0	0	0	0	0	0	0	0	0	0	1
AM10	0	0	0	2	0	0	0	0	0	0	0	0
MAL XV	0	0	0	0	0	0	0	0	0	0	0	2
MAC II	0	0	0	0	0	0	0	0	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	0	0	0	1
MAX CF	0	0	0	0	0	0	0	0	0	0	0	0
MAC XXI	0	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	0	0	0	0	0	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	6	0	0	0	0	0	0	0	4	0
SK27	1	0	6	1	0	0	1	0	1	0	0	0
SK12	0	0	1	0	0	0	0	0	0	0	1	0
SK4	0	0	0	0	0	0	0	0	0	0	0	0
SK18	0	0	2	0	0	0	0	0	0	1	2	0
SK21	0	0	0	0	0	0	0	1	0	0	0	0
SK2	0	0	0	0	0	0	0	0	0	0	0	0
SK12 C	0	0	2	0	0	0	0	0	0	0	0	0
SK44	0	0	5	0	0	0	0	0	0	0	7	0
SK57	0	0	26	2	0	0	6	0	1	0	0	0
SK12 A	0	0	1	0	0	2	0	0	0	0	0	0
SK56	0	1	7	0	0	0	0	0	0	0	1	0

Unit	DPBC Tanka-rd	DPBC Juglet	DPBC Small Bowl	DPBC Jug	RPP Large Bowl	RPP Small Bowl	PRS Large Bowl	PRS Small Bowl	WPP Small Bowl	BSC Small Bowl	BP Bottle	Coar-se Ware basin
AM 7/3	0	0	0	0	0	0	0	0	0	0	0	0
AM10	0	0	0	0	0	0	0	0	0	0	0	0
MAL XV	0	0	0	0	0	0	0	0	0	0	0	0
MAC II	0	0	0	0	1	3	1	1	0	0	0	0
MAX CH	0	0	0	0	0	0	0	0	1	0	0	0
MAX CF	0	0	0	0	0	1	0	1	0	1	0	0
MAC XXI	0	0	0	0	0	0	0	0	0	0	0	0
MAC IV	0	0	0	0	2	1	0	0	0	0	0	0
MAC III	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	0	0	0	0	0	0	0	0	0	1	0
SK27	0	0	0	0	0	0	0	0	0	0	0	0
SK12	0	0	0	0	0	0	0	0	0	0	0	0
SK4	0	0	0	0	0	0	0	0	0	0	0	1
SK18	0	0	0	1	0	0	0	0	0	0	0	0
SK21	0	1	0	0	0	0	0	0	0	0	0	0
SK2	1	1	0	0	0	0	0	0	0	0	0	0
SK12C	0	0	1	0	0	0	0	0	0	0	0	0
SK44	0	0	0	0	0	0	0	0	0	0	0	0
SK57	0	0	0	1	0	0	0	0	0	0	0	0
SK12A	0	0	0	0	0	0	0	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Coarse Ware Mealing Bin	Coarse Ware Tray	CoarseWare Storage Jar	Cooking Pot	Griddle	Pithos	Shell Frag-ments	Shell Bead	Denta-lium Shell
AM 7/3	0	0	0	0	0	0	0	0	0
AM10	0	1	0	0	2	0	0	0	0
MALXV	0	0	0	1	0	1	0	0	0
MACII	1	0	0	1	0	0	0	0	0
MAXCH	0	0	0	0	0	0	0	0	0
MAXCF	0	0	0	2	0	1	0	0	0
MACXXI	0	0	0	0	0	0	0	0	0
MACIV	1	0	0	0	0	0	0	0	0
MACIII	0	0	0	0	0	0	0	0	0
SK10	0	0	1	0	1	0	0	0	0
SK27	0	0	0	0	0	0	0	0	0
SK12	0	2	0	0	0	0	0	0	0
SK4	0	0	0	0	0	0	0	0	0
SK18	0	0	26	11	0	0	0	0	0
SK21	0	0	0	0	0	0	0	0	0
SK2	0	0	0	0	0	0	0	0	0
SK12C	0	0	0	0	1	0	0	0	0
SK44	0	0	0	0	0	0	0	1	1
SK57	0	0	0	0	0	0	1	0	0
SK12A	0	0	0	0	0	0	0	0	0
SK56	0	0	0	0	0	0	0	0	0

Table B.2: Raw tabulation of artifacts found in the same space as games at ProBA sites.

Unit	Game	Hearth	Platform	Bench	Threshold	Step	Socle Stone	Lime Plaster	Lime bins	Post Support	Pounder	Rubber-Pounder	Rubbing Stone
EP13	3	1	0	1	0	0	0	0	2	2	0	1	0
EP16	1	0	0	2	0	0	0	0	0	0	0	0	0
EP22	3	0	0	0	0	0	0	0	0	0	0	0	0
EP19	1	1	0	1	0	0	0	2	0	0	0	1	1
EP10	1	0	0	1	0	0	0	0	0	2	5	2	2
EP12	1	0	0	0	0	0	0	0	2	0	1	2	1
MP76	1	1	0	0	1	0	1	0	0	0	0	0	0
MP73	1	1	0	0	2	1	0	1	0	0	0	0	0
MT1	1	0	0	0	0	0	0	0	0	0	0	2	0
MTTS	1	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Quern	Rubber	Work Surface	Mortar	Hammerstone	Pecking Stone	Whet-stone	Stone Axe	Stone Weight	Perforated Stone	Mace head	Tethering Stone	Grinder
EP13	0	0	0	0	1	0	0	0	1	0	0	0	4
EP16	0	0	0	1	0	0	0	0	0	0	0	0	0
EP22	0	0	0	0	0	0	0	0	0	0	0	0	0
EP19	4	1	1	1	3	3	1	1	0	0	0	1	0
EP10	4	0	0	1	3	1	2	0	2	0	3	2	1
EP12	1	0	0	0	0	2	1	0	1	0	0	0	1
MP76	0	2	0	0	0	0	2	0	0	2	0	0	0
MP73	1	1	0	0	0	0	0	0	0	0	0	0	0
MT1	0	0	0	0	0	0	0	0	0	0	0	0	0
MTTS	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit	Chlorite Bead	Stone Bowl	Worked Serpentine	Pendant	Loom weight	TC Figurine	Spindle Whorl	Lumps of unbaked clay	Copper Needle	Sheet Copper	Copper Lump	Copper Slag	Casting Waste
EP13	0	1	0	0	0	0	2	0	0	0	0	0	0
EP16	0	1	0	1	1	0	0	0	0	0	0	0	0
EP22	0	0	0	0	0	0	0	0	0	0	0	0	0
EP19	0	0	0	0	0	0	4	0	1	0	0	0	0
EP10	0	0	0	0	1	0	4	0	0	0	0	0	0
EP12	0	0	2	0	0	1	3	0	1	1	0	0	0
MP76	0	0	0	0	0	0	0	0	0	0	0	1	0
MP73	0	0	0	0	0	0	0	0	0	0	0	0	0
MT1	1	0	0	0	2	0	0	0	1	0	1	2	1
MTTS	0	0	0	0	0	0	0	2	0	0	0	0	0

Unit	Bronze Needle	Bronze Hair Ring	RP Bowl w/ String Impression	WP Bowl	BS bowls	BS Jugs	Canaanite Jar	WPW Jug	PWW Crater	CWh Amphoriskos	Myc III:A Pilgrim Flask	CW Spouted Bowl	Pithos
EP13	0	0	0	0	0	0	0	0	0	0	0	0	0
EP16	0	0	0	0	0	0	0	0	0	0	0	0	0
EP22	0	0	0	0	0	0	0	0	0	0	0	0	0
EP19	0	0	0	0	0	0	0	0	0	0	0	0	2
EP10	0	0	0	0	0	0	0	0	0	0	0	0	3
EP12	0	0	0	0	0	0	0	0	0	0	0	0	0
MP76	1	1	0	0	0	0	1	0	0	0	0	0	0
MP73	0	0	0	0	0	0	1	1	1	1	1	0	0
MT1	0	0	0	0	0	0	0	0	0	0	0	1	0
MTTS	0	0	1	2	2	2	0	0	0	0	0	0	2

Table B.3: Categorization of Ceramic Types for PreBA Correspondence Analysis.

Type	**Categories Included**
Heirloom Large Bowl	Chalco Large Bowl, RPP Large Bowl, PRS Large Bowl
Heirloom Small Bowl	Chalco Small bowl, RPP Small Bowl, PRS Small Bowl, WPP Small Bowl, BCS Small Bowl,
Chalco Storage Jar	Chalco Storage Vessel
Imported Small Bowl	DPBC Small Bowl, BP Small Bowl
Imported Juglet	DPBC Juglet, BP Bottle
Imported Serving/Drinking	DPBC Tankard, DPBG Jug
Large Bowls	RP Large Bowls, RP Mott Large Bowl
Small Bowls	Black-topped bowls, RP small bowl, RP bowl with string impression, RP Miniature Bowl, RP Mott Bowl
Jars	RP Jar, RP Mott Jar
Jar/Amphora	RP Mott Jar/Amphora, RP Jar/Amphora
Amphorae	RP Amphora, RP Mott Amphora
Jug	RP Jug, RP Mott Jug
Pan	RP Pan
Spouted Vessels	RP Spouted Jug, RP Spouted Amphora, RP Large Spouted bowl, RP Cutaway Spout, SP Mott Spouted Bowl, Trough Spouts
Juglet	RP Juglet, RP Juglet w/ relief, RP Gourd Flask, RP Mott Juglet, RP Gourd Juglet
Dippers	RP Dipper, RP Mott Dipper
Griddles	RP Mott Griddle, Griddle
Cooking Pots	RP Cooking Pot, RP Mott Cooking Pot
Storage Vessels	RP Storage Vessels, SP Mott Storage Vessel

Table B.4: Categorization of artifacts into functional groups for Correspondence Analysis.

Type	**Categories included**
Picrolite	Picrolite, unworked picrolite, worked picrolite, picrolite debitage
Pounders/Rubbers	Pounders, Rubbers, Rubber-pounders
Grinding Equipment	Querns, Rubbing stones, Grinders, Grinding Surface, pestle
Receptacles	Mortars, Limestone Platters, Troughs, stone bowls, stone basins
Percussion Instruments	Hammerstones, Pecking stones, stone axes, perforated hammers, maceheads, chopping stones
Lime Plaster features	Plaster Mortar, Lime plaster bins, Lime Plaster
Weaving Material	Loomweights, spindle whorls, stone weights
Architectural Features	post support, platform, threshold, bench, soclestone, pivot stone, tethering stone
Food Preparation/Storage	Hearth, hob, pebblecrete emplacement
Modified sherds	roundel, sherd burnisher
Worked Shell	Shell bead, shell fragments, dentalium shell
Pointed Copper Implements	Copper awl, copper needle, copper pin
Copper Smelting	Copper slag, copper ore
Personal Ornaments	bead, Terracotta button/toggle, bone bead, bone pendant
Pointed Bone Impements	bone needle, bone point, bone awl

Table B.5: Tabulation of artifacts from PreBA sites used for CA, once combined into functional types.

Unit	Gam-es	AF	LF	Pic	P/R/R-P	GE	Rec	PI	WM	WSh	PO	CuT
AM7/3	1	1	0	0	1	0	0	2	1	0	0	0
AM10	1	1	0	0	0	1	0	0	0	0	0	0
MA65	1	1	0	0	5	2	2	1	1	1	0	0
MA102	1	0	0	0	2	4	0	0	0	1	0	0
MA90H	1	0	0	0	0	0	1	0	0	0	0	0
MA90F	1	0	0	0	3	0	1	0	0	2	0	0
MA121	1	0	0	0	1	0	1	0	2	0	0	0
MA104	1	1	0	0	1	0	0	0	0	0	0	0
MA103	1	3	1	0	0	0	0	1	0	0	1	0
SK10	6	0	0	3	4	4	0	4	8	0	0	0
SK27	1	2	1	2	5	4	0	1	0	0	0	0
SK12	8	1	0	7	25	6	2	4	2	0	2	1
SK4	1	0	1	0	1	0	1	0	1	1	1	0
SK2	2	4	1	2	7	3	1	1	6	2	0	2
SK12C	5	2	0	5	26	3	0	4	0	0	0	0
SK44	3	0	0	1	1	1	0	5	1	0	0	0
SK57	1	0	0	9	1	0	1	0	3	5	0	3
SK12A	1	0	0	1	4	0	0	2	0	0	0	0
SK56	1	0	0	0	0	0	0	1	0	0	0	0
SK18	1	1	0	10	15	5	2	4	6	0	1	2
SK21	2	0	0	1	13	5	4	4	1	0	0	0

Unit	CuS	PBI	Heirl-oom Large Bowl	Heirl-oom Small Bowl	Chal-co Stora-ge Jar	Impor-ted Small Bowl	Impor-ted Juglet	Impor-ted Servi-ng/ Drink-ing	Large Bowls	Small Bowls	Jars	Jar/ Amp-hora
AM7/ 3	0	0	0	0	0	1	0	0	0	2	0	1
AM10	0	0	0	0	0	0	0	0	10	1	0	0
MA65	0	0	0	0	0	0	0	0	14	44	9	0
MA10 2	0	0	2	4	0	0	0	0	2	17	0	0
MA90 H	0	0	0	1	0	0	0	0	1	2	0	0
MA90 F	0	0	0	3	0	0	0	0	5	26	5	0
MA12 1	0	1	0	0	0	0	0	0	0	5	0	0
MA10 4	0	1	2	1	0	0	0	0	4	14	0	0
MA10 3	0	0	0	0	0	0	0	0	0	2	1	0
SK10	0	0	0	0	0	0	1	0	9	30	0	8
SK27	0	0	1	0	0	0	0	0	10	16	0	0
SK12	0	1	0	0	0	0	0	0	9	29	0	3
SK4	0	0	0	0	0	0	0	0	0	3	0	0
SK2	0	1	0	0	0	0	1	1	1	94	0	1
SK12 C	1	0	0	0	0	1	0	0	10	3	0	0
SK44	0	1	0	0	0	0	0	0	22	29	0	10
SK57	0	0	0	0	0	0	0	1	40	62	0	0
SK12 A	0	0	1	0	0	0	0	0	2	0	0	0
SK56	0	0	0	0	0	0	0	0	8	12	0	3
SK18	0	1	1	1	4	0	0	1	11	85	0	13
SK21	0	3	0	5	0	0	0	0	8	1	0	0

Unit	Amphorae	Jug	Pan	Spouted Vessel	Juglet	Dippers	Griddles	Cooking Pots	Stor Vessels	CW basin	CW Mealing Bin	CW Tray	Shell	Bucranium
AM7/3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
AM10	0	0	0	0	1	0	2	1	2	0	0	1	0	0
MA65	0	1	1	0	4	0	0	1	1	0	0	0	0	0
MA102	0	0	0	0	0	0	0	1	0	0	1	0	0	0
MA90H	0	1	1	1	1	0	0	0	0	0	0	0	0	0
MA90F	0	0	2	0	1	0	0	2	1	0	0	0	0	0
MA121	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA104	0	0	0	0	1	0	0	0	0	0	1	0	0	0
MA103	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SK10	0	2	0	0	0	0	5	4	1	0	0	0	0	0
SK27	2	1	0	1	0	0	0	1	1	0	0	0	0	0
SK12	1	2	0	0	1	1	0	0	0	0	0	2	0	0
SK4	0	1	0	0	0	0	0	1	0	1	0	0	0	0
SK2	0	0	0	2	1	1	0	2	0	0	0	0	0	0
SK12C	0	0	0	0	2	0	1	3	0	0	0	0	0	0
SK44	0	2	0	0	0	0	0	0	0	0	0	0	2	0
SK57	6	3	0	0	0	0	0	8	2	0	0	0	1	0
SK12A	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SK56	0	0	0	0	1	1	0	3	0	0	0	0	0	1
SK18	1	5	0	0	3	0	0	29	26	0	0	0	0	0
SK21	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B.6: Tabulation of artifacts from Marki *Alonia* used for CA, including zooarchaeological and lithic data.

Unit	Gam-es	AF	LF	FP/S	P/R/R-P	GE	Rec	PI	WM	WSh	PO	PBI
MA65	1	1	0	0	5	2	2	1	1	1	0	0
MA102	1	0	0	0	2	4	0	0	0	1	0	0
MA90H	1	0	0	0	0	0	1	0	0	0	0	0
MA90F	1	0	0	1	3	0	1	0	0	2	0	0
MA121	1	0	0	1	1	0	1	0	2	0	0	1
MA104	1	1	0	1	1	0	0	0	0	0	0	1
MA50	1	0	0	0	0	0	0	0	0	0	0	0
MA103	1	3	1	3	0	0	0	1	0	0	1	0

Unit	Black-topp-ed Bowl	RP Large Bow-ls	RP Small Bowl	RP Jar	RP Jug	RP Pan	RP Spou-ted Vess-el	RP Juglet	RP gourd flask	RP Gou-rd Juglet	RPP Large Bowl	RPP Small Bowl
MA65	4	14	41	9	1	1	0	2	0	2	0	0
MA102	0	2	17	0	0	0	0	0	0	0	1	3
MA90H	0	1	2	0	1	1	1	0	0	1	0	0
MA90F	2	5	24	5	0	2	0	1	0	0	0	1
MA121	0	0	5	0	0	0	0	0	0	0	0	0
MA104	4	4	10	0	0	0	0	0	1	0	2	1
MA50	0	0	0	0	0	0	0	0	0	0	0	0
MA103	0	0	2	1	0	0	0	0	0	0	0	0

Table B.7: Tabulation of artifacts from ProBA sites used for CA, once combined into functional types.

Unit	PRS Large Bowl	PRS Small Bowl	WPP Small Bowl	BSC Small Bowl	CW Mealing Bin	Cooking Pot	Pithos	Cattle Bone	Sheep/ Goat bone	Deer Bones	Pig Bones	Blade	Core
MA65	0	0	0	0	0	1	1	1	14	3	0	0	0
MA102	1	1	0	0	1	1	0	2	10	9	2	0	0
MA90H	0	0	1	0	0	0	0	4	6	4	0	0	0
MA90F	0	1	0	1	0	2	1	9	20	7	0	0	0
MA121	0	0	0	0	0	0	0	0	0	0	0	0	0
MA104	0	0	0	0	1	0	0	0	31	8	1	0	0
MA50	0	0	0	0	0	0	0	0	0	0	0	0	0
MA103	0	0	0	0	0	0	0	1	2	1	0	1	1

Unit	Game	AF	Hearth	Lime Feature	PRRP	GE	Rec	PI	WM	Whetstone	PO	TC Figurine
EP21	1	0	0	0	0	0	0	1	0	0	0	0
EP13	3	3	1	2	1	4	1	1	3	0	0	0
EP16	1	2	0	0	0	0	3	0	1	0	1	0
EP22	3	0	0	0	0	0	0	0	0	0	0	0
EP19	1	2	1	2	2	5	1	7	4	1	0	0
EP10	1	5	0	0	7	7	1	7	7	2	0	0
EP12	1	0	0	2	3	3	0	2	4	1	2	1
MA76	1	2	1	0	2	0	0	0	0	2	1	0
MA73	1	3	1	1	1	1	0	0	0	0	0	0
MT1	1	0	0	0	2	0	0	0	2	0	1	0
MTTS	1	0	0	0	0	0	0	0	0	0	0	0

Unit	Lump unbaked clay	Cu Production	Cu Artifacts	Bowls	Spouted Bowls	Jug	Griddle	BS Teapot	BS Teacup	Canaanite Jar	PW Crater	CWh Amphoriskos	Myc III:A Pilgrim Flask	el-Lisht Jug	Pithos
EP21	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
EP13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EP16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EP22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EP19	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
EP10	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3
EP12	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0
MA76	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0
MA73	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0
MT1	0	4	1	0	1	0	0	0	0	0	0	0	0	0	0
MTTS	2	0	1	10	1	4	0	2	2	0	0	0	0	1	5

APPENDIX C

CORRESPONDENCE ANALYSIS RESULTS

Factor	Eigenvalue	Percent	Cumulative Percent
1	0.251	15.902	15.902
2	0.216	13.653	29.556
3	0.173	10.942	40.498
4	0.135	8.564	49.062
5	0.111	7.051	56.113
6	0.104	6.602	62.715
7	0.098	6.181	68.896
8	0.095	5.980	74.877
9	0.068	4.309	79.185
10	0.061	3.865	83.050
11	0.061	3.832	86.882
12	0.050	3.191	90.073
13	0.041	2.579	92.652
14	0.030	1.911	94.563
15	0.026	1.649	96.212
16	0.022	1.383	97.596
17	0.018	1.165	98.761
18	0.011	0.716	99.477
19	0.006	0.372	99.849
20	0.002	0.151	100.000

Table C.1: Eigenvalues and percent inertia for first iteration of PreBA CA. Total inertia=1.581

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AM10	0.017	0.009	0.066	0.183	-0.030
AM7/3	0.009	0.104	0.067	0.898	0.020
MA102	0.027	0.013	0.068	0.074	0.167
MA103	0.010	0.673	0.144	0.582	3.034
MA104	0.022	0.093	0.050	-0.013	0.459
MA121	0.009	0.134	0.031	0.223	0.625
MA65	0.070	0.181	0.073	-0.284	0.332
MA90F	0.042	0.246	0.064	-0.313	0.530
MA90H	0.008	0.035	0.070	0.083	0.556
SK10	0.070	0.083	0.069	-0.005	-0.286
SK12	0.084	0.495	0.062	0.595	-0.110
SK12A	0.009	0.429	0.034	1.262	-0.346
SK12C	0.052	0.726	0.110	1.200	-0.328
SK18	0.179	0.318	0.126	-0.333	-0.337
SK2	0.107	0.264	0.076	-0.350	0.256
SK21	0.037	0.497	0.108	1.201	-0.124
SK27	0.039	0.073	0.029	0.130	0.194
SK4	0.011	0.324	0.121	0.229	1.879
SK44	0.061	0.094	0.067	-0.138	-0.289
SK56	0.024	0.087	0.057	-0.344	-0.292
SK57	0.114	0.274	0.086	-0.428	-0.154

Table C.2: Row variable coordinates for first iteration of PreBA CA.

Name	Factor 1	Factor 2
AM10	0.002	0.000
AM7/3	0.028	0.000
MA102	0.001	0.004
MA103	0.014	0.434
MA104	0.000	0.021
MA121	0.002	0.017
MA65	0.022	0.036
MA90F	0.016	0.054
MA90H	0.000	0.011
SK10	0.000	0.026
SK12	0.118	0.005
SK12A	0.055	0.005
SK12C	0.296	0.026
SK18	0.079	0.094
SK2	0.052	0.033
SK21	0.211	0.003
SK27	0.003	0.007
SK4	0.002	0.179
SK44	0.005	0.024
SK56	0.011	0.010
SK57	0.083	0.013

Table C.3: Row variable contributions to factors for first iteration of PreBA CA.

Name	Factor 1	Factor 2
AM10	0.009	0.000
AM7/3	0.103	0.000
MA102	0.002	0.011
MA103	0.024	0.650
MA104	0.000	0.093
MA121	0.015	0.118
MA65	0.076	0.105
MA90F	0.063	0.182
MA90H	0.001	0.034
SK10	0.000	0.083
SK12	0.479	0.016
SK12A	0.399	0.030
SK12C	0.675	0.051
SK18	0.157	0.161
SK2	0.172	0.092
SK21	0.492	0.005
SK27	0.023	0.050
SK4	0.005	0.319
SK44	0.017	0.077
SK56	0.050	0.036
SK57	0.243	0.031

Table C.4: Row variable squared correlations with factors for first iteration of PreBA CA.

Table C.5: Column Variable Coordinates for first iteration of PreBA CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AF	0.013	0.465	0.054	0.475	1.290
AMPHORAE	0.008	0.063	0.026	-0.408	-0.211
BUCRANIUM	0.001	0.022	0.031	-0.687	-0.629
CHALCO_STORAGE_JAR	0.003	0.210	0.014	-0.664	-0.726
COARSE_WARE_BASIN	0.001	0.184	0.071	0.457	4.045
COARSE_WARE_MEALING_BIN	0.002	0.023	0.031	0.061	0.674
COARSE_WARE_TRAY	0.002	0.081	0.025	0.913	-0.180
COOKING_POTS	0.044	0.301	0.046	-0.411	-0.380
CUS	0.001	0.339	0.014	2.393	-0.706
CUT	0.006	0.224	0.008	-0.512	-0.197
DIPPERS	0.002	0.003	0.014	-0.066	-0.105
FP_S	0.008	0.697	0.090	0.366	2.801
GAMES	0.032	0.612	0.025	0.679	0.094
GE	0.030	0.345	0.029	0.563	-0.144
GRIDDLES	0.006	0.045	0.053	0.384	-0.490
HEIRLOOM_LARGE_BOWL	0.005	0.019	0.048	0.336	0.235
HEIRLOOM_SMALL_BOWL	0.012	0.090	0.075	0.678	0.333
IMPORTED_JUGLET	0.002	0.026	0.008	-0.355	-0.032
IMPORTED_SERVING_DRINKIN	0.002	0.352	0.004	-0.739	-0.168
IMPORTED_SMALL_BOWL	0.002	0.137	0.051	2.092	-0.331

Name	Mass	Quality	Inertia	Factor 1	Factor 2
JARS	0.012	0.243	0.086	-0.470	1.245
JAR_AMPHORA	0.031	0.228	0.052	-0.227	-0.579
JUG	0.014	0.048	0.014	-0.209	-0.067
JUGLET	0.013	0.018	0.023	0.118	0.133
LARGE_BOWLS	0.130	0.064	0.079	0.003	-0.197
LF	0.003	0.646	0.041	0.294	2.886
PAN	0.003	0.091	0.044	-0.412	1.048
PBI	0.007	0.143	0.031	0.795	0.055
PI	0.027	0.511	0.037	0.821	-0.210
PIC	0.032	0.352	0.021	0.236	-0.414
PO	0.004	0.454	0.034	0.666	1.875
P_R_R_P	0.090	0.815	0.119	1.014	-0.217
REC	0.013	0.165	0.033	0.524	0.399
SH	0.002	0.068	0.017	-0.468	-0.526
SMALL_BOWLS	0.374	0.665	0.077	-0.361	0.080
SPOUTED_VESSELS	0.003	0.048	0.034	-0.243	0.679
STORAGE_VESSELS	0.027	0.232	0.069	-0.564	-0.529
WM	0.025	0.012	0.031	-0.117	-0.026
WSH	0.009	0.269	0.023	-0.573	0.571

Name	Factor 1	Factor 2
AF	0.012	0.103
AMPHORAE	0.005	0.002
BUCRANIUM	0.001	0.001
CHALCO_STORAGE_JAR	0.005	0.008
COARSE_WARE_BASIN	0.001	0.059
COARSE_WARE_MEALING_BIN	0.000	0.003
COARSE_WARE_TRAY	0.008	0.000
COOKING_POTS	0.029	0.029
CUS	0.018	0.002
CUT	0.007	0.001
DIPPERS	0.000	0.000
FP_S	0.004	0.285
GAMES	0.059	0.001
GE	0.038	0.003
GRIDDLES	0.004	0.007
HEIRLOOM_LARGE_BOWL	0.002	0.001
HEIRLOOM_SMALL_BOWL	0.021	0.001
IMPORTED_JUGLET	0.001	0.000
IMPORTED_SERVING_DRINKIN	0.005	0.000
IMPORTED_SMALL_BOWL	0.027	0.001
JARS	0.010	0.084
JAR_AMPHORA	0.006	0.047
JUG	0.002	0.000
JUGLET	0.001	0.001
LARGE_BOWLS	0.000	0.023
LF	0.001	0.121
PAN	0.002	0.016
PBI	0.018	0.000
PI	0.071	0.005
PIC	0.007	0.025
PO	0.007	0.064
P_R_R_P	0.369	0.020
REC	0.014	0.009
SH	0.002	0.003
SMALL_BOWLS	0.194	0.011
SPOUTED_VESSELS	0.001	0.007
STORAGE_VESSELS	0.034	0.035
WM	0.001	0.000
WSH	0.012	0.014

Table C.6: Column variable contributions to factors of first iteration of PreBA CA.

Name	Factor 1	Factor 2	Name	Factor 1	Factor 2
AF	0.056	0.409	IMPORTED_SMALL_BOWL	0.133	0.003
AMPHORAE	0.050	0.013	JARS	0.030	0.213
BUCRANIUM	0.012	0.010	JAR_AMPHORA	0.030	0.213
CHALCO_STORAGE_JAR	0.096	0.114	JUG	0.030	0.198
COARSE_WARE_BASIN	0.002	0.181	JUGLET	0.008	0.010
COARSE_WARE_MEALING_BIN	0.000	0.023	LARGE_BOWLS	0.000	0.064
COARSE_WARE_TRAY	0.078	0.003	LF	0.007	0.640
COOKING_POTS	0.162	0.139	PAN	0.012	0.079
CUS	0.312	0.027	PBI	0.143	0.001
CUT	0.195	0.029	PI	0.480	0.031
DIPPERS	0.001	0.002	PIC	0.086	0.266
FP_S	0.012	0.686	PO	0.051	0.404
GAMES	0.601	0.012	P_R_R_P	0.780	0.036
GE	0.323	0.021	REC	0.104	0.061
GRIDDLES	0.017	0.028	SH	0.030	0.038
HEIRLOOM_LARGE_BOWL	0.013	0.006	SMALL_BOWLS	0.634	0.031
HEIRLOOM_SMALL_BOWL	0.072	0.017	SPOUTED_VESSELS	0.005	0.042
IMPORTED_JUGLET	0.026	0.000	STORAGE_VESSELS	0.124	0.109
IMPORTED_SERVING_DRINKIN	0.335	0.017	WM	0.011	0.001
			WSH	0.135	0.134

Table C.7: Column variable squared correlations with factors for first iteration of PreBA CA.

Factor	Eigenvalue	Percent	Cumulative Percent
1	0.252	16.418	16.418
2	0.189	12.358	28.776
3	0.161	10.498	39.274
4	0.136	8.848	48.122
5	0.114	7.456	55.578
6	0.106	6.941	62.519
7	0.096	6.273	68.792
8	0.088	5.717	74.509
9	0.068	4.441	78.949
10	0.061	3.968	82.917
11	0.059	3.833	86.750
12	0.050	3.292	90.043
13	0.041	2.661	92.704
14	0.031	2.041	94.745
15	0.024	1.576	96.321
16	0.021	1.343	97.663
17	0.017	1.129	98.793
18	0.011	0.745	99.537
19	0.005	0.320	99.857
20	0.002	0.143	100.000

Table C.8: Eigenvalues and percent inertia for second iteration of PreBA CA. Total inertia=1.532

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AM10	0.017	0.083	0.066	0.173	0.549
AM7/3	0.009	0.108	0.067	0.901	0.153
MA102	0.028	0.163	0.068	0.066	-0.631
MA103	0.008	0.168	0.103	0.455	-1.408
MA104	0.021	0.124	0.049	-0.051	-0.533
MA121	0.009	0.032	0.026	0.171	-0.261
MA65	0.070	0.413	0.073	-0.293	-0.585
MA90F	0.041	0.533	0.065	-0.347	-0.847
MA90H	0.008	0.166	0.070	0.060	-1.214
SK10	0.070	0.174	0.068	0.011	0.410
SK12	0.084	0.504	0.061	0.602	0.062
SK12A	0.009	0.420	0.034	1.275	0.177
SK12C	0.052	0.730	0.110	1.214	0.256
SK18	0.180	0.448	0.125	-0.313	0.461
SK2	0.107	0.287	0.077	-0.362	-0.273
SK21	0.037	0.534	0.108	1.203	-0.323
SK27	0.039	0.029	0.029	0.118	-0.088
SK4	0.010	0.080	0.125	0.124	-0.978
SK44	0.062	0.096	0.066	-0.120	0.298
SK56	0.024	0.090	0.057	-0.326	0.322
SK57	0.115	0.253	0.085	-0.416	0.120

Table C.9: Row variable coordinates for second iteration of PreBA CA.

Name	Factor 1	Factor 2
AM10	0.002	0.026
AM7/3	0.028	0.001
MA102	0.000	0.058
MA103	0.007	0.083
MA104	0.000	0.032
MA121	0.001	0.003
MA65	0.024	0.127
MA90F	0.020	0.156
MA90H	0.000	0.061
SK10	0.000	0.062
SK12	0.122	0.002
SK12A	0.056	0.001
SK12C	0.305	0.018
SK18	0.070	0.202
SK2	0.056	0.042
SK21	0.213	0.020
SK27	0.002	0.002
SK4	0.001	0.052
SK44	0.004	0.029
SK56	0.010	0.013
SK57	0.079	0.009

Table C.10: Row variable contributions to factors for second iteration of PreBA CA.

Name	Factor 1	Factor 2
AM10	0.007	0.075
AM7/3	0.105	0.003
MA102	0.002	0.162
MA103	0.016	0.152
MA104	0.001	0.123
MA121	0.010	0.023
MA65	0.083	0.331
MA90F	0.077	0.456
MA90 H	0.000	0.165
SK10	0.000	0.174
SK12	0.498	0.005
SK12A	0.412	0.008
SK12C	0.699	0.031
SK18	0.141	0.307
SK2	0.183	0.104
SK21	0.498	0.036
SK27	0.019	0.010
SK4	0.001	0.079
SK44	0.013	0.083
SK56	0.046	0.045
SK57	0.234	0.019

Table C.11: Row variable squared correlations with factors for second iteration of PreBA CA.

Table C.12: Column variable coordinates for second iteration of PreBA CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AF	0.013	0.123	0.067	0.422	-0.659
AMPHORAE	0.008	0.064	0.026	-0.393	0.245
BUCRANIUM	0.001	0.024	0.031	-0.650	0.740
CHALCO_STORAGE_JAR	0.003	0.331	0.014	-0.623	1.059
COARSE_WARE_BASIN	0.001	0.053	0.076	0.248	-2.247
COARSE_WARE_MEALING_BIN	0.002	0.090	0.031	0.015	-1.338
COARSE_WARE_TRAY	0.002	0.101	0.026	0.915	0.516
COOKING_POTS	0.044	0.455	0.046	-0.389	0.563
CUS	0.001	0.341	0.014	2.420	0.589
CUT	0.006	0.225	0.008	-0.498	0.229
DIPPERS	0.002	0.002	0.014	-0.057	0.085
GAMES	0.032	0.582	0.025	0.674	-0.046
GE	0.030	0.335	0.029	0.570	-0.033
GRIDDLES	0.006	0.130	0.055	0.402	0.978
HEIRLOOM_LARGE_BOWL	0.006	0.050	0.048	0.316	-0.584
HEIRLOOM_SMALL_BOWL	0.012	0.303	0.075	0.656	-1.221
IMPORTED_JUGLET	0.002	0.030	0.008	-0.351	0.157
IMPORTED_SERVING_DRINKIN	0.002	0.360	0.004	-0.725	0.236
IMPORTED_SMALL_BOWL	0.002	0.143	0.051	2.108	0.470

Name	Mass	Quality	Inertia	Factor 1	Factor 2
JARS	0.012	0.414	0.088	-0.520	-1.672
JAR_AMPHORA	0.031	0.388	0.052	-0.195	0.783
JUG	0.014	0.069	0.014	-0.201	0.171
JUGLET	0.013	0.060	0.023	0.114	-0.301
LARGE_BOWLS	0.131	0.038	0.080	0.014	0.151
LF	0.003	0.166	0.048	0.167	-1.578
PAN	0.003	0.305	0.044	-0.462	-2.007
PBI	0.007	0.157	0.032	0.783	-0.310
PI	0.027	0.533	0.038	0.833	0.242
PIC	0.032	0.428	0.021	0.258	0.452
PO	0.004	0.102	0.040	0.587	-0.828
P_R_R_P	0.091	0.804	0.118	1.023	0.060
REC	0.013	0.278	0.034	0.503	-0.700
SH	0.002	0.068	0.017	-0.436	0.549
SMALL_BOWLS	0.376	0.731	0.077	-0.362	-0.135
SPOUTED_VESSELS	0.003	0.111	0.034	-0.272	-1.062
STORAGE_VESSELS	0.027	0.378	0.069	-0.535	0.825
WM	0.025	0.046	0.032	-0.116	0.211
WSH	0.009	0.363	0.023	-0.599	-0.734

Name	Factor 1	Factor 2	Name	Factor 1	Factor 2
AF	0.010	0.031	JARS	0.013	0.175
AMPHORAE	0.005	0.003	JAR_AMPHORA	0.005	0.100
BUCRANIUM	0.001	0.002	JUG	0.002	0.002
CHALCO_STORAGE_JAR	0.005	0.019	JUGLET	0.001	0.006
COARSE_WARE_BASIN	0.000	0.021	LARGE_BOWLS	0.000	0.016
COARSE_WARE_MEALING_BIN	0.000	0.015	LF	0.000	0.041
COARSE_WARE_TRAY	0.008	0.003	PAN	0.003	0.067
COOKING_POTS	0.027	0.074	PBI	0.017	0.004
CUS	0.018	0.001	PI	0.074	0.008
CUT	0.006	0.002	PIC	0.009	0.035
DIPPERS	0.000	0.000	PO	0.005	0.014
GAMES	0.058	0.000	P_R_R_P	0.377	0.002
GE	0.039	0.000	REC	0.013	0.033
GRIDDLES	0.004	0.032	SH	0.002	0.004
HEIRLOOM_LARGE_BOWL	0.002	0.010	SMALL_BOWLS	0.196	0.036
HEIRLOOM_SMALL_BOWL	0.020	0.093	SPOUTED_VESSELS	0.001	0.019
IMPORTED_JUGLET	0.001	0.000	STORAGE_VESSELS	0.031	0.097
IMPORTED_SERVING_DRINKIN	0.005	0.001	WM	0.001	0.006
IMPORTED_SMALL_BOWL	0.028	0.002	WSH	0.013	0.027

Table C.13: Column variable contributions to factors for second iteration of PreBA CA.

Name	Factor 1	Factor 2
AF	0.036	0.087
AMPHORAE	0.046	0.018
BUCRANIUM	0.011	0.014
CHALCO_STORAGE_JAR	0.085	0.246
COARSE_WARE_BASIN	0.001	0.052
COARSE_WARE_MEALING_BIN	0.000	0.090
COARSE_WARE_TRAY	0.076	0.024
COOKING_POTS	0.147	0.308
CUS	0.322	0.019
CUT	0.186	0.039
DIPPERS	0.001	0.001
GAMES	0.579	0.003
GE	0.334	0.001
GRIDDLES	0.019	0.111
HEIRLOOM_LARGE_BOWL	0.011	0.039
HEIRLOOM_SMALL_BOWL	0.068	0.235
IMPORTED_JUGLET	0.025	0.005
IMPORTED_SERVING_DRINKIN	0.325	0.034
IMPORTED_SMALL_BOWL	0.136	0.007

Name	Factor 1	Factor 2
JARS	0.037	0.378
JAR_AMPHORA	0.023	0.365
JUG	0.040	0.029
JUGLET	0.007	0.052
LARGE_BOWLS	0.000	0.037
LF	0.002	0.164
PAN	0.015	0.290
PBI	0.135	0.021
PI	0.491	0.042
PIC	0.105	0.322
PO	0.034	0.068
P_R_R_P	0.802	0.003
REC	0.095	0.183
SH	0.027	0.042
SMALL_BOWLS	0.642	0.089
SPOUTED_VESSELS	0.007	0.104
STORAGE_VESSELS	0.112	0.266
WM	0.011	0.036
WSH	0.145	0.218

Table C.14: Column variable squared correlations with factors for second iteration of PreBA CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.379	23.861	23.861
2	0.294	18.504	42.364
3	0.176	11.117	53.481
4	0.150	9.431	62.912
5	0.143	8.986	71.898
6	0.119	7.524	79.422
7	0.091	5.717	85.139
8	0.076	4.812	89.951
9	0.071	4.488	94.440
10	0.047	2.932	97.371
11	0.042	2.629	100.000

Table C.15: Eigenvalues and percent inertia for Sotira *Kaminoudhia* CA. Total inertia=1.587

Name	Mass	Quality	Inertia	Factor 1	Factor 2
SK10	0.088	0.020	0.089	-0.141	-0.010
SK12	0.107	0.484	0.088	0.410	0.478
SK12A	0.011	0.259	0.069	0.007	1.272
SK12C	0.066	0.564	0.143	0.132	1.097
SK18	0.221	0.609	0.177	0.494	-0.492
SK2	0.136	0.432	0.164	0.482	-0.537
SK21	0.050	0.502	0.187	0.710	1.169
SK27	0.050	0.312	0.093	-0.705	0.287
SK4	0.014	0.027	0.155	0.460	-0.295
SK44	0.078	0.139	0.099	-0.415	0.060
SK56	0.031	0.200	0.104	-0.810	-0.125
SK57	0.146	0.866	0.218	-1.125	-0.168

Table C.16: Row variable coordinates for Sotira *Kaminoudhia* CA.

Name	Factor 1	Factor 2
SK10	0.005	0.000
SK12	0.048	0.084
SK12A	0.000	0.061
SK12C	0.003	0.271
SK18	0.143	0.183
SK2	0.084	0.134
SK21	0.067	0.233
SK27	0.066	0.014
SK4	0.008	0.004
SK44	0.035	0.001
SK56	0.054	0.002
SK57	0.489	0.014

Table C.17: Row variable contributions to factors for Sotira *Kaminoudhia.* CA.

Name	Factor 1	Factor 2
SK10	0.020	0.000
SK12	0.205	0.279
SK12A	0.000	0.259
SK12C	0.008	0.556
SK18	0.306	0.303
SK2	0.193	0.239
SK21	0.135	0.367
SK27	0.267	0.044
SK4	0.019	0.008
SK44	0.136	0.003
SK56	0.195	0.005
SK57	0.847	0.019

Table C.18: Row variable squared correlations with factors for Sotira *Kaminoudhia* CA.

Table C.19: Column variable coordinates for Sotira *Kaminoudhia* CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AF	0.010	0.051	0.017	0.274	0.112
BL__CHALCO__LARGE_BOWL	0.002	0.090	0.053	-0.567	1.439
BUCRANIUM	0.001	0.057	0.031	-1.317	-0.230
COARSE_WARE_BASIN	0.001	0.012	0.070	0.747	-0.544
COARSE_WARE_TRAY	0.002	0.147	0.017	0.666	0.883
COOKING_POT	0.011	0.418	0.039	0.803	-0.908
CUS	0.001	0.293	0.014	0.214	2.024
CUT	0.008	0.322	0.007	-0.206	-0.480
CW_STORAGE_JAR	0.027	0.422	0.087	0.765	-0.875
DPBC_JUG	0.002	0.344	0.004	-0.512	-0.609
DPBC_JUGLET	0.002	0.219	0.012	0.968	0.584
DPBC_SMALL_BOWL	0.001	0.293	0.014	0.214	2.024
DPBC_TANKARD	0.001	0.252	0.006	0.783	-0.990
FP_S	0.003	0.013	0.030	0.128	-0.335
GAMES	0.032	0.547	0.025	0.130	0.645
GE	0.031	0.562	0.023	0.342	0.542
GRIDDLE	0.002	0.179	0.011	-0.008	1.003
LF	0.003	0.013	0.030	0.128	-0.335
PBI	0.006	0.346	0.029	0.706	1.080
PI	0.030	0.589	0.027	0.180	0.704
PIC	0.041	0.158	0.012	-0.088	0.197
PO	0.004	0.087	0.024	0.721	0.078
P_R_R_P	0.102	0.862	0.124	0.455	0.916

Name	Mass	Quality	Inertia	Factor 1	Factor 2
REC	0.011	0.289	0.031	0.659	0.613
RP_AMPHORA	0.003	0.015	0.008	0.108	0.168
RP_COOKING_POT	0.021	0.470	0.040	0.603	-0.725
RP_DIPPER	0.001	0.147	0.008	0.666	0.883
RP_JAR_AMPHORA	0.030	0.206	0.043	0.460	0.292
RP_JUG	0.014	0.097	0.011	0.045	-0.268
RP_JUGLET	0.008	0.114	0.011	0.371	0.123
RP_LARGE_BOWLS	0.066	0.337	0.048	-0.433	0.240
RP_MOTT_AMPHORA	0.007	0.684	0.031	-1.730	-0.189
RP_MOTT_BOWL	0.091	0.943	0.114	-1.086	-0.069
RP_MOTT_COMPOSITE_VESSEL	0.001	0.316	0.019	1.153	2.158
RP_MOTT_COOKING_POT	0.019	0.443	0.030	-0.836	-0.015
RP_MOTT_DIPPER	0.001	0.057	0.031	-1.317	-0.230
RP_MOTT_GRIDDLE	0.004	0.005	0.041	-0.229	-0.018
RP_MOTT_JAR_AMPHORA	0.016	0.027	0.040	-0.242	-0.086
RP_MOTT_JUG	0.002	0.390	0.011	-1.486	0.111
RP_MOTT_LARGE_BOWL	0.056	0.919	0.084	-1.172	-0.010
RP_MOTT_SPOUTED_BOWL	0.001	0.084	0.019	-1.145	0.530
RP_MOTT_STORAGE_VESSEL	0.003	0.602	0.013	-1.600	-0.029
RP_SMALL_BOWL	0.278	0.738	0.132	0.342	-0.484
RP_SPOUTED_VESSEL	0.002	0.252	0.013	0.783	-0.990
SH	0.003	0.206	0.016	-1.059	-0.030
WM	0.028	0.181	0.020	0.170	-0.321
WS	0.002	0.316	0.038	1.153	2.158
WSH	0.008	0.304	0.026	-0.853	-0.509

Name	Factor 1	Factor 2
AF	0.002	0.000
BL__CHALCO__LARGE_BOWL	0.002	0.014
BUCRANIUM	0.005	0.000
COARSE_WARE_BASIN	0.001	0.001
COARSE_WARE_TRAY	0.002	0.005
COOKING_POT	0.019	0.031
CUS	0.000	0.014
CUT	0.001	0.006
CW_STORAGE_JAR	0.042	0.071
DPBC_JUG	0.001	0.003
DPBC_JUGLET	0.005	0.002
DPBC_SMALL_BOWL	0.000	0.014
DPBC_TANKARD	0.002	0.003
FP_S	0.000	0.001
GAMES	0.001	0.045
GE	0.010	0.031
GRIDDLE	0.000	0.007
LF	0.000	0.001
PBI	0.008	0.024
PI	0.003	0.051
PIC	0.001	0.005
PO	0.005	0.000
P_R_R_P	0.056	0.292
REC	0.013	0.014

Name	Factor 1	Factor 2
RP_AMPHORA	0.000	0.000
RP_COOKING_POT	0.020	0.038
RP_DIPPER	0.001	0.003
RP_JAR_AMPHORA	0.017	0.009
RP_JUG	0.000	0.003
RP_JUGLET	0.003	0.000
RP_LARGE_BOWLS	0.033	0.013
RP_MOTT_AMPHORA	0.055	0.001
RP_MOTT_BOWL	0.284	0.001
RP_MOTT_COMPOSITE_VESSEL	0.004	0.016
RP_MOTT_COOKING_POT	0.035	0.000
RP_MOTT_DIPPER	0.005	0.000
RP_MOTT_GRIDDLE	0.001	0.000
RP_MOTT_JAR_AMPHORA	0.002	0.000
RP_MOTT_JUG	0.012	0.000
RP_MOTT_LARGE_BOWL	0.204	0.000
RP_MOTT_SPOUTED_BOWL	0.003	0.001
RP_MOTT_STORAGE_VESSEL	0.020	0.000
RP_SMALL_BOWL	0.086	0.221
RP_SPOUTED_VESSEL	0.003	0.007
SH	0.009	0.000
WM	0.002	0.010
WS	0.007	0.032
WSH	0.015	0.007

Table C.20: Column variable contributions to factors from Sotira *Kaminoudhia* CA.

Name	Factor 1	Factor 2
AF	0.044	0.007
BL__CHALCO__LARGE_BOWL	0.012	0.078
BUCRANIUM	0.056	0.002
COARSE_WARE_BASIN	0.008	0.004
COARSE_WARE_TRAY	0.053	0.094
COOKING_POT	0.184	0.235
CUS	0.003	0.290
CUT	0.050	0.272
CW_STORAGE_JAR	0.183	0.239
DPBC_JUG	0.143	0.202
DPBC_JUGLET	0.161	0.059
DPBC_SMALL_BOWL	0.003	0.290
DPBC_TANKARD	0.097	0.155
FP_S	0.002	0.011
GAMES	0.021	0.526
GE	0.160	0.402
GRIDDLE	0.000	0.179
LF	0.002	0.011
PBI	0.104	0.242
PI	0.036	0.553
PIC	0.026	0.132
PO	0.086	0.001
P_R_R_P	0.170	0.692
REC	0.155	0.134

Name	Factor 1	Factor 2
RP_AMPHORA	0.004	0.010
RP_COOKING_POT	0.192	0.278
RP_DIPPER	0.053	0.094
RP_JAR_AMPHORA	0.147	0.059
RP_JUG	0.003	0.094
RP_JUGLET	0.103	0.011
RP_LARGE_BOWLS	0.258	0.079
RP_MOTT_AMPHORA	0.676	0.008
RP_MOTT_BOWL	0.940	0.004
RP_MOTT_COMPOSITE_VESSEL	0.070	0.246
RP_MOTT_COOKING_POT	0.442	0.000
RP_MOTT_DIPPER	0.056	0.002
RP_MOTT_GRIDDLE	0.005	0.000
RP_MOTT_JAR_AMPHORA	0.024	0.003
RP_MOTT_JUG	0.388	0.002
RP_MOTT_LARGE_BOWL	0.919	0.000
RP_MOTT_SPOUTED_BOWL	0.069	0.015
RP_MOTT_STORAGE_VESSEL	0.602	0.000
RP_SMALL_BOWL	0.246	0.492
RP_SPOUTED_VESSEL	0.097	0.155
SH	0.206	0.000
WM	0.040	0.141
WS	0.070	0.246
WSH	0.225	0.080

Table C.21: Column variable squared correlations with factors for Sotira *Kaminoudhia* CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.342	31.137	31.137
2	0.226	20.576	51.713
3	0.180	16.427	68.140
4	0.165	15.059	83.199
5	0.119	10.821	94.021
6	0.066	5.979	100.000

Table C.22: Eigenvalues and percent inertia for first iteration of Marki *Alonia* CA. Total inertia=1.099

Name	Mass	Quality	Inertia	Factor 1	Factor 2
MA102	0.154	0.219	0.123	-0.289	0.302
MA103	0.045	0.988	0.319	2.616	0.355
MA104	0.181	0.321	0.132	-0.083	0.476
MA121	0.032	0.573	0.191	0.522	-1.777
MA65	0.287	0.490	0.111	-0.109	-0.422
MA90F	0.237	0.074	0.063	-0.140	-0.001
MA90H	0.064	0.095	0.160	-0.171	0.459

Table C.23: Row variable coordinates for first iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
MA102	0.038	0.062
MA103	0.904	0.025
MA104	0.004	0.181
MA121	0.025	0.446
MA65	0.010	0.226
MA90F	0.014	0.000
MA90H	0.005	0.059

Table C.24: Row variable contributions to factors for first iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
MA102	0.104	0.114
MA103	0.970	0.018
MA104	0.010	0.311
MA121	0.045	0.528
MA65	0.031	0.460
MA90F	0.074	0.000
MA90H	0.012	0.084

Table C.25: Row variable squared correlations with factors for first iteration of Marki *Alonia* CA.

Table C.26: Column variable coordinates for first iteration of Marki *Alonia* CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
AF	0.013	0.966	0.097	2.618	0.471
BLACK_TOPPED_BOWL	0.027	0.056	0.016	-0.179	0.045
BSC_SMALL_BOWL	0.003	0.018	0.009	-0.240	-0.001
CATTLE_BONE	0.045	0.070	0.056	-0.001	0.293
COARSE_WARE_MEALING_BIN	0.005	0.385	0.011	-0.318	0.818
COOKING_POT	0.011	0.130	0.007	-0.290	-0.064
DEER_BONES	0.085	0.726	0.030	-0.141	0.489
FP_S	0.016	0.951	0.090	2.321	-0.083
GAMES	0.019	0.445	0.015	0.573	-0.183
GE	0.016	0.075	0.036	-0.391	0.128
LF	0.003	0.974	0.056	4.472	0.747
PBI	0.005	0.245	0.044	0.375	-1.368
PI	0.005	0.852	0.029	2.143	-0.070
PIG_BONES	0.008	0.287	0.020	-0.377	0.757
PITHOS	0.005	0.262	0.005	-0.213	-0.444
PO	0.003	0.974	0.056	4.472	0.747
PRS_LARGE_BOWL	0.003	0.118	0.015	-0.494	0.635
PRS_SMALL_BOWL	0.005	0.140	0.009	-0.367	0.317
P_R_R_P	0.032	0.877	0.010	-0.157	-0.492
REC	0.013	0.515	0.021	-0.002	-0.910
RPP_LARGE_BOWL	0.008	0.386	0.017	-0.259	0.879
RPP_SMALL_BOWL	0.013	0.276	0.023	-0.373	0.581
RP_GOURD_FLASK	0.003	0.226	0.012	-0.142	1.001
RP_GOURD_JUGLET	0.008	0.053	0.018	-0.221	-0.270
RP_JAR	0.040	0.298	0.033	0.107	-0.483
RP_JUG	0.005	0.015	0.020	-0.239	0.039

Name	Mass	Quality	Inertia	Factor 1	Factor 2
RP_JUGLET	0.008	0.385	0.008	-0.204	-0.592
RP_LARGE_BOWLS	0.069	0.290	0.025	-0.217	-0.238
RP_PAN	0.011	0.046	0.013	-0.239	0.019
RP_SMALL_BOWL	0.269	0.733	0.038	-0.103	-0.306
RP_SPOUTED_VESSEL	0.003	0.069	0.039	-0.292	0.965
SHEEP_GOAT_BONE	0.221	0.538	0.067	-0.115	0.388
WM	0.008	0.605	0.106	0.533	-2.787
WPP_SMALL_BOWL	0.003	0.069	0.039	-0.292	0.965
WSH	0.011	0.130	0.007	-0.290	-0.064

Name	Factor 1	Factor 2
AF	0.266	0.013
BLACK_TOPPED_BOWL	0.002	0.000
BSC_SMALL_BOWL	0.000	0.000
CATTLE_BONE	0.000	0.017
COARSE_WARE_MEALING_BIN	0.002	0.016
COOKING_POT	0.003	0.000
DEER_BONES	0.005	0.090
FP_S	0.251	0.000
GAMES	0.018	0.003
GE	0.007	0.001
LF	0.156	0.007
PBI	0.002	0.044
PI	0.071	0.000
PIG_BONES	0.003	0.020
PITHOS	0.001	0.005
PO	0.156	0.007
PRS_LARGE_BOWL	0.002	0.005
PRS_SMALL_BOWL	0.002	0.002
P_R_R_P	0.002	0.034
REC	0.000	0.049
RPP_LARGE_BOWL	0.002	0.027
RPP_SMALL_BOWL	0.005	0.020
RP_GOURD_FLASK	0.000	0.012
RP_GOURD_JUGLET	0.001	0.003
RP_JAR	0.001	0.041
RP_JUG	0.001	0.000
RP_JUGLET	0.001	0.012
RP_LARGE_BOWLS	0.010	0.017
RP_PAN	0.002	0.000
RP_SMALL_BOWL	0.008	0.111
RP_SPOUTED_VESSEL	0.001	0.011
SHEEP_GOAT_BONE	0.009	0.147
WM	0.007	0.274
WPP_SMALL_BOWL	0.001	0.011
WSH	0.003	0.000

Table C.27: Column variable contributions to factors for first iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
AF	0.936	0.030
BLACK_TOPPED_BOWL	0.053	0.003
BSC_SMALL_BOWL	0.018	0.000
CATTLE_BONE	0.000	0.070
COARSE_WARE_MEALING_BIN	0.051	0.334
COOKING_POT	0.124	0.006
DEER_BONES	0.056	0.670
FP_S	0.950	0.001
GAMES	0.404	0.041
GE	0.068	0.007
LF	0.947	0.026
PBI	0.017	0.228
PI	0.851	0.001
PIG_BONES	0.057	0.230
PITHOS	0.049	0.213
PO	0.947	0.026
PRS_LARGE_BOWL	0.045	0.074
PRS_SMALL_BOWL	0.080	0.060
P_R_R_P	0.081	0.795
REC	0.000	0.515
RPP_LARGE_BOWL	0.031	0.355
RPP_SMALL_BOWL	0.081	0.196
RP_GOURD_FLASK	0.004	0.221
RP_GOURD_JUGLET	0.021	0.032
RP_JAR	0.014	0.284
RP_JUG	0.015	0.000
RP_JUGLET	0.041	0.344
RP_LARGE_BOWLS	0.132	0.158
RP_PAN	0.046	0.000
RP_SMALL_BOWL	0.074	0.659
RP_SPOUTED_VESSEL	0.006	0.064
SHEEP_GOAT_BONE	0.043	0.495
WM	0.021	0.584
WPP_SMALL_BOWL	0.006	0.064
WSH	0.124	0.006

Table C.28: Column variable squared correlations with factors for first iteration of Marki *Alonia* CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.237	28.053	28.053
2	0.183	21.650	49.703
3	0.168	19.865	69.568
4	0.120	14.219	83.788
5	0.074	8.743	92.531
6	0.063	7.469	100.000

Table C.29: Eigenvalues and percent inertia for second iteration of Marki *Alonia* CA. Total inertia=0.846

Name	Mass	Quality	Inertia	Factor 1	Factor 2
MA102	0.160	0.389	0.118	0.330	-0.422
MA103	0.025	0.052	0.074	-0.074	0.388
MA104	0.182	0.564	0.134	0.482	-0.430
MA121	0.030	0.680	0.198	-2.016	-0.608
MA65	0.295	0.431	0.105	-0.382	0.091
MA90F	0.242	0.173	0.058	0.034	0.201
MA90H	0.066	0.663	0.158	0.406	1.192

Table C.30: Row variable coordinates for second iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
MA102	0.074	0.155
MA103	0.001	0.020
MA104	0.178	0.183
MA121	0.519	0.061
MA65	0.182	0.013
MA90F	0.001	0.054
MA90H	0.046	0.513

Table C.31: Row variable contribution to factors for second iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
MA102	0.148	0.241
MA103	0.002	0.051
MA104	0.314	0.250
MA121	0.623	0.057
MA65	0.408	0.023
MA90F	0.005	0.168
MA90H	0.069	0.594

Table C.32: Row variable squared correlations with factors for second iteration of Marki *Alonia* CA.

Table C.33: Column variable coordinates for second iteration of Marki *Alonia* CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
BLACK_TOPPED_BOWL	0.028	0.100	0.016	0.096	-0.223
BSC_SMALL_BOWL	0.003	0.072	0.009	0.070	0.471
CATTLE_BONE	0.047	0.647	0.058	0.258	0.854
COARSE_WARE_MEALING_BIN	0.006	0.869	0.011	0.834	-0.995
COOKING_POT	0.011	0.003	0.007	0.008	0.042
DEER_BONES	0.088	0.675	0.030	0.480	-0.029
GAMES	0.019	0.122	0.023	-0.357	0.138
GE	0.017	0.176	0.036	0.191	-0.587
PBI	0.006	0.458	0.048	-1.574	-1.213
PI	0.006	0.054	0.055	-0.468	0.559
PIG_BONES	0.008	0.667	0.020	0.782	-0.992
PITHOS	0.006	0.278	0.005	-0.357	0.341
PRS_LARGE_BOWL	0.003	0.272	0.014	0.678	-0.986
PRS_SMALL_BOWL	0.006	0.129	0.009	0.374	-0.257
P_R_R_P	0.033	0.820	0.010	-0.459	-0.161
REC	0.014	0.690	0.022	-0.961	0.451
RPP_LARGE_BOWL	0.008	0.832	0.018	0.886	-0.998
RPP_SMALL_BOWL	0.014	0.531	0.023	0.619	-0.698
RP_GOURD_FLASK	0.003	0.442	0.012	0.990	-1.004
RP_GOURD_JUGLET	0.008	0.550	0.018	-0.245	1.070
RP_JAR	0.041	0.382	0.035	-0.458	0.344
RP_JUG	0.006	0.619	0.020	0.025	1.498
RP_JUGLET	0.008	0.351	0.008	-0.500	0.298
RP_LARGE_BOWLS	0.072	0.112	0.023	-0.173	0.081

Name	Mass	Quality	Inertia	Factor 1	Factor 2
RP_PAN	0.011	0.817	0.013	0.047	0.985
RP_SMALL_BOWL	0.278	0.662	0.035	-0.281	-0.065
RP_SPOUTED_VESSEL	0.003	0.598	0.039	0.834	2.785
SHEEP_GOAT_BONE	0.229	0.569	0.068	0.393	-0.121
WM	0.008	0.704	0.116	-3.021	-0.877
WPP_SMALL_BOWL	0.003	0.598	0.039	0.834	2.785
WSH	0.011	0.003	0.007	0.008	0.042

Name	Factor 1	Factor 2	Name	Factor 1	Factor 2
BLACK_TOPPED_BOWL	0.001	0.007	REC	0.054	0.015
BSC_SMALL_BOWL	0.000	0.003	RPP_LARGE_BOWL	0.027	0.045
CATTLE_BONE	0.013	0.187	RPP_SMALL_BOWL	0.022	0.037
COARSE_WARE_MEALING_BIN	0.016	0.030	RP_GOURD_FLASK	0.011	0.015
COOKING_POT	0.000	0.000	RP_GOURD_JUGLET	0.002	0.052
DEER_BONES	0.085	0.000	RP_JAR	0.036	0.027
GAMES	0.010	0.002	RP_JUG	0.000	0.068
GE	0.003	0.031	RP_JUGLET	0.009	0.004
PBI	0.058	0.044	RP_LARGE_BOWLS	0.009	0.003
PI	0.005	0.009	RP_PAN	0.000	0.058
PIG_BONES	0.021	0.044	RP_SMALL_BOWL	0.093	0.006
PITHOS	0.003	0.004	RP_SPOUTED_VESSEL	0.008	0.117
PRS_LARGE_BOWL	0.005	0.015	SHEEP_GOAT_BONE	0.149	0.018
PRS_SMALL_BOWL	0.003	0.002	WM	0.318	0.035
P_R_R_P	0.029	0.005	WPP_SMALL_BOWL	0.008	0.117
			WSH	0.000	0.000

Table C.34: Column variable contributions to factors for second iteration of Marki *Alonia* CA.

Name	Factor 1	Factor 2
BLACK_TOPPED_BOWL	0.016	0.084
BSC_SMALL_BOWL	0.002	0.071
CATTLE_BONE	0.054	0.593
COARSE_WARE_MEALING_BIN	0.359	0.510
COOKING_POT	0.000	0.003
DEER_BONES	0.673	0.002
GAMES	0.107	0.016
GE	0.017	0.159
PBI	0.287	0.171
PI	0.022	0.031
PIG_BONES	0.256	0.411
PITHOS	0.145	0.132
PRS_LARGE_BOWL	0.087	0.185
PRS_SMALL_BOWL	0.088	0.042
P_R_R_P	0.731	0.089

Name	Factor 1	Factor 2
REC	0.565	0.125
RPP_LARGE_BOWL	0.367	0.465
RPP_SMALL_BOWL	0.234	0.298
RP_GOURD_FLASK	0.218	0.224
RP_GOURD_JUGLET	0.027	0.523
RP_JAR	0.244	0.138
RP_JUG	0.000	0.619
RP_JUGLET	0.259	0.092
RP_LARGE_BOWLS	0.091	0.020
RP_PAN	0.002	0.816
RP_SMALL_BOWL	0.628	0.033
RP_SPOUTED_VESSEL	0.049	0.549
SHEEP_GOAT_BONE	0.520	0.050
WM	0.650	0.055
WPP_SMALL_BOWL	0.049	0.549
WSH	0.000	0.003

Table C.35: Column variable squared correlations with factors for second iteration of Marki *Alonia* CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.777	33.469	33.469
2	0.380	16.342	49.811
3	0.354	15.262	65.073
4	0.253	10.891	75.964
5	0.201	8.663	84.627
6	0.125	5.380	90.007
7	0.107	4.589	94.596
8	0.063	2.710	97.306
9	0.051	2.200	99.505
10	0.011	0.495	100.000

Table C.36: Eigenvalues and percent inertia for ProBA CA.Total inertia: 2.322

Name	Mass	Quality	Inertia	Factor 1	Factor 2
EP10	0.216	0.323	0.124	-0.368	0.222
EP12	0.119	0.180	0.138	-0.444	-0.112
EP13	0.098	0.353	0.084	-0.451	0.315
EP16	0.041	0.050	0.215	-0.488	0.148
EP19	0.155	0.390	0.084	-0.358	0.288
EP21	0.015	0.028	0.073	-0.239	-0.271
EP22	0.015	0.009	0.185	-0.232	-0.236
MP73	0.067	0.148	0.302	-0.205	0.791
MP76	0.062	0.193	0.145	-0.406	-0.537
MT1	0.062	0.907	0.315	-0.244	-2.135
MTTS	0.149	0.998	0.658	2.096	0.025

Table C.37: Row variable coordinates for ProBA CA.

Name	Factor 1	Factor 2
EP10	0.038	0.028
EP12	0.030	0.004
EP13	0.026	0.026
EP16	0.013	0.002
EP19	0.026	0.034
EP21	0.001	0.003
EP22	0.001	0.002
MP73	0.004	0.110
MP76	0.013	0.047
MT1	0.005	0.743
MTTS	0.845	0.000

Table C.38: Row variable contributions to factors for ProBA CA.

Name	Factor 1	Factor 2
EP10	0.236	0.086
EP12	0.169	0.011
EP13	0.237	0.116
EP16	0.046	0.004
EP19	0.236	0.153
EP21	0.012	0.016
EP22	0.005	0.005
MP73	0.009	0.139
MP76	0.070	0.123
MT1	0.012	0.895
MTTS	0.998	0.000

Table C.39: Row variable squared correlations to factors for ProBA CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.088	0.409	0.073	-0.421	0.404
BOWL	0.052	0.993	0.293	2.377	0.041
BS__TEACUP_	0.010	0.993	0.059	2.377	0.041
BS__TEAPOT_	0.010	0.993	0.059	2.377	0.041
CANAANITE_JAR	0.010	0.024	0.070	-0.347	0.206
COARSE_WHEELMADE_AMPHORI	0.005	0.122	0.072	-0.233	1.284
COPPER_ARTIFACTS	0.036	0.226	0.070	-0.006	-0.662
COPPER_PRODUCTION	0.026	0.879	0.258	-0.313	-2.947
EL_LISHT_JUG	0.005	0.993	0.029	2.377	0.041
GRIDDLE	0.026	0.170	0.035	-0.450	0.165
GRINDING_EQUIPMENT	0.103	0.557	0.062	-0.437	0.382
HEARTH	0.021	0.143	0.041	-0.403	0.348
JUGS	0.026	0.909	0.100	1.855	0.290
LIME_FEATURES	0.036	0.268	0.049	-0.440	0.411
LUMPS_OF_UNBAKED_CLAY	0.010	0.993	0.059	2.377	0.041
MYC_III_A_PILGRIM_FLASK	0.005	0.122	0.072	-0.233	1.284
PERCUSSION_INSTRUMENTS	0.093	0.267	0.094	-0.420	0.306
PERSONAL_ORNAMENTS	0.026	0.386	0.067	-0.460	-0.893
PITHOS	0.052	0.753	0.069	0.982	0.222
PRRP	0.093	0.451	0.045	-0.415	-0.220
PWW_CRATER	0.005	0.122	0.072	-0.233	1.284
RECEPTACLES	0.031	0.065	0.175	-0.499	0.343
SPOUTED_BOWLS	0.010	0.856	0.049	1.050	-1.712
TC_FIGURINE	0.005	0.039	0.038	-0.504	-0.183
WEAVING_MATERIAL	0.108	0.425	0.050	-0.438	-0.071
WHETSTONE	0.031	0.123	0.053	-0.444	-0.123
__OF_GAMES	0.077	0.023	0.210	-0.205	-0.145

Table C.40: Column variable coordinates for ProBA CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.020	0.038
BOWL	0.375	0.000
BS__TEACUP_	0.075	0.000
BS__TEAPOT_	0.075	0.000
CANAANITE_JAR	0.002	0.001
COARSE_WHEELMADE_AMPHORI	0.000	0.022
COPPER_ARTIFACTS	0.000	0.042
COPPER_PRODUCTION	0.003	0.590
EL_LISHT_JUG	0.037	0.000
GRIDDLE	0.007	0.002
GRINDING_EQUIPMENT	0.025	0.040
HEARTH	0.004	0.007
JUGS	0.114	0.006
LIME_FEATURES	0.009	0.016
LUMPS_OF_UNBAKED_CLAY	0.075	0.000
MYC_III_A_PILGRIM_FLASK	0.000	0.022
PERCUSSION_INSTRUMENTS	0.021	0.023
PERSONAL_ORNAMENTS	0.007	0.054
PITHOS	0.064	0.007
PRRP	0.021	0.012
PWW_CRATER	0.000	0.022
RECEPTACLES	0.010	0.010
SPOUTED_BOWLS	0.015	0.080
TC_FIGURINE	0.002	0.000
WEAVING_MATERIAL	0.027	0.001
WHETSTONE	0.008	0.001
__OF_GAMES	0.004	0.004

Table C.41: Column variable contributions to factors for ProBA CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.213	0.196
BOWL	0.993	0.000
BS__TEACUP_	0.993	0.000
BS__TEAPOT_	0.993	0.000
CANAANITE_JAR	0.018	0.006
COARSE_WHEELMADE_AMPHORI	0.004	0.118
COPPER_ARTIFACTS	0.000	0.226
COPPER_PRODUCTION	0.010	0.869
EL_LISHT_JUG	0.993	0.000
GRIDDLE	0.150	0.020
GRINDING_EQUIPMENT	0.316	0.242
HEARTH	0.082	0.061
JUGS	0.887	0.022
LIME_FEATURES	0.143	0.125
LUMPS_OF_UNBAKED_CLAY	0.993	0.000
MYC_III_A_PILGRIM_FLASK	0.004	0.118
PERCUSSION_INSTRUMENTS	0.174	0.093
PERSONAL_ORNAMENTS	0.081	0.305
PITHOS	0.716	0.037
PRRP	0.351	0.099
PWW_CRATER	0.004	0.118
RECEPTACLES	0.044	0.021
SPOUTED_BOWLS	0.234	0.622
TC_FIGURINE	0.034	0.004
WEAVING_MATERIAL	0.414	0.011
WHETSTONE	0.115	0.009
__OF_GAMES	0.015	0.008

Table C.42: Column variable squared correlations with factors for ProBA CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.412	33.584	33.584
2	0.244	19.891	53.475
3	0.234	19.093	72.568
4	0.142	11.558	84.126
5	0.101	8.247	92.374
6	0.068	5.582	97.956
7	0.025	2.044	100.000

Table C.43: Eigenvalues and percent inertia for Tier 2 and 4 ProBA CA. Total inertia=1.226

Name	Mass	Quality	Inertia	Factor 1	Factor 2
EP10	0.280	0.477	0.097	-0.324	0.244
EP12	0.153	0.155	0.130	-0.358	0.055
EP13	0.127	0.030	0.074	0.020	-0.131
EP16	0.053	0.787	0.214	0.046	-1.776
EP19	0.200	0.533	0.058	-0.309	0.246
EP21	0.020	0.017	0.099	-0.264	-0.111
MP73	0.087	0.968	0.347	1.924	0.415
MP76	0.080	0.242	0.208	0.514	-0.603

Table C.44: Row variable coordinates for Tier 2 and 4 ProBA CA.

Name	Factor 1	Factor 2
EP10	0.072	0.068
EP12	0.048	0.002
EP13	0.000	0.009
EP16	0.000	0.690
EP19	0.046	0.050
EP21	0.003	0.001
MA73	0.779	0.061
MA76	0.051	0.119

Table C.45: Row variable contributions to factors for Tier 2 and 4 ProBA CA.

Name	Factor 1	Factor 2
EP10	0.305	0.172
EP12	0.151	0.004
EP13	0.001	0.030
EP16	0.001	0.786
EP19	0.326	0.207
EP21	0.014	0.002
MA73	0.925	0.043
MA76	0.102	0.140

Table C.46: Row variable squared correlations with factors for Tier 2 and 4 ProBA CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.113	0.613	0.047	0.432	-0.262
CANAANITE_JAR	0.013	0.728	0.067	1.900	-0.190
COARSE_WHEELMADE_AMPHORI	0.007	0.920	0.070	2.998	0.841
COPPER_ARTIFACTS	0.033	0.029	0.091	-0.242	-0.145
COPPER_PRODUCTION	0.007	0.185	0.077	0.801	-1.221
GRIDDLE	0.033	0.477	0.027	-0.522	0.341
GRINDING_EQUIPMENT	0.133	0.589	0.032	-0.225	0.303
HEARTH	0.027	0.537	0.035	0.837	-0.037
JUG	0.007	0.920	0.070	2.998	0.841
LIME_FEATURES	0.047	0.082	0.038	0.140	0.218
MYC_III_A_PILGRIM_FLASK	0.007	0.920	0.070	2.998	0.841
PERCUSSION_INSTRUMENTS	0.120	0.640	0.067	-0.467	0.371
PERSONAL_ORNAMENTS	0.027	0.512	0.069	-0.061	-1.149
PITHOS	0.033	0.452	0.036	-0.496	0.495
PRRP	0.107	0.162	0.028	-0.097	0.182
PWW_CRATER	0.007	0.920	0.070	2.998	0.841
RECEPTACLES	0.040	0.683	0.166	-0.123	-1.678
TC_FIGURINE	0.007	0.059	0.037	-0.558	0.111
WEAVING_MATERIAL	0.127	0.669	0.031	-0.397	0.079
WHETSTONE	0.040	0.023	0.044	-0.075	-0.141
__OF_GAMES	0.067	0.243	0.053	0.201	-0.390

Table C.47: Column variable coordinates for Tier 2 and 4 ProBA CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.051	0.032
CANAANITE_JAR	0.117	0.002
COARSE_WHEELMADE_AMPHORI	0.146	0.019
COPPER_ARTIFACTS	0.005	0.003
COPPER_PRODUCTION	0.010	0.041
GRIDDLE	0.022	0.016
GRINDING_EQUIPMENT	0.016	0.050
HEARTH	0.045	0.000
JUG	0.146	0.019
LIME_FEATURES	0.002	0.009
MYC_III_A_PILGRIM_FLASK	0.146	0.019
PERCUSSION_INSTRUMENTS	0.064	0.068
PERSONAL_ORNAMENTS	0.000	0.144
PITHOS	0.020	0.034
PRRP	0.002	0.015
PWW_CRATER	0.146	0.019
RECEPTACLES	0.001	0.462
TC_FIGURINE	0.005	0.000
WEAVING_MATERIAL	0.048	0.003
WHETSTONE	0.001	0.003
__OF_GAMES	0.007	0.042

Table C.48: Column variable contributions to factors for Tier 2 and 4 ProBA CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.449	0.165
CANAANITE_JAR	0.720	0.007
COARSE_WHEELMADE_AMPHORI	0.853	0.067
COPPER_ARTIFACTS	0.021	0.008
COPPER_PRODUCTION	0.056	0.130
GRIDDLE	0.334	0.143
GRINDING_EQUIPMENT	0.210	0.380
HEARTH	0.536	0.001
JUG	0.853	0.067
LIME_FEATURES	0.024	0.058
MYC_III_A_PILGRIM_FLASK	0.853	0.067
PERCUSSION_INSTRUMENTS	0.393	0.247
PERSONAL_ORNAMENTS	0.001	0.511
PITHOS	0.226	0.226
PRRP	0.036	0.127
PWW_CRATER	0.853	0.067
RECEPTACLES	0.004	0.679
TC_FIGURINE	0.056	0.002
WEAVING_MATERIAL	0.644	0.025
WHETSTONE	0.005	0.018
__OF_GAMES	0.051	0.192

Table C.49: Column variable squared correlations with factors for Tier 2 and 4 ProBA CA.

Factor	Eigenvalue	Percent	Cum Percent
1	0.267	37.776	37.776
2	0.191	27.111	64.887
3	0.129	18.320	83.206
4	0.086	12.212	95.419
5	0.032	4.581	100.000

Table C.50: Eigenvalues and percent inertia for Episkopi *Phaneromeni* CA. Total inertia=0.706

Name	Mass	Quality	Inertia	Factor 1	Factor 2
EP10	0.336	0.704	0.084	0.199	0.368
EP12	0.184	0.758	0.138	0.259	-0.708
EP13	0.152	0.180	0.093	-0.318	0.097
EP16	0.064	0.946	0.229	-1.836	-0.121
EP19	0.240	0.316	0.043	0.193	0.138
EP21	0.024	0.399	0.120	0.201	-1.394

Table C.51: Row variable coordinates for Episkopi *Phaneromeni* CA.

Name	Factor 1	Factor 2
EP10	0.050	0.238
EP12	0.046	0.482
EP13	0.058	0.008
EP16	0.809	0.005
EP19	0.033	0.024
EP21	0.004	0.244

Table C.52: Row variable contributions to factors for Episkopi *Phaneromeni* CA.

Name	Factor 1	Factor 2
EP10	0.159	0.544
EP12	0.090	0.669
EP13	0.165	0.015
EP16	0.942	0.004
EP19	0.209	0.107
EP21	0.008	0.390

Table C.53: Row variable squared correlations with factors for Episkopi *Phaneromeni* CA.

Name	Mass	Quality	Inertia	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.096	0.930	0.046	-0.523	0.413
COPPER_ARTIFACTS	0.032	0.785	0.103	0.442	-1.528
GRIDDLE	0.040	0.481	0.020	0.430	-0.248
GRINDING_EQUIPMENT	0.152	0.586	0.018	0.190	0.184
HEARTH	0.016	0.051	0.027	-0.121	0.268
LIME_FEATURES	0.048	0.172	0.038	0.087	-0.361
PERCUSSION_INSTRUMENTS	0.144	0.424	0.043	0.339	0.105
PERSONAL_ORNAMENTS	0.024	0.665	0.076	-0.850	-1.171
PITHOS	0.040	0.736	0.030	0.381	0.631
PRRP	0.104	0.457	0.030	0.334	0.145
RECEPTACLES	0.048	0.938	0.158	-1.754	0.091
TC_FIGURINE	0.008	0.648	0.035	0.502	-1.619
WEAVING_MATERIAL	0.152	0.134	0.006	0.042	0.056
WHETSTONE	0.032	0.519	0.011	0.412	0.095
__OF_GAMES	0.064	0.379	0.065	-0.469	-0.407

Table C.54: Column variable coordinates for Episkopi *Phaneromeni* CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.099	0.085
COPPER_ARTIFACTS	0.023	0.390
GRIDDLE	0.028	0.013
GRINDING_EQUIPMENT	0.021	0.027
HEARTH	0.001	0.006
LIME_FEATURES	0.001	0.033
PERCUSSION_INSTRUMENTS	0.062	0.008
PERSONAL_ORNAMENTS	0.065	0.172
PITHOS	0.022	0.083
PRRP	0.043	0.011
RECEPTACLES	0.554	0.002
TC_FIGURINE	0.008	0.110
WEAVING_MATERIAL	0.001	0.002
WHETSTONE	0.020	0.002
__OF_GAMES	0.053	0.056

Table C.55: Column variable contributions to factors for Episkopi *Phaneromeni* CA.

Name	Factor 1	Factor 2
ARCHITECTURAL_FEATURES	0.573	0.356
COPPER_ARTIFACTS	0.061	0.724
GRIDDLE	0.361	0.120
GRINDING_EQUIPMENT	0.303	0.283
HEARTH	0.009	0.043
LIME_FEATURES	0.009	0.163
PERCUSSION_INSTRUMENTS	0.387	0.037
PERSONAL_ORNAMENTS	0.229	0.435
PITHOS	0.197	0.539
PRRP	0.384	0.073
RECEPTACLES	0.935	0.003
TC_FIGURINE	0.057	0.591
WEAVING_MATERIAL	0.049	0.085
WHETSTONE	0.493	0.026
__OF_GAMES	0.216	0.163

Table C.56: Column variable squared correlations with factors for Episkopi *Phaneromeni* CA.