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Characterizing the chipped stone from Kritou Marottou Ais Yiorkis, Cyprus: Investigations into the Cypro-Ppnb

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CHARACTERIZING THE CHIPPED STONE FROM KRITOU MAROTTOU *AIS YIORKIS*, CYPRUS: INVESTIGATIONS INTO THE CYPRO-PPNB

by

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ABSRACT

Characterizing the Chipped Stone from Kritou Marottou *Ais Yiorkis*, Cyprus: Investigations into the Cypro-PPNB

by

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Kritou Marottou *Ais Yiorkis* represents the Middle Cypro-Pre-Pottery Neolithic B, a formative period in the prehistory of Cyprus. Many other aspects of the site lend to its significance, including the sites inland, upland location, presence of cattle, anomalous architecture, interesting botanical assemblage, and consistent yet distinctive chipped stone assemblage. The chipped stone from *Ais Yiorkis* was employed to examine economic choices and site use patterns. An overall characterization describes the assemblage, providing baseline data. Research questions investigate artifact variation, intra-site distribution, and inter-site comparison. The results have proven the assemblage to be contemporary, revealed a low degree of variation, very regular intra-site distribution, and the systematic use of a distinctive, possibly site specific technology. The significance of the chipped stone economy specifically and the site more broadly do not stand alone, but in fact document a period in the prehistory of Cyprus that has until now been largely undefined.

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For the never ending supply of unconditional love and unknowing support I dedicate this thesis to Layne Cooper Yanvari.

CHAPTER 1

INTRODUCTION

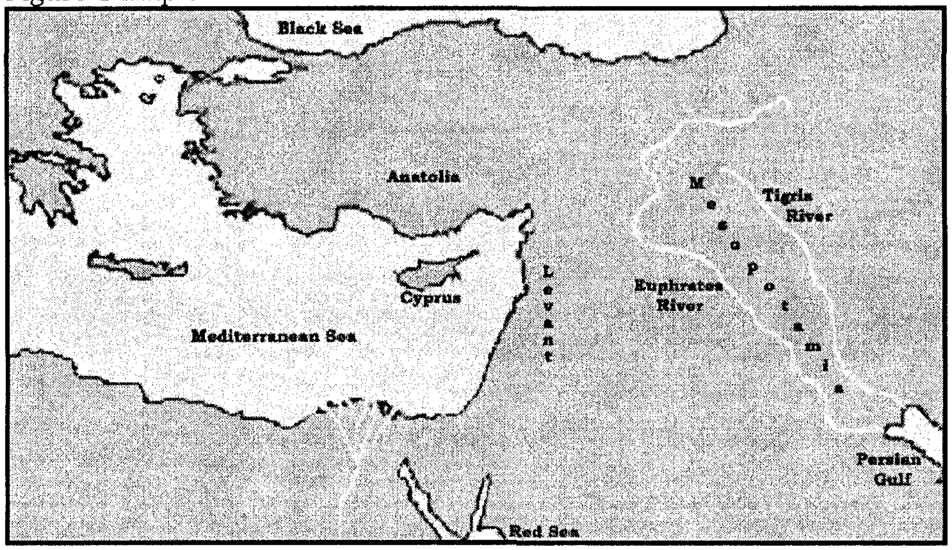
1.1 Research Context

Archaeological investigations into the Late Holocene of the Near East have revealed a great deal about the Neolithic Revolution, the transition from mobile hunter/gatherers to agriculturalists and the development of settled villages (Simmons 2007). In particular, such research has exploded in relation to the Mediterranean island of Cyprus in recent years. The earliest inhabitants of Cyprus most likely emigrated from either the Levantine or Anatolian coasts (see Figure 1) (Guilaine et al. 2000, Peltenburg et al. 2001a). Neolithic sites in Cyprus and those on the Levantine mainland are similar in some ways and disparate in others. The Cypriot Neolithic demonstrates the importation of culture, technology and economy (i.e., fauna, flora, raw materials, etc.), the adoption of selected aspects, and the decision to implement change. The establishment of permanent settlements in Cyprus is significant in Near Eastern prehistory as the desire to inhabit new land may be indicative of changing environments and/or culture on the mainland (Peltenburg et al. 2001a, Simmons 2007: 229-263).

The early prehistory of Cyprus has been largely rewritten as a result of a number of revolutionary discoveries. The initial occupation of the island was pushed back at least 3,000 years with the documentation of Akrotiri *Aetokremnos*, a Pre-Neolithic site dating to 12,000-11,500 cal. BP (10,000-9500 cal. BC) (Simmons 1999, Simmons 2007). The gap between the earliest occupation and the well-established Aceramic Neolithic Khirokitia Culture (hereafter KC), which started at ca. 9000/8500 cal. BP (7000 cal BC), is in the process of being bridged. The Cypriot Aceramic Neolithic has been greatly expanded with recent discoveries, defining a pre-Khirokitian phase, generally referred to as the Cypro-Pre-Pottery Neolithic B (hereafter CPPNB) as well as a possible Pre-Pottery Neolithic A (CPPNA) (Peltenburg et al. 2000, Guilaine et al. 2000, McCartney et al. 2006, 2007). Significantly, the CPPNB shows more similarities to the mainland Neolithic, primarily in terms of some chipped stone attributes, than does the KC. Questions of length and continuity of occupations are beginning to be answered, as well as questions related to culture and culture change.

The Aceramic Neolithic site of Kritou Marottou *Ais Yiorkis*, which is the focus of this thesis, represents yet another site that is contributing to current knowledge. Chronologically, Kritou Marottou *Ais Yiorkis* appears to fall within the Middle CPPNB. Materials recovered from the site include ornamental or symbolic artifacts, faunal remains, shell, botanical remains, ground stone, and chipped stone. The chipped stone assemblage is by far the most extensive, and is analyzed and discussed here in order to characterize the site of *Ais Yiorkis* and to further expand and explain the context of the site within the prehistory of Cyprus. Overall, in the case of Cyprus, the Cypro-PPNB in general is still considered "new", and the Middle CPPNB in particular is largely "undefined"; therefore the characterization of a site such as that of *Ais Yiorkis* here will establish necessary and previously unavailable baseline data for the chipped stone of this period.

Figure 1 Map of the Near East.



Specialists have been studying chipped stone technology and typology in archaeological contexts for decades. Chipped stone is arguably the most commonly recovered artifact from prehistoric sites, and therefore offers a great deal of insight into the past. Such assemblages have the potential to reveal processes involved in the procurement of raw materials, core reduction, tool formation, tool use, and discard. Chipped stone analyses can also provide information on activities that convey site use and can be used to cross examine technology between populations.

Some archaeologists deny the importance of typology and feel that by typing an artifact we are ourselves giving it a purpose, based on our own vision of the world, and are limiting analyses with subjective interpretive categories (e.g., Sullivan and Rozen 1985). The validity of typological classification is undeniably a very important consideration in chipped stone analyses. Debates of typological validity come from two general differential opinions. One side of the debate argues that types are "inherent" in the artifacts (emic), while the other side argues that types are "invented" by the researchers (etic) (Kooyman 2000, Spaulding 1953, Ford 1954). Although these views are opposing, researchers on both sides develop and employ typologies. The typologies used may even be the same, but the meanings behind those typologies differ (see Bordes

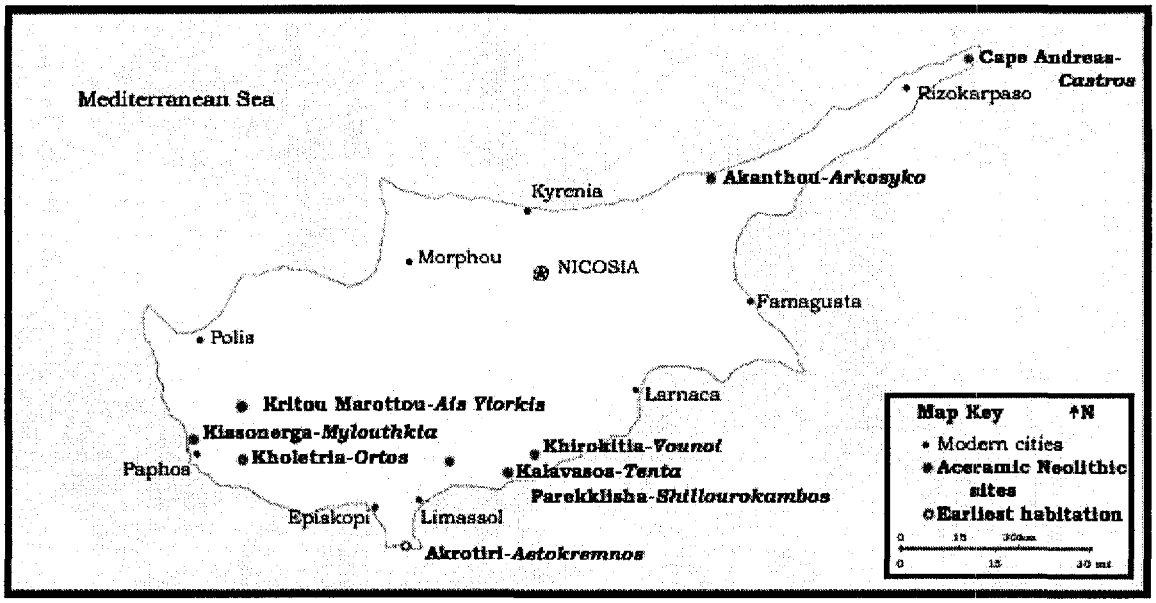
1961, 1968, Bordes and de Sonneville-Bordes 1970, Binford and Binford 1966, 1969). Experimental and ethnoarchaeology work on the "inherent" side of the debate, successfully demonstrating that artifacts have actual (opposed to perceived) functions. The view subscribed to here favors an emic/inherent nature to chipped stone artifacts and corresponding typologies.

Archaeologists and lithic analysts have devoted a great deal of time and energy developing accurate, verifiable, and useful typologies and classificatory systems, confirmed through flint knapping studies, experimental archaeology, and use wear analysis (Leakey 1954, Bordes and Crabtree 1969, Whittaker 1994, Andrefsky 1998, Hayden 1979). The use and definitional clarification of one's classification, typology and terminology are very important in such analyses for the communication of information between not only researchers, but others interested in learning about the past. Chipped stone analyses in particular, are important because they allow archaeologists to examine many aspects of a population's economy and culture, moving us ever closer to a peopled past.

The chipped stone assemblage examined here, recovered through four seasons of excavation at the site of Kritou Marottou *Ais Yiorkis* (hereafter *Ais Yiorkis*, see Figure 2), includes 51,240 artifacts, although continued excavations through 2008 have increased the site's assemblage to nearly 200,000 pieces. This impressive assemblage makes *Ais Yiorkis* ideal for detailed analyses. The assemblage plays quite a significant role in the establishment of the site's integrity related to both disturbance and continuity to be discussed later, and is therefore incredibly valuable.

Many other aspects of *Ais Yiorkis* have proven to be uncharacteristic of typical Cypriot Aceramic Neolithic villages, adding to the significance of the site. The location of the site, inland and upland, is notable as the vast majority of CPPNB sites are coastal or lowland. The primary architectural feature, a circular stone platform, excavated at *Ais Yiorkis* related to the 1997-2004 excavations remains quite anomalous, as nothing similar has ever been documented in Cyprus. The faunal assemblage also sets *Ais Yiorkis* apart from other Neolithic sites, as only two other Aceramic Neolithic sites (Parekklisha *Shillourokambos* and Akanthou *Arkosyko*) have been found to contain the remains of *Bos* (Vigne 2001, Sevketoglu 2002, Frame 2002, Martin 2000). Finally, the radiocarbon dates (ca. 7500-8000 cal BC) recovered thus far have revealed that *Ais Yiorkis* was occupied at a formative time in Cypriot prehistory, further adding to the site's significance.

Figure 2 Map of Cyprus showing well-documented Aceramic Neolithic site locales.



1.2 Research Design

The primary goal of this research is to provide a detailed descriptive typo-technological characterization of the chipped stone assemblage recovered from *Ais Yiorkis* (see Table 1). Such analyses have traditionally been overlooked in Cypriot archaeological investigations. Until relatively recently the Neolithic of Cyprus in general was considered "culturally retarded" ("in a purely temporal sense"), and chipped stone assemblages in particular were considered simplistic and uninteresting and were largely ignored (Held 1993: 30). Comprehensive lithic analyses are therefore not only important, but are necessary to establish a precedent for the treatment of chipped stone in all archaeological assemblages recovered in Cyprus. Again, in the case of *Ais Yiorkis* and its probable location within the Middle CPPNB, the ability to present baseline data related to such a large assemblage possibly and seemingly representing a "new" culture is quite significant. Notably, Cypriot archaeologist and lithic specialist Carole McCartney has made great strides and has been integral to the direction of current chipped stone studies on the island, although none have been presented in such an extensive format as this (McCartney and Todd 2005, McCartney 2004, McCartney and Gratuze 2003).

Overall, this research seeks to provide a highly detailed characterization that not only describes and interprets the *Ais Yiorkis* assemblage, but offers both a format and a comprehensive analysis providing data that can be used for future analyses and comparative work. This basic characterization determines to answer a variety of questions related to site use and economy. Research questions looking at more specific topics related to the chipped stone assemblage and what it reveals about the site are explored and discussed. The primary avenues of inquiry include: 1) An examination of the chipped stone assemblage looking specifically at variation seen within the artifacts recovered from *Ais Yiorkis*. 2) An intra-site distribution focusing on how the production, use and discard of chipped stone artifacts varied across the site. 3) An inter-site comparison looking at the greater context of *Ais Yiorkis*, specifically addressing the site of Kalavasos *Tenta*, a well-documented Cypriot Neolithic site, allowing for a broader examination and better understanding of *Ais Yiorkis* within the context of the Cypriot Aceramic Neolithic at large (see Table 1). The primary objective of this analysis seeks to further understand and interpret what the chipped stone assemblage tells about the site and its people's lives and economic choices.

Table 1 Primary research avenues.

	Chipped stone description and site characterization.
1	Examination of internal artifact variation, site function and economy.
2	Intra-site contextual analysis of distribution.
3	Inter-site comparison and contextualization.

Specifically, variation in the assemblage is investigated in order to gain an understanding of the economic and technological choices being made related to raw material procurement and flintknapping at *Ais Yiorkis*. Internal artifact variation will focus on the types of chipped stone artifacts recovered from the site and how they relate to economy. Tools recovered from archaeological contexts are often representative of the activities that were practiced there. The tools will be examined in order to determine whether or not they can inform on site use and economy. Although formal tools are important when looking at site function, the entire assemblage or available *chaînes opératoire* will be assessed to look at the various aspects of the lithic reduction sequence that occurred and what they can tell us about economics. While examining the site's function through chipped stone analyses, other aspects of the population's economy will also be evaluated. Economy is defined as the way in which a population manages its resources. In terms of chipped stone, economy here represents raw material collection and use, as well as technological decision making related to core reduction and tool production, discard, disturbance and other processes. Site function strongly relates to the economic strategies utilized by the inhabitants. Faunal and botanical remains recovered from the site will be discussed in minimal detail in terms of how they relate to chipped stone tools and economy.

By examining and asking questions related to the distribution of chipped stone throughout the site, site function and economy are investigated and inferred. Analyses examining distribution focus primarily on the layout of the site by units, but levels are also discussed when possible. This distribution analysis will inquire about the effects of plowing and modern activities, discard and distribution patterns, and will identify densely distributed areas in order to determine if specialized activity areas or distinct heavily utilized areas exist. A midden found to be surrounding and seemingly associated with the stone platform (Feature 1), will be discussed in detail. These data may allow us to interpret uses of Feature 1. The contextual analysis of chipped stone will also be used to examine disposal and breakage patterns. The quantity and type of chipped stone artifacts recovered will be discussed according to the unit and level from which they were excavated. This contextual analysis of the chipped stone assemblage will also allow for the investigation of possible functions of the site as a whole, as well as possible functions of specific areas.

This analysis will also examine inter-site variation and the issue of context and contemporaneity. Lithic analyses will be used to further contextualize *Ais Yiorkis* within the Cypriot Aceramic Neolithic. Because of the apparent formative position of *Ais Yiorkis*, this analysis will evaluate whether the assemblage is more similar to the newly defined CPPNB, or if it is more characteristic of the assemblages associated with later Aceramic Neolithic sites (i.e., KC). In order to determine which suite of sites (early/late) *Ais Yiorkis* most closely resembles diagnostic artifacts or "type fossils" and technology will be identified for comparison with those of both early and later Aceramic Neolithic sites. This portion of the analysis will be conducted through the examination of the established chronological sequence available from Kalavasos *Tenta*. *Tenta* proves to represent the best choice for comparative analysis for a variety of reasons, including the broad time span and well-established chronology, along with the detailed availability of published results (McCartney and Todd 2005). Other CPPNB sites while having significant chipped stone assemblages are not as chronologically defined with multiple identifiable periods and/or are not well published or are not presented in detail suitable to facilitate comparison. The chronology for *Tenta* has recently been reevaluated and examined based on traditional dating techniques as well as chipped stone analyses identifying differential assemblages (McCartney and Todd 2005). Comparing the *Ais*

Yiorkis assemblage to that of *Tenta* will not only allow *Ais Yiorkis* to take its place chronologically, but will also demonstrate how and if the site fits within the greater Cypro Aceramic Neolithic trend.

1.3 Framework

The framework of this thesis is as follows. Chapter 2 provides a general introduction of Cypriot prehistory, beginning with the earliest occupation of the island in the Holocene, and ending with more detailed discussions of Aceramic and Pottery Neolithic settlements and chronology. Chapter 3 introduces the Aceramic Neolithic site of *Ais Yiorkis*, and provides background information on geography and ecology, as well as details about the various artifact assemblages recovered from the site. Chapter 4 focuses on the methodology employed in both field and laboratory settings, detailing excavation techniques, artifact collection, and lithic analyses and typologies. Chapter 5 examines the chipped stone recovered from *Ais Yiorkis*, providing a concise characterization of the assemblage. In Chapter 6 the three primary research questions looking at artifact variation, intra-site artifact distribution and site function, inter-site comparison and contextualization, outlined above are developed and discussed, and the results of the posed questions are presented. Chapter 7 concludes the investigation with final discussion and summarization of the research results, and contemplates areas of further study.

CHAPTER 2

THE CYPRIOT NEOLITHIC IN CONTEXT

2.1 The Environment and Resources of Cyprus

At 9,251 km2 (3,572 m2), Cyprus is the third largest of the Mediterranean islands, located in the eastern Mediterranean Sea, 70km south of Anatolia, modern Turkey, and 95km west of the mainland Levantine coast, specifically modern Syria (Knapp et al. 1994). Mt. Olympus, within the Troodos mountain range, represents the highest elevation in Cyprus at 1,951 meters above sea level. The Troodos massif, the primary mountain range in Cyprus, was geologically formed during the Upper Cretaceous of the Mesozoic on an oceanic ridge in the Tethys Ocean. The island did not emerge from the sea until the European and African plates collided and the African plate underthrust the European in the Miocene (Stanley Price 1979, Gass 1968). Geographically, four major zones exist that include, from southwest to northeast, the low-lying coastal belt, the Troodos massif, the Mesaoria plain, and the Kyrenia (Pentadaktylos) mountains (Steel 2004). The site of Kritou Marottou *Ais Yiorkis* is found on the edge of the coastal belt zone, in the foothills, closely bordering the Troodos massif. Geomorphologically, the Troodos and Kyrenia mountain ranges create steep slopes, deep valleys and broad flood plains. Overall, Cyprus displays a great deal of topographical variation (Stanley Price 1979). The geography in the immediate proximity of *Ais Yiorkis* is no exception, as it includes hills and valleys, with streams, rivers, and springs in relatively close proximity.

The broader environment of Cyprus is characterized by a semi-arid Mediterranean climate with hot, dry summers and cool, wet winters. Unfortunately research dealing with the Cypriot paleoenvironment at large is currently lacking. Through the extrapolation of rainfall and pollen data the climate of Neolithic Cyprus is largely believed to have been similar to that of today (Stanley Price 1979, Butzer 1975). Cyprus is thought to have been generally comparable to the Holocene "fluvial histories" recorded elsewhere in the Mediterranean (Vita Finzi 1969, Stanley Price 1979). Fluctuations in precipitation, temperature, and aridity are recognized to have occurred variously since the Holocene. Of the small amount of rainfall that Cyprus receives, more than 80% occurs in the winter months between November and March (Stanley Price 1979, German Water Mission 1965). Although river courses have not changed very much since the Holocene, there have been changes in size, as well as drainage and deposition patterns (Christodhoulou 1959, Stanley Price 1979).

The early Holocene vegetation of Cyprus is generally described as Mediterranean, in that Mediterranean evergreen sclerophyllous forests of cypress, oaks, and juniper are thought to have blanketed the island (Stanley Price 1979). In characterizing prehistoric vegetation, extant species have provided a great deal of information, but pollen analyses and the study of fossilized and carbonized plant remains provide much more direct evidence and more reliable results. The analysis of pollen samples collected from Khirokitia for example revealed high amounts of herbaceous pollen and low amounts of arboreal pollen (Renault-Miskovsky 1989).

Neolithic populations inhabiting Cyprus spent a great deal of time and energy building a suitable economic base for their survival. The island's only significant economically endemic fauna, pygmy hippopotamus (*Phanourios minutus*) and pygmy elephant (*Elephas cypriotes*), became extinct around 12,000 years ago, during the earlier Akrotiri Phase (Simmons 1999). Neolithic people were forced to import the faunal species that they felt were necessary for survival and/or comfort (Watson and Stanley Price 1977). The transplanted Neolithic fauna have been identified archaeologically, and include fallow deer (*Dama mesopotamica*), pig (*Sus scrofa*), sheep (*Ovis orientalis*), goat (*Capra aegagrus*), and, more recently documented, cattle (*Bos primigenius*), previously unknown prior to the Bronze Age (Davis 1984, 1989, Croft 1991, Guilaine et al. 2000, Peltenburg et al. 2001b, Vigne 2001). Based on the domestic status of contemporary mainland pig, goat, and sheep it can be inferred that these animals were domestic at the time of import to Cyprus. The Mesopotamian fallow deer appear to have been imported to the island as fully wild animals that were transported and then released, and would probably have been exploited through a herd-management strategy (Croft 1991). A number of non-economic species were also identified as having been introduced to the greater ecology of Cyprus during the Neolithic, including, dog (*Canis familiaris*), cat (*Felis lybica*), fox (*Vulpes vulpes*), and the house mouse (*Mus musculus domesticus*). Indigenous animal species that have been identified within Aceramic Neolithic faunal assemblages include snakes, lizards, frogs, toads, hedgehogs, hare, shrews, and birds (Peltenburg et al. 2001b, Croft 1991, Held 1992, Cucchi et al. 2002).

The recovery of botanical remains from a number of Aceramic Neolithic sites has revealed the importation of botanicals to Cyprus as well. Neolithic peoples introduced a number of non-indigenous flora pandemonium species to Cyprus in order to maintain their subsistence base. The Cypriot Aceramic Neolithic botanical assemblage includes a suite of domesticates, including einkorn wheat (*Triticum monococcum*), emmer wheat (*Triticum dicoccum*), and barley (*Hordeum vulgare*). Emmer wheat, einkorn wheat, and barley are known to have been brought to Cyprus as fully domesticated species as no wild progenitor species have been identified (Hansen 2001, Colledge 2004, Zohary 1996). Interestingly, wild barley is native to Cyprus, but has not been documented in archaeobotanical assemblages (Meikle 1985, Zohary and Hopf 2000). Lentil (*Lens culinaris*), peas (*Pisum sativum*), fig (*Ficus* sp.), vetch (*Vicia* sp.), bitter vetch (*Vicia ervilia*), olive (*Olea* sp.), and pistachio (*Pistacia* sp.) are among the greater botanicals that constituted the Aceramic Neolithic floral diet (Hansen 2001, Colledge 2004, Willcox 2001, Zohary 1996).

2.2 Cyprus in Context

2.2.1 Mainland Connections

In order to discuss local developments at *Ais Yiorkis* it is important to consider the site's context within the Cypriot Aceramic Neolithic as well as within the Neolithic of the greater Near East, which includes the Levant, Syria, southeastern Turkey and northern Iraq. The Aceramic Neolithic of the Near East spans from ca. 10,500 to 7500 BP and generally arose out of the preceding Natufian (ca. 12,800 to 10,200 BP) (Simmons 2007). The Aceramic Neolithic is known for a number of specific developments including the efflorescence of permanent settled villages, agriculture, and domestication of animals, increasing populations, and the colonization of new territories.

The mainland Neolithic is generally divided into the Aceramic or Pre-pottery period and the Ceramic or Pottery period. The Aceramic Neolithic, which is of primary concern in this research, has been subdivided into the Pre-pottery Neolithic A (PPNA), the Pre-pottery Neolithic B (PPNB) and the Pre-pottery Neolithic C (PPNC), based on distinctions in settlement type, architecture, and stone tools among other things (Bar-Yosef and Bar-Yosef Mayer 2002, Kuijt and Goring-Morris 2002, Peregrine and Ember 2002, Banning 1998, Simmons 2007).

The events characteristic of this period are generally referred to collectively as the "Neolithic Revolution" (Childe 1951). The shift to a largely agricultural subsistence, where great amounts of time and energy were expended in the domestication and farming of crops, is considered the impetus for many of the other developments that occurred during this period. Among the earliest domesticated plants in the Near East are barley, emmer wheat, einkorn, peas and lentils. Following the domestication of plants came the domestication of animals, including goats, pigs, sheep, and cattle (Banning 1998). The domestication of plants and animals and the shift to farming and husbandry brought about changes in tool production and utilization. New tools were adopted including sickles for use in harvesting, stone grinding slabs for processing, and stone containers and facilities for storage (Peregrine and Ember 2002). All of these events mark a revolutionary stage in subsistence, transitioning from procurement (or hunting and gathering) to production, hence the Neolithic Revolution.

Aceramic Neolithic villages were generally characterized by their variable size, significant architectural features, and permanence of occupation. Architecture was constructed from pisé, mud-brick and/or stone, with round structures (PPNA) replaced by rectangular ones (PPNB) over time. The availability of secure food resources, along with the sedentary nature of the settlements facilitated increasing populations. Increasing populations encouraged the exploration and colonization of new territories (Peregrine and Ember 2002, Banning 1998).

Where does Cyprus fit within this context? While the first mainlanders to explore Cyprus were the pre-Neolithic peoples documented at Akrotiri *Aetokremnos* (Simmons 1999), the Aceramic Neolithic undoubtedly marks the earliest period of actual colonization of the island. Traditionally, the first population believed to inhabit Cyprus was the late Neolithic Khirokitia Culture (9000/8500-7800/7500 cal. BP), which showed no links to the mainland. In recent years, however, new excavations have documented earlier Aceramic Neolithic sites that show some parallels to mainland PPNB and perhaps PPNA sites (e.g., the presence of wells, chipped stone assemblage attributes, and even specific mortuary practices) (Peltenburg 2004: 3). Thus the chronology of the Cypriot Neolithic has been reestablished to reflect the connection. The earliest Aceramic Neolithic of Cyprus has been designated as the Cypro-Pre-Pottery Neolithic B or CPPNB reflecting new discoveries showing mainland links (Peltenburg et al. 2000, 2001a, Peltenburg 2004, Bar-Yosef 2001). The CPPNB is followed by the Pre-Pottery Neolithic Khirokitia Culture (KC) which represents a much more idiosyncratic development, and then the Pottery Neolithic.

2.2.2 The Earliest Prehistory of Cyprus

There has been great debate about the earliest prehistory of Cyprus. Such debates generally revolve around the island's first inhabitants and the nature of their tenancy. Whether or not Cyprus was truly colonized (occupied) by the first inhabitants or merely visited (utilized) for a finite period of time before abandonment is a key issue that offers insight to the subsequent history of the island (Cherry 1990, Simmons et al. 1999, Bunimovitz and Barkai 1996, Simmons 1996, Swiny 2001). The date of first contact with the island has also undergone much debate. Until relatively recently, it was widely accepted that the Khirokitia Culture (KC), named for the type site Khirokitia *Vounoi*, represented the earliest occupation and/or settlement on Cyprus (Dikaios 1953, Stanley Price 1977b, Le Brun 1984, Knapp et al. 1994). Upon discovery, Khirokitia became the earliest known archaeological site on the island, thus, despite some claims to the contrary, most prehistorians were convinced that the island was not inhabited until late in the Aceramic Neolithic (9500 cal. BP).

Investigations into the earliest prehistory of Cyprus changed dramatically with the identification of Akrotiri *Aetokremnos* as an early or pre-Neolithic occupation (Simmons 1999). More recent survey, collection and analyses focusing on coastal aeolianite formations, at Nissi Beach and Aspros, by Ammerman, Sorabji, Noller and McCartney have located and identified chipped stone artifacts that differ from typical Aceramic Neolithic assemblages and have been interpreted as "pre-Neolithic." Research at these sites is ongoing with formal excavations looking to secure radiocarbon dates, and further research focusing on underwater deposits off the coasts of the sites is also being conducted (Ammerman 2005, Ammerman and Noller 2005, Ammerman and Sorabji 2005, Ammerman et al. 2006, 2007).

Akrotiri *Aetokremnos* currently stands as the earliest known habitation site on the island of Cyprus, dated to ca. 12,000-11,500 cal. BP. The site, located on the coast of the Akrotiri Penninsula in southern Cyprus, represents a limited occupation focused around a coastal rock shelter in which material culture was found interspersed with marine shell and the remains of Pleistocene fauna. The site's inhabitants exploited the island's endemic fauna, including *Phanourios minutus* (pygmy hippopotamus) and to a lesser extent, *Elephas cypriotes* (pygmy elephant). Akrotiri's assemblage included chipped and ground stone artifacts in context with pygmy hippopotamus bones, some of which had been burned. The nature of the Akrotiri assemblage along with the disappearance of the animal around the same time has led to the theory of a human-induced extinction (Simmons 2001, 1999, Reese 1996). Alternative interpretations for animal extinctions are offered, such as changes in climate and/or (hippo-induced) habitat destruction (Diamond 1984, Burney 1993). Controversy still plagues the *Aetokremnos* initial occupation/hippo-hunter interpretation with ongoing dialogue continuing to make headlines (Simmons and Mandel 2007, Ammerman 2007).

Excavations at Akrotiri revealed a lithic assemblage previously unknown in prehistoric Cyprus, consisting of over 1,500 pieces, with a variety of tools (totaling 128) including thumbnail scrapers, scrapers, burins, backed pieces, truncations, unifaces, multiple tools, and microliths. Thumbnail scrapers are considered to be the most diagnostic tool type, and are characteristically small in size with regular invasive scraper retouch at the tools end. The ground stone assemblage includes pebbles, cobbles and artifacts. Of the 87 ground stone pieces, only 5 were identified as worked artifacts, while 68 were simply cobbles and 14 were pebbles. Other artifacts were recovered such as worked bone, stone ornaments, and a pierced disk made of calcarenite. A total of 11 features were identified at Akrotiri, primarily hearths, but also shell concentrations, burnt faunal concentrations, a bell-shaped pit, an activity area, and an ash heap. The faunal assemblage was very well preserved, and consists of approximately 218,000 pieces, including pygmy hippopotamus remains of 505+ individuals, 75 individual birds, 3 pygmy elephant individuals, and 21,500+ marine shell individuals among others. Despite the preservation of skeletal materials, no paleobotanical remains were recovered (Simmons et al. 1999).

Overall, the discoveries made at Akrotiri opened the doors for an earlier prehistory of the island, and have paved the way for further research into pre-Khirokitian cultures. Investigations over the past decade or so have documented an early CPPNB occupation (Peltenburg et al. 2000, Guilaine 2000 et al.) and even more recently a probable CPPNA occupation (McCartney et al. 2005, 2007), all pre-dating the KC. Chronologically, *Ais Yiorkis* spans this period of early occupation into the early KC.

2.3 Chronology of the Cypriot Neolithic

Cyprus has been occupied for over 12,000 years. The chronology of the earliest prehistory is still being developed and refined with new discoveries adding to the traditional sequence (Table 2). Akrotiri *Aetokremnos*, as the only solidly dated pre-Neolithic archaeological site in Cyprus, represents the earliest phase in Cypriot prehistory, known as the Akrotiri Phase. Contemporary research, involving survey and excavations at Ayia Varvara *Asprokremnos* and other sites have revealed a probable Cypro-Pre-Pottery Neolithic A Phase with fine projectile points and highly sophisticated core technology reminiscent of mainland chipped stone production, although dates have yet to be announced (McCartney 1998, McCartney et al. 2006, 2007). Based on current available knowledge of the Cypriot Aceramic Neolithic, and new discoveries, the earliest well-dated evidence of Neolithic material culture occurs at Parekklisha *Shillourokambos* and Kissonerga *Mylouthkia* (Guilaine 2000 et al., Peltenburg et al. 2000). Since and due in part to the discoveries of *Shillourokambos* and *Mylouthkia*, a newly designated Cypro-Pre-Pottery Neolithic B, or CPPNB phase, was proposed (Peltenburg et al. 2000, 2001b). Excavations at *Shillourokambos* and *Mylouthkia* identified and solidified the presence of an early Aceramic Neolithic on Cyprus, allowing other sites to be evaluated or reevaluated in a different context. Kalavasos *Tenta* and Akanthou *Arkosyko* (Tatlisu-*Çiftlikduzu*) have since been identified as early CPPNB sites (Todd 2005, Sevketoglu 2000, 2002). The identification of these early Aceramic Neolithic sites has helped to bridge the gap between the Akrotiri Phase and the KC, although many aspects of this period remain unexplained. For example, it is unknown when the CPPNB "begins," as until recently it was unknown to exist at all.

The CPPNB has been divided into Early, Middle and Late phases based on dating and differential artifact assemblages, and is followed by the Khirokitia Culture Period, which designates the late or final Aceramic Neolithic of Cyprus, and is estimated to have lasted from 7000 to 5500 cal. BC. Just as the period between the occupation of Akrotiri and the earliest Aceramic Neolithic is unknown, there remains contention as to what occurred between the Aceramic Neolithic and the Ceramic Neolithic. Following the Aceramic Neolithic KC is an apparent gap of 500 to 1,000 years in the archaeological record preceding the earliest known Ceramic Neolithic, Sotira Culture (Steel 2004). The Sotira Culture period is, like the KC, named for the type site of Sotira *Teppes* and lasted until Chalcolithic technology came into use around 4000 BC (Dikaios 1961, Steel 2004).

Table 2 Chronological sequence of early Cypriot prehistory (adapted from Simmons 2007).

Archaeological Period	Cypriot Culture Period	Phase	Dates cal. BP	Dates cal. BC
"Pre-Neolithic"	Akrotiri		?12,000-11,500	10,050-9550
Aceramic Neolithic	Cypro-PPNA?		?11,500-10,500	9550-8550
Aceramic Neolithic	Cypro-PPNB	Early	?10,500-10,200	?8550– 8250
Aceramic Neolithic	Cypro-PPNB	Middle	10,100-9500	8150-7550
Aceramic Neolithic	Cypro-PPNB	Late	9500-9000	7550-7050
Aceramic Neolithic	Khirokitia		9000/8500-7800/7500	7050-5550
Aceramic/Ceramic	Gap		7500-6900	5550-4950
Ceramic Neolithic	Sotira		6900/6500-5900/5700	4950-3750

2.4 The Aceramic Neolithic

As the Aceramic or Pre-Pottery Neolithic period in Cyprus is still plagued with many unknowns, current research continually augments our knowledge, adding to the significance of this period of Cypriot prehistory. Current excavations are doing much to alleviate this problem, although many of the recent discoveries have actually created more questions than they have answered. The Aceramic Neolithic is characterized by the development of settled villages, a concentration on the initial and early domestication of plants and animals, a focus on lithics in the form of chipped stone and ground stone tools, and a lack of pottery. The following represents a literature review of the key Aceramic Neolithic sites, providing background information as well as specific details about pertinent artifacts and site features. The sites are listed chronologically beginning with the earliest known Aceramic Neolithic site, and ending with the latest known sites in the KC, followed by a short review of the Ceramic Neolithic.

2.4.1 A Cypro-PPNA?

While the discovery and designation of a Cypriot PPNB is still fresh, the suggestion of a Cypriot CPPNA now looms. The site of Ayia Varvara *Asprokremnos* was discovered in 1995 located approximately 15km south of Nicosia in Ayia Varvara. A limited survey was conducted by C. McCartney in 1995 in order to provide a preliminary assessment of the site. The initial surface survey and artifact collection gleaned a significant amount of pertinent information dealing with the nature of the site. *Asprokremnos* was defined as a "small depressed area partly sheltered by low outcropping limestone", and was identified as a small, single occupation Aceramic Neolithic site (McCartney 1998: 85). It was suggested that *Asprokremnos* was not a village, but rather a non-permanent location that was used for and/or during herding and hunting (McCartney 1998).

McCartney resurveyed the site in 2003, along with two other Aceramic Neolithic sites, Agrokipia *Paliokamina* and Politiko *Keladoni* in order to establish larger, more informative chipped stone assemblages. The resurvey of *Asprokremnos* acted not only to increase the size of the chipped stone assemblage, but also allowed for reinterpretation as the site was found to be more significant than the earlier survey suggested. Artifact concentrations were identified, including a possible 'quarry area.' The 2003 research revealed a generalized toolkit and "a greater prominence of core reduction activity" indicating that the production and use of tools were "of parallel importance," suggesting that *Asprokremnos* may be more representative of a 'permanent occupation' than initially believed (McCartney and Todd 2005: 14). In 2005 the collaborative EENC (Elaborating Early Neolithic Cyprus) Project began survey investigations and geoarchaeological studies focused on the collection of chipped stone data for the creation of a "lithic sequence" that could inform a relative chronology. Along with *Asprokremnos*, *Paliokamina* and *Keladoni*, mentioned above, a number of other sites were surveyed and collected. Additional research and analysis has focused primarily on *Asprokremnos* as it was found to have "no clear parallel in currently known Cypriot Aceramic Neolithic assemblages" (McCartney et al. 2006: 51). In 2006 the EENC returned to *Asprokremnos* to conduct subsurface excavations, fueled by the density of surface artifacts, with chipped stone appearing more similar to mainland PPNA assemblages. A total of seven trenches were excavated revealing a Neolithic occupation defined by artifacts and features (McCartney et al. 2007).

The artifacts recovered include a variety of chipped stone, ground stone pieces, shell beads, and picrolite ornaments, as well as red and yellow ochre and fire cracked rock. The ground stone assemblage has been reported to include pounders, rubbers, mortars, pestles, anvils, pecking stones, hammer stones, bowl fragments, and a shaft straightener (McCartney 1998, McCartney et al. 2007). The 2006 field excavations included soil flotation with "disappointing results," therefore a botanical profile is not currently available. Faunal remains were recovered in small numbers, with pig being the most common. Bird bones were also identified along with a crab claw (McCartney et al. 2007). No architectural remains were identified during excavations, only negative features (pits of various sizes) and a "cobble strewn occupation surface" were identified (McCartney et al. 2007: 31). Ongoing investigations may identify more significant architectural features in the future.

While the *Asprokremnos* surveys intentionally focused primarily on the collection of chipped stone artifacts, excavations revealed that chipped stone was in fact the most common artifact. The total chipped stone assemblage reported through 2006 numbers nearly 10,000 pieces, representing the entire *chaînes opératoire* indicating that lithic artifacts would have been produced on site. The majority of the assemblage was manufactured from "very high quality" raw materials, described as translucent red-brown cryptocrystalline chert. A number of high quality raw material nodules were also recovered indicating that the ridge adjacent to the site may have been a source of raw material (McCartney 1998, 2005, McCartney et al. 2007).

The number of cores, core fragments and core trimming elements recovered are thought to confirm the sites use in chipped stone production. Of the cores recovered the majority represent single platform, unidirectional cores, primarily "well prepared" blade cores (McCartney 1998, McCartney and Todd 2005, McCartney et al. 2006, 2007). The rejuvenation of cores at the site for use in further knapping is evidenced by the presence of core trimming elements. Facetted and single/plain platforms were the most common platform types identified, indicating that a direct percussion technique was employed in core reduction. Flakes constitute the majority of blanks, followed by blades, bladelets, microflakes, and spalls, but are outnumbered by debris (broken blanks and chunks), which are represent the majority of the assemblage. The high quantities of debris and complete blanks indicate both core reduction processes and more recent breakage from agricultural plowing (McCartney 1998, 2005).

The *chaînes opératoire* at *Asprokremnos* included the production of a high percentage of tools, including and significantly projectile points. Notably, the projectile points recovered as well as tanged (shouldered) pieces were found to be similar to those reported from mainland PPNA/Early Neolithic sites (McCartney 1998, 2005, McCartney et al. 2006, 2007). Laterally retouched flakes and blades constitute the bulk of the assemblage. Burins, notched pieces, scrapers and microlithic tools are among the most common types with surprisingly few backed and glossed pieces. The tools show a greater variety in raw material types including Lefkara basal, which would have been brought in to the site from elsewhere (McCartney 1998, 2005, McCartney et al. 2006, 2007).

Overall the chipped stone assemblage from *Asprokremnos* differs significantly from typical Cypriot Aceramic Neolithic assemblages. The discovery of this site and continuation of research will add to current knowledge of assemblage diversity, technology, and morphology. Various aspects of the assemblage, including core technology and the presence of specific tool types is considered to be representative of the late Epipaleolithic to Early Neolithic pattern seen from the Akrotiri phase and into Tenta Period 5 (McCartney and Todd 2005). Only further research at *Asprokremnos* (and hopefully the recovery of radiocarbon dates) will solidify its designation as a CPPNA habitation. Such a designation will advance the role of Cyprus in the mainland Neolithic Revolution.

2.4.2 The Cypro-PPNB

2.4.2.1 Overview

The dates documented thus far from the Aceramic Neolithic indicate that 8200 cal. BC marks the earliest known CPPNB habitation. The early CPPNB lasted through 8000 cal. BC, and includes *Mylouthkia* period 1A, *Shillourokambos* ancienne phases A and B, and Tenta period 5 (Peltenburg et al. 2000, Guilaine et al. 2000, Todd 2005). The middle CPPNB is thought to span from 8000 to 7500 BC and remains largely unknown, with few sites securely dated to this period. Investigations at *Ais Yiorkis*, however, provide a further look into this period (Simmons 2004, 2005, Simmons and O'Horo 2003). The late CPPNB lasts from 7500 to 7000 cal. BC, and is thought to include *Tenta* periods 4 through 2, *Mylouthkia* period 1B, and the *Shillourokambos* moyenne and récente phases, with some dates from *Ais Yiorkis* suggestive of occupation during this period as well (Todd 2005, Peltenburg et al. 2000, Guilaine et al. 2000).

The CPPNB spans over 1,000 years and contains several sites that are quite distinctive from one another. Although the CPPNB has been divided into Early, Middle and Late phases, a number of general trends have been identified that differentiate this period from the KC period. The CPPNB can be broadly characterized by the presence of features such as cisterns, wells and pits and less formal structures constructed from wood (evidenced by the presence of post holes) in opposition to the larger-scale stone constructions of the KC (Guilaine et al. 1995, Guilaine et al. 1998). The presence of such features has been variously documented at CPPNB sites, although it is important to note that not every site contains every type of feature. The disposal of human remains in the CPPNB is very different from later patterns, as remains have been recovered from pits and wells, and appear to represent informal, secondary burials. Economically CPPNB peoples exploited a variety of primarily imported resources including goat, sheep, fallow deer, pig and cattle, as well as wheat, barley, and lentils among others (Steel 2004).

The chipped stone assemblages of the CPPNB, particularly the Early Period, is characterized by a focus on naviform core technology and an opposed platform reduction technique, similar to the Levantine mainland. Obsidian is found in large quantities in the Early Period and slowly tapers off throughout the CPPNB. Sickle blades, similar to those found on the mainland at this time, are among the most common chipped stone tools of the Early CPPNB. Projectile points represent the most distinctive tools of this period as they too have their origin in the PPNB of the Levant, although they are generally quite rare and comparatively "crude". The production and use of projectile points quickly fades during the CPPNB. Raw material trends have also been documented during the CPPNB, revealing a focus on high quality translucent cherts in the Early CPPNB moving to the use of coarser opaque cherts in later periods. The changes in chipped stone assemblages are seen as a "clear line of development" (Peltenburg et al. 2001a, 2000, McCartney and Peltenburg 2000: see Steel 2004 for CPPNB summary).

2.4.2.2 Parekklisha *Shillourokambos*

The early CPPNB site of Parekklisha *Shillourokambos* is located near the town of Parekklisha, 6km from the southern coastal city of Limassol. Radiocarbon dates, and differential artifact analysis have allowed archaeologists to identify five phases of occupation dating between 8200-7500 cal BC, including Early Phase A, Early Phase B, Middle Phase, Late Phase, and a Ceramic Neolithic Phase (Guilaine and Briois 2001). The people of *Shillourokambos* exploited a variety of animal species including domestic pig, fox, fallow deer, goat, sheep, and most notably cattle. The discovery of cattle remains at the site is very significant, as cattle were traditionally believed to have been first introduced to the islands economy during the Bronze Age (Vigne 2001). Bowls, basins, pounders, querns, rubbing stones and axes (which are considered rare) compose the ground stone assemblage. *Shillourokambos* was discovered to contain a few incised cobbles, primarily engraved with the common checkerboard pattern (Guiliane and Briois 2001).

Excavations at *Shillourokambos* have revealed the skeletal remains of over 20 individuals, including adults and children (Guilaine et al. 2002, Cruzéby et al. 2003). A feature, characterized as a "large pit" or "possible well", believed to date to either an Early or Middle Phase was found to contain the remains of a contracted "aged" adult male above the fragmented and incomplete remains of a minimum of three other individuals. The burial appears to represent a multiple secondary burial, at least in terms of the remains of the fragmented, incomplete individuals. No grave goods were found in association with the remains (Guilaine and Briois 2001, Peltenburg et al. 2000). The excavation of one human grave in particular yielded numerous grave goods, but most significantly appears to be associated with a cat burial in the same stratagraphic sequence (Vigne et al. 2004).

The Early phases at *Shillourokambos* are defined by architectural features including three wells, pits, trenches and postholes that were cut into the havara and may have provided the foundation for animal enclosures. Apertures were also found cut into the havara and have been interpreted as possible doorways. Wattle and daub structures evolved into stone and mud structures during the Early Phases. Middle and Late Phase architecture consisted of more substantial structures in the form of circular houses with walls over one meter thick in the Late Phase (Guilaine and Briois 2001).

The chipped stone assemblage from Shillourokambos has been divided into two traditions (the Early Phases A and B and the Late Phase) based on technology and typology. The assemblage at large is made up of "several hundred thousand" pieces, and is dominated by translucent chert in the early phases and shifts to a local "fine-grained" opaque chert in the later phase (Guilaine et al. 2000: 76). Obsidian appears rather frequently in the earliest deposits (with over 300 pieces) and gradually decreases through time (Guilaine and Briois 2001). Deposits were found to contain a significant amount of refuse with debris reflective of core reduction and of tool production taking place on-site (Guilaine and Briois 2001, Guilaine et al. 2000, Guilaine et al. 1995). Three separate *chaînes opêratoire* have been identified at *Shillourokambos*, including the production of "bi-polar blades from large cores", "thick bladelets on the edge of flakes", and "small unipolar blades" (Guilaine and Briois 2001: 47). Bipolar blade production was the core reduction strategy of choice throughout the site's habitation, including in the manufacture of rare projectile points in the early phases. The occurrence of bi-polar blade technology in conjunction with the identification of "various types of projectile points" among the tools have been interpreted as reflecting the introduction of mainland PPNB production techniques to Cyprus (Guilaine et al. 2000: 76). The tools recovered from the site only account for between 8 to 10% of the chipped stone assemblage. Overall, the tool assemblage focused on scrapers, denticulated scrapers and notches, with projectile points waning from existence in the Late Phase, and the lunates present in the Early Phase transforming into sickles in the Late Phase (Guilaine and Briois 2001, Guilaine et al. 2000).

2.4.2.3 Kissonerga *Mylouthkia*

Kissonerga *Mylouthkia* located on the southwest coast of the island, has also been identified as an early CPPNB site. The primary features of the site were five wells, radiocarbon and AMS dated to between 6800 and 8600 cal BC. *Mylouthkia* has been divided into two periods, Period 1A and Period 1B, separated by 1,000 years (Peltenburg et al. 2003, 2000). Excavations at *Mylouthkia* revealed well-preserved carbonized botanical remains. A great variety of botanicals of both wild and domesticated plant species were identified, including hulled barley, glume wheats, lentils, pistachio, legumes, nuts, roots and tubers, and linseed/flax, as well as a variety of weeds (Peltenburg et al. 2001b, 2000). The botanical remains identified at *Mylouthkia* indicate that the later Khirokitian agricultural tradition had been well established by 7000BC (Peltenburg et al. 2001b). A variety of faunal remains were recovered, both disarticulated and articulated, including goat, sheep, pig, fallow deer, and birds. The whole/articulated remains of 23 caprines were found within a single well (No. 113). Limpet shells were in abundance suggesting that they were cleaned and eaten at the wells (Peltenburg et al. 2001b). The ground stone assemblage contains a large number of artifacts including fragments of vessels/bowls, "crude" hammer stones, pecking, polishing, and grinding stones, basins, along with lesser quantities of "weights", anvils, "cupped" stones, and a mace head (Peltenburg et al. 2001b).

Human remains were restricted to a single well, designated 133. The well contained the disarticulated remains of five individuals, one child, one adolescent, and three adults, represented by skulls and skull fragments, mandibles, vertebra, long bones and miscellaneous fragments. Interestingly, the human remains were associated with the remains of 23 caprines, and have been considered "components of a single bone assemblage" (Peltenburg et al. 2001b: 69). Human remains, opposed to caprine remains, were more often found at the periphery of the well. A mace head was found in close proximity to the human remains, and it has been suggested that it was purposefully associated with the remains as grave goods or with ritual or religious significance. Based on the depth of fill separating some of the human remains it has been suggested that there were at least two "depositional episodes" (Peltenburg et al. 2001b). The primary architecture or evidence of human construction at *Mylouthkia* is represented by the five wells, approximately 8.5-7 meters deep. The bottom of the well basins were carved into the havara bedrock to catch water flowing downhill in underground streams. Other features at *Mylouthkia* include a "semi-subterranean structure" as well as three pits (Peltenburg et al. 2001b).

The chipped stone assemblage recovered from *Mylouthkia* is limited, comprised of just 836 pieces, and is characterized primarily by the use and reuse of tools. The assemblage has been divided into two phases, Period 1A and Period 1B, based on radio carbon chronology and identifiable differences in the samples themselves based on differential *chaînes opératoire*, as well as differences in tool types and raw material choices. *Mylouthkia* Period 1A has been identified as Early Cypriot Aceramic Neolithic (Cypro-E/MPPNB) and totals only 140 pieces. Period 1A is defined by a chipped stone industry based on re-working and re-using tools, with primary production of blanks taking place elsewhere. While evidence of core reduction is minimal, one-third of the Period 1A assemblage is made up of tools, tool fragments and resharpening pieces. Burins were among the most frequent tools in the assemblage, along with utilized blades and flakes. Retouched flakes and blades, glossed pieces, perforators, and pieces escallier are also among the tool assemblage, with lesser quantities of truncations and backed pieces, with scrapers, notches and denticulates completely lacking. A high quality translucent chert was the raw material of choice during Period 1A, comprising 43.75%. Obsidian constitutes 12% of the Period 1A chipped stone assemblage, which is notably larger than the 2% from the same period at *Shillourokambos* (McCartney and Gratuze 2003, McCartney 2005).

Mylouthkia Period 1B has been identified as belonging to the Middle Cypriot Aceramic Neolithic (Cypro-LPPNB) and totals a more substantial 688 pieces. Period 1B is characterized by the presence of core reduction debris and significant numbers of blanks. Both debitage and core data reveal a much greater focus on the production of flakes compared to Period 1A. The tool assemblage of Period 1B, although larger in number represents less of the total assemblage than that of 1A. Among the tools a much broader range of types have been identified, constituting a very different assemblage. Like Period 1A, utilized flakes and blades represent the majority, with retouched flakes and blades, truncations, glossed pieces and perforators also in the same proportions, but with the addition of scrapers, notches and denticulates, and large increase in backed pieces in Period 1B. The change in core technology from bi-directional naviform-like cores in Period 1A to the use of single platform cores for the primary production of flakes in Period 1B is considered to be associated with changes in tool production and use. Period 1B exhibits a shift in raw material use from primarily high quality translucent to a preference for Lefkara cherts comprising 59.1% of the assemblage (McCartney and Gratuze 2003, McCartney 2005).

2.4.2.4 Kalavasos *Tenta*

Kalavasos *Tenta* is located in south-central Cyprus 3.2km north of the coast. A series of 21 radiocarbon dates obtained from *Tenta* were found to span a very broad time span from 8228 +/- 139 cal. BC to 4508 +/- 290 cal. BC. Originally the early dates were contested and accusations of contamination caused them to be pushed from the forefront, and *Tenta* was wholly considered to be contemporary with Khirokitia. The chronology of *Tenta* has since been reevaluated and five periods of occupation have been established, allowing for the very early dates to be identified as an early CPPNB component. This early component, period 5, would have been contemporary with the early ancienne phase at *Shillourokambos*, and period 1A at *Mylouthkia* (Todd 2001, McCartney and Todd 2005). Despite very poor preservation of botanical remains, a number of species have been identified from all periods of occupation at *Tenta,* unfortunately with the exception of Period 5, which has been identified as the CPPNB occupation. Domesticated species include emmer wheat, barley, lentils, einkorn wheat and pea. Weeds, such as fig, pistachio, wild pear, and caper, probably used for subsistence, were also identified. Period 5/4 focused on emmer wheat, barley and lentils, with einkorn, fig and small wild barley appearing in early Period 4 assemblages. This assemblage remains relatively consistent throughout the occupation of Tenta, with emmer wheat appearing slightly more abundant in Periods 2 and 3, and einkorn increasing in Period 4. Overall the botanical assemblage is considered indicative of a "mixed agricultural subsistence supplemented by gathering wild resources" (Hansen 2005: 326, 2001,).

The faunal assemblage recovered from *Tenta* includes 2,817 bone fragments that were identifiable to taxa, in spite of severe calcareous encrustation. Caprines, pigs and fallow deer comprise the primary subsistence base and make up 99.7% of the mammalian assemblage. Fox, cat, and rodent comprise the remaining 0.3%. A very limited amount of bird and fish remains were also identified. Poor preservation aside, the bulk of the faunal remains was recovered from deposits from Periods 2 and 4. A number of trends were identified including an increase in the use of pigs and a decrease in deer between Periods 4 and 3, and a slight decrease in pigs between Periods 3 and 2 (Croft 2005).

The remains of 18 individuals were recovered from 14 burials. A total of 13 individuals were identified as belonging to Period 4, a single individual was identified as Period 4 "or later", two individuals were attributed to Period 3/Period 2, and two individuals are of undetermined chronology. No human remains were recovered from Period 5, the CPPNB occupation. The majority of the 14 inhumations were single, primary burials with individuals articulated in either a flexed or contracted position. Of the 18 individuals eight have been identified as adults, two as children, and eight as infants. Some of the burials were discovered within the floors of houses as at Khirokitia, while others were located outside of houses within rubbish layers. The greatest number of burials (76.9%) was recovered from the Lower South Slope Area of the site, with 15.4% from the Top of Site and 7.7% from the East side of the Top of Site. The preservation of human remains at *Tenta* has been noted as poor, which may or may not be reflected in the small sample size (Todd 1982, Moyer 2005).

The architectural design is similar to that of Khirokitia with large curvilinear structures located on natural hills surrounded by a large protective wall. In the earliest phase of occupation, Period 5, features such as postholes and pits are the only signs of any sort of architecture. During Period 4 the first true permanent structural features were constructed in the form of a wall, with a ditch encircling the village, and a minimal number of stone and mud houses. Period 3 witnessed a surge in structural development with the building of additional "houses". In Period 2, inhabitants made use of earlier structures, and continued building additional structures. Deposits from Period 1 were destroyed by erosion and agriculture and not much is known (Todd 2001).

Traditionally, the chipped stone assemblage of *Tenta* was considered to be similar to or the same as that of Khirokitia, but further detailed analysis has recently proven otherwise. The chipped stone recovered from *Tenta* shows greater diversity in production technology and in the types of tools produced and utilized than originally thought. A variety of "diagnostic early chipped stone" artifacts were identified from the earliest deposits enabling *Tenta* period 5 to be linked to early phases of *Shillourokambos* and *Mylouthkia* (Todd 2001, McCartney and Todd 2005). The chipped stone recovered from *Tenta* will be discussed in detail in chapter 6 in order to compare the assemblage to that of *Ais Yiorkis*.

2.4.2.5 Akanthou *Arkosyko* (Tatlisu-*Çiftlikduzu*)

Akanthou *Arkosyko* or Tatlisu-*Çiftlikduzu* was first recorded in 1931, but true investigations did not begin until 1996. The North Cyprus Archaeological Survey Project examined the site in greater detail, exposing a variety of notable features and amassing a large artifact assemblage. Akanthou is located on the coast of northeastern Cyprus, and is in view of the Taurus Mountains in Anatolia. Radiocarbon samples were obtained from the site for dating, but the results have not yet been released. Despite this lack of hard dates, Akanthou has been identified as Cypro-PPNB based on artifactual evidence (Sevketoglu 2002).

Barley and einkorn have been identified among the botanical remains as primary domesticates (Sevketoglu 2002). Faunal remains indicate a reliance on fallow deer, sheep and goat. Cattle remains have also been reported to be among the faunal assemblage, although context may present a problem. The secure presence of cattle at Akanthou would further evidence the existence of *Bos* in Cyprus early in the Aceramic Neolithic along with *Shillourokambos* and *Ais Yiorkis*. Notably, cut marks have been identified on one *Bos* fragment (Sevketoglu 2000, 2002). The ground stone artifacts recovered from Akanthou include ground stone vessels, axes, mortars and a pestle, and querns and grinders. Other artifacts include worked bone, antlers, perforated shell, pierced shell and stone beads. A number of features were excavated, including a variety of pits. Architectural evidence occurs primarily in the form of a stone wall. "Beaten earth" and/or plastered floors were also excavated and identified as architectural features (Sevketoglu 2000, 2002).

A variety of chipped stone artifacts were recovered from Akanthou, including a very large obsidian assemblage (over 1,000 pieces) (Sevketoglu 2002). Although formal analyses have not yet been conducted, the assemblage has been generally identified as Aceramic Neolithic. Overall, the chipped stone assemblage is comprised of approximately 3,000 pieces, and is indicative of a primarily "blade-based industry" (Sevketoglu 2000, 76). Tools, though not fully analyzed, are considered to represent a variety of types and a broad range of sizes. Some of the identified tool types include scrapers, sickles, knives, and retouched pieces. The obsidian industry is also predominantly blade oriented, with lesser numbers of flakes and chunks. The presence of obsidian flakes and chunks at Akanthou has been interpreted as evidence for local obsidian reduction (Sevketoglu 2000, 2002). Unfortunately, the modern political situation surrounding the site of Akanthou has limited the principal investigator's ability to publish therefore no specific data examining the chipped stone assemblage is currently available.

2.4.3 Khirokitia Culture

As previously discussed, the Khirokitia Culture Period is the final stage of the Cypriot Aceramic Neolithic and is named for the type site Khirokitia *Vounoi*, which is thought to epitomize the late Aceramic Neolithic in Cyprus. The KC spans from 7,000 to

5,500 cal. BC, and is the best known of the Cypriot Aceramic Neolithic culture periods. The sites identified as belonging to the Khirokitia Culture share a number of common characteristics, including the presence of permanent settlements with large scale circular architecture, and distinctive artifact assemblages and burial patterns. Chipped stone assemblages of the KC exhibit significant differences from earlier assemblages. Notably, projectile points virtually disappear in the KC period, and sickles are found in much fewer numbers. The primary stone tools represented are utilized and backed pieces. The raw materials used in the production of chipped stone tools have been identified as locally available, but imported obsidian becomes increasingly sparse and is rare during this period. Chipped stone tools have been found to be complemented with greater quantities of bone tools during the KC as well. Burial patterns shift from the largely secondary nature of early Aceramic Neolithic burials to a greater focus on the individual with formal interments into pit graves within the floors of houses. The KC is also associated with a greater emphasis on personal ornamentation (i.e., beads) as well as representational art (i.e., figurines) (Steel 2004).

It is important to note that not all sites fit neatly into a single period. Kalavasos *Tenta* for example spans multiple periods within the Aceramic Neolithic and therefore displays characteristics from various periods. Tenta, while having a Cypro-PPNB period component as discussed above, primarily represents a significant KC period settlement. The following sites have been positively identified as KC sites based on formal dating and/or the presence of type artifacts/features. Although many sites exhibit formal architecture in the form of circular housing structures, not all sites represent large villages and that site size is quite variable. Not all of the sites contained burials, and in spite of trends there remains artifact variation between assemblages. The Khirokitia Culture includes Khirokitia *Vouni*, Kholetria *Ortos*, Cape Andreas *Kastros,* and *Tenta* Period 1, with a number of other sites (ca 20) known through various degrees of survey and/or excavation (Dikaios 1953, Simmons 1994a, Le Brun 1993, Todd 2005).

2.4.3.1 Khirokitia *Vounoi*

Khirokitia *Vounoi*, the type site for the Khirokitia Culture and is thought to epitomize the time period. Khirokitia is defined primarily by massive circular architecture ascending the hillside. Radiocarbon dates collected from Khirokitia range between 7000/6500 cal BC and 5800/5500 cal BC (Le Brun 2001). Khirokitia boasts very well preserved botanical remains, recovered in large quantities from various deposits (Hansen 2001). Einkorn, barley, emmer wheat and legumes were the primary domesticated plants identified at Khirokitia. The faunal assemblage was made up of fallow deer, pig, goat and sheep. "Enigmatic" incised or engraved stone cobbles were recovered from Khirokitia (which also occur at Kholetria *Ortos*). The ground stone assemblage contains a great variety of vessels including basins, bowls, trays, and "spouted prestige receptacles", which have only been found in burials (Le Brun 2001). Axes, pecking and polishing stones were also among the ground stone assemblage (Dikaios 1940).

Khirokitia boasts the largest number of Aceramic Neolithic burials, with a sample of 60 providing detailed profiles. People of all ages and sexes were buried within the floors of houses and were all "single primary pit" burials of one of two types, "simple" or "elaborate" (Le Brun 2001: 115-116). The site plan of Khirokitia appears to have been very carefully laid out, as "artificial protection" was constructed in the form of walls and structures built of stone and mud. The entire village was surrounded by a wall with specially placed "access points". One such access point required a stairway comprised of 12 steps to allow entry into the village. Houses took the form of circular structures (opposed to mainland rectilinear structures) with floors plastered with mud. Typically multiple circular structures were arranged in a "compound" with an open area in the center, which acted as a courtyard where a food processing station was established. It is supposed that each circular structure probably housed a single nuclear family (Le Brun 2001).

The chipped stone industry from Khirokitia has been described as technologically "impoverished", "rough", "monotonous", and "rustic" (Le Brun 2001: 113, 1993). Overall the assemblage has been found to exhibit very little variation, and is considered notable for its simplicity (Waechter 1953, Cauvin 1984, Le Brun 2001). The majority of the debitage is represented by flakes, primarily displaying single or plain platforms, with dihedral types occurring rarely. "Levallois-like" points and blades have also been identified among the debitage. The bulk of the assemblage was struck more often than not from single platform cores, although discoidal Levallois-like and opposed platform cores were also recovered (Le Brun 1993: 71). The chipped stone tools identified at Khirokitia include backed pieces (some exhibiting gloss), denticulates, notches, scrapers, a limited number of burins, few perforators, and even fewer projectile points (Stekelis 1953, Le Brun 1993, 2001). Stekelis examined the chipped stone assemblage according to provenience. Contexts inside of structures, outside of structures and on the ground surface were compared, and were found to show no differences. Differences in technology were not found between layers either, indicating that the culture of the inhabitants remained stable and unchanging throughout the sites occupation (1953). Less than 50 pieces of obsidian were recovered from the site, which is miniscule in relation to the size of the greater chipped stone assemblage and virtually insignificant compared to other Aceramic Neolithic sites (Le Brun 2001).

2.4.3.2 Kholetria *Ortos*

The site of Kholetria *Ortos*, located 20km east of the southern coastal city of Paphos, represents a Khirokitia Culture Aceramic Neolithic site. *Ortos* has been dated to between 5420 and 5950 cal. BC, temporally placing the site late in the last phase of the Cypriot Aceramic Neolithic (Simmons and Corona 1993, Simmons 1994b). Preserved botanical remains were found, including, domesticated plants, barley, emmer wheat, einkorn, peas and lentils. Lentils tended to dominate the botanical assemblage (Cooper 1997, Simmons 1994a). The faunal assemblage includes quite significant quantities of fallow deer, and domestic or pre-domestic pigs and caprines (116 of 143 were identified as sheep). As caprine remains were the most abundant at the site, they appear to represent the animal of choice, as a "major economic contributor." The remains of fox were also identified among the faunal assemblage, albeit in very small numbers (Simmons 1994a, 1994b, Cooper 1997). The ground stone assemblage recovered from *Ortos* consists of a large variety of bowl and vessel fragments, axes, pecking stones, pounding and grinding stones. Twenty-five incised stone cobbles were also among the ground stone assemblage, displaying various patterns, including "checker board", "chevron", "star burst" and "parallel incisions" on a single side. The assemblage from *Ortos* appears quite similar to that of Khirokitia, which is not surprising as the sites are contemporary (Simmons and Corona 1994, Simmons 1994a, 1994b, 1994c).

Fragmented human remains were uncovered, including two mandibular fragments and four teeth (Simmons 1994c). The remains appear to represent a minimum number of four individuals, including two adults and two "young adults" (Simmons 1994b, Cooper 1997). Individual No. 2 suffered from periapical abscess and periodontal disease and was probably in substantial pain at the time of death. None of the remains appear to have been in primary context although it has been suggested that "features" identified during excavation may have been the remnants of graves (Simmons 1994a). No standing architecture was uncovered at *Ortos*. Fragments of mud brick and pisé were excavated, indicating that some form of architecture was present at the site (Simmons 1994a, 1994b).

A large number of lithic artifacts were recovered from *Ortos*, totaling over 62,000. Only two pieces of obsidian (a broken blade tool and a broken bladelet) were found among the chert dominated assemblage. The assemblage represents the entire *chaînes opératoire,* however 76.6% of the debitage represents tertiary reduction, which considered in combination with the profusion of microflakes is more indicative of tool production and maintenance than of initial core reduction. A variety of raw material types were recognized, with the most common being Lefkara and Moni (Simmons 1996).

Around 2,000 cores and core fragments were documented at *Ortos*. Of the cores, 38% were identified as exhausted (reduced down to a 50mm or less), indicating efficient reduction. Interestingly, 9.1% of the cores are of a very specific type first identified on the Akrotiri Peninsula typed Akrotiri cores. The most common core types are multidirectional and globular. The vast majority of the cores were flake cores (95.3%), while very few blade cores (3.1%) and even fewer bladelet cores (1.6%) were identified. In general the Aceramic Neolithic is blade-based, whereas *Ortos* has a low blade to flake ratio, with only 1 blade per 5.6 flakes. In spite of the comparatively low blade ratio, 46% of the tools were made on blade blanks. Other observations include the bimodal nature of the blades (large or small), the presence of hinge fractures on a number of broken pieces, and the identification of a large amount of burned pieces (Simmons 1996).

The *Ortos* assemblage includes over 1,200 tools with retouched and/or utilized blades and flakes comprising the majority of types, followed by sickle blades (15.9%) indicative of plant harvesting. A number of broken tangs were identified, displaying either a single or double shoulders, typically with unifacial retouch (Simmons 1996). Scrapers, truncations, bifaces, unifaces, burins, and "large" crescents were among the more common tools of the chipped stone assemblage, while projectile points were found to be completely lacking (Simmons 1994a, 1994b, 1996). Among the scrapers, a new tool type was identified, the *Ortos* scraper, which has typical invasive scraper retouch on the distal end, which forms a "protrusion or nose" (Simmons 1996). Overall, the *Ortos* assemblage acted to expand the Cypriot Aceramic Neolithic chipped stone database in a number of ways.

2.4.3.3 Cape Andreas *Kastros*

Excavations at Cape Andreas *Kastros* were carried out between 1970 and 1973, and were then discontinued with the Turkish invasion in 1974. Cape Andreas Kastros is located on the northeast coast of the island, near the tip of the Karpasia peninsula. The site is described as being "lodged in a natural amphitheatre formed by a rocky spur which dominates the farthest land point and is attached to the side of a steep slope which falls abruptly onto the sea" (Le Brun 1993: 56). Due to the nature of the site's geography and its location on high ground it is considered to be defensible or "naturally protected" (Le Brun 1993: 56). Through the collection of botanical remains, the sites inhabitants are known to have exploited the typical Aceramic Neolithic suite of einkorn, emmer wheat, barley, lentils, peas, pistachio, fig, olive, and flax. Pig, sheep, goat, and fallow deer are among the faunal remains recovered from Cape Andreas (Le Brun 1993, Steel 2004).

The ground stone assemblage displays a variety of vessel forms, of two types, coarse (basins and trays) and fine (basins and bowls). Other ground stone artifacts include querns, hand stones, grinders, and pestles. Other artifacts such as ground stone pendants and beads have been recovered, along with pointed perforating tools (Le Brun 1993). Much evidence of the exploitation of marine resources, including fish hooks, marine shells, crab and sea urchin remains, and fish bones have been recovered. Circular architecture as is the norm for Aceramic Neolithic sites has been documented at Cape Andreas (Steel 2004, Le Brun 1993).

The chipped stone assemblage from Cape Andreas, comprised of over 9,000 pieces, is considered to be similar to those of other Aceramic Neolithic sites. The majority of the raw material used for the production of such artifacts has been identified as average quality flint, although better quality materials have also been recognized among the assemblage. A total of 13 obsidian blade and bladelet fragments were recovered which have been traced to central Anatolia. Of the 322 cores recovered, the vast majority are single platform (68.65%), followed by double platform cores (15.85%). Notably, the bulk of the Cape Andreas assemblage (88.02%) is made up of blanks (flakes, blades, and bladelets) and blank fragments. The debitage displays a very high proportion of flakes (95.75%) to blades (4.25%), although the ratio of tools on flakes to tools on blades is much more balanced. The tool assemblage is made up of 839 tools, the majority of which are sickles at 26%. Other tools included in the assemblage are retouched flakes and blades, backed pieces, scrapers, denticulates, burins, truncations, and notches (Le Brun 1981). Although the chipped stone data recovered from Cape Andreas is published with a significant amount of detail, very few interpretations or conclusions are offered as to the significance of the assemblage.

2.4.4 Other Sites

A number of other sites have been documented as Aceramic Neolithic, including, Kannaviou *Kochina,* Petra Tou *Limniti*, Dhali *Agridhi*, Klepini *Troulli*, the Karavas area, Bellapais *Vasiliki*, Philia *Drakos*, Phrenaros *Vounistiri*, Ayia Napa *Tighani*, Ayia Anna *Perivolia*, Skarinou *Kholetra*, Kataliondas *Kourvellos*, Mari *Mesovouni*, Trakhoni *Vounaro*, Kedhares Yero *Vasili*, (see Cherry 1990 for discussion and full references, Held 1989, Knapp et al. 1994) Agrokipia *Paleokamina*, and Politiko *Kelaïdhoni* (Knapp and Given 1996), and Alambra *Koundourka*, Alambra *Spileos*, Alambra *Mouttes*, Alambra *Foradomontres*, Pera Chorio *Moutti*, Agia Vavara *Pervolia*, Agia Vavara *Poupes*, Agrokipia *Kottafoi* (see McCartney et al. 2006). None of these sites is particularly well studied, nor is much information in the form of published works available detailing them. Despite the lack of formal excavation and publication in most cases, these sites have been positively identified as Aceramic Neolithic based on specific chipped stone characteristics, along with a general lack of pottery and other artifact types that occur later.

2.5 Gaps

Following the Aceramic Neolithic there appears to be a gap between the final KC and the Ceramic Neolithic (or Sotira Culture). Aceramic Neolithic villages were seemingly deserted around 5,500 BC, and the Ceramic Neolithic settlements were founded around 5,000 BC. Very little overlap of Aceramic and Ceramic sites has been documented (Knapp et al. 1994, Steel 2004). Debate about the origins of the Ceramic Neolithic population and culture of Cyprus is ongoing. Some archaeologists argue for continuity between the Aceramic and Ceramic cultures, while others argue for an Aceramic Neolithic abandonment of Cyprus and a Ceramic Neolithic repopulation of the island (Watkins 1973, Stanley-Price 1977a, Knapp et al. 1994, Peltenburg et al. 2003).

The continuity hypothesis suggests that the development of the Ceramic Neolithic occurred locally, continuing from the preceding Cypro-Aceramic Neolithic, despite the current lack of evidence of a cultural overlap, apparent chronological gap, and largely differential material culture (Knapp et al. 1994, Steel 2004). The continuity hypothesis evidences the presence of small amounts of ceramics, identified as Dark Faced Burnished Ware, at the Ceramic Neolithic site of Dhali *Agridhi* that have been dated to 4465 ± 310 B.C. and 4560 ± 100 B.C. (recalibrated) (Lehavy 1989). The repopulation hypothesis argues for the abandonment of Cyprus following the KC and migration of mainland Ceramic Neolithic people to recolonize Cyprus. The repopulation of Cyprus in the Ceramic Neolithic is currently the stronger of the hypotheses as the supporting evidence is more substantial. The lack of a developmental or learning stage in pottery production, along with significant changes in architecture, the organization of settlements and domestic space, and burial patterns between the Aceramic and Ceramic periods all support the abandonment/repopulation hypothesis (Steel 2004).

Physical anthropology has also been used to examine the Aceramic-Ceramic Neolithic gap. Specifically, the human remains recovered from the Aceramic and the Ceramic Neolithic periods have been examined for evidence of continuity. Cranial remains from Khirokitia have been compared to those from the Sotira Culture revealing that the samples largely exhibit significant differences representative of differential parent populations. In biological terms Khirokitia crania were generally found to exhibit brachycrany (short-headedness), compared to the trend towards dolichocrany (long-headedness) at Sotira (Angel 1953, 1961, Charles 1962, Walker 1974-1975, Harper 2003). It must be noted that the populations studied represent rather small samples, which may potentially affect the accuracy of the study and the reliability of the results.

In spite of his conclusion that the Sotira population is unlikely to have descended from the preceding KC, Angel (1961) concedes that two or three long-headed Khirokitian families (presumed from a documented individual) may have founded the Sotira population.

An understudied option in the Aceramic-Ceramic Neolithic gap is the possibility that bridging sites have simply not yet been found. Current research into the early Aceramic Neolithic, as discussed previously, provides an appropriate example of how archaeological discoveries can change the accepted knowledge of prehistory. The ceramics found at Dhali *Agridhi* represent the earliest known pottery in Cyprus (Lehavy 1989). Dark Faced Burnished Ware found in Cyprus has been typologically linked to the mainland Levantine ceramic sequence from Amuq (Watkins 1970). The relationship between the early Cypriot and contemporary Levantine ceramics at the very least indicates contact between Cypriot and mainland populations. It is possible that mainland Levantine people migrated to Cyprus with their knowledge of ceramic technology (Dark Faced Burnished Ware) and other typical mainland traits (material culture and architecture) and mixed with Khirokitian Culture Period peoples.

2.6 The Pottery Neolithic

The Ceramic Neolithic, though not the focus of this research, remains chronologically and culturally within the Neolithic. As there is a possibility that the population of the Ceramic Neolithic is continuous from the Aceramic, it is important to have at least a minimal understanding of the period. Unlike the above review of the Aceramic Neolithic, the following will simply provide an overview of the Ceramic Neolithic as a general time period. Individual sites will not be addressed and specific details will not be provided, but overall cultures and ceramic typology will be discussed.

The Ceramic Neolithic is characterized first and foremost by the cultural focus on pottery production. Interestingly, it has been noted that the ceramic technology utilized by the Cypriots of the Ceramic Neolithic does not appear to have gone through a developmental stage, but rather was introduced as a learned and ready technology. Ceramic Neolithic sites were generally chosen for their proximity to the coasts. An increase in sedentism also characterized the Ceramic Neolithic with more complex architecture. Ceramic Neolithic settlements have been characteristically identified as small villages, ranging between 0.5 and 1.5 hectares. Population estimates have concluded that approximately 500 individuals would have inhabited a Cypriot Ceramic Neolithic village. Villages are typically situated on high ground, possibly chosen for defensive purposes (Steel 2004, Clarke 2001).

A three tier system has been implemented for the social organization of the Ceramic Neolithic. Clarke (2001) has suggested that three levels of relationship existed between the populations. The first level of social relationship is the "cluster." Clusters include a number of sites within a single community that serve different purposes. The second level includes "medium" size settlements that are in close proximity to one another, although the relationship of these larger villages is unknown. The third level is made up of the "overall settlement pattern," the members of which would have shared a mutually beneficial economic relationship (Clarke 2001, 66, 71, Steel 2004, 67-68).

Ceramic Neolithic populations exploited a diverse economy, including those products procured through agriculture, herding, hunting, and foraging marine resources. Botanical remains have been recovered from middens and house floors, indicating that both cultivated and wild plants were exploited, including wheat, oats, rye, and chick peas. The faunal remains recovered revealed that sheep, goat, fallow deer, and pig were the primary animal resources exploited during the Ceramic Neolithic (Steel 2004).

Ceramic Neolithic sites generally fall into one of two types. The first type consists of "medium sized settlements" include Sotira *Teppes*, Klepini *Troulli*, Ayios Epiktitos *Vrysi*, Kandou *Koufovounous*, Paralimni *Nissia* and are defined by the presence of "relatively permanent structures." The second type is characterized by those sites that are smaller in size and lack structures, and those "dominated by pits," and include the sites of Kalavasos *Kokkinoyia*, Dhali *Agridhi*, and Mari *Paliambela* (Clarke 2001).

The primary Ceramic Neolithic architectural features are thought to represent domestic spaces or houses that are generally single story, one room structures that are square in shape with rounded corners. Notably, no public architecture and/or public spaces have been documented. Domestic structures were of various sizes, averaging 14.2m^2 at Vrysi and 16m^2 at Sotira. Walls were constructed on stone foundations and were then built of mud brick and pisé. The interior of domestic architecture was plastered, and wood was used for roof support in the form of beams and posts. Roofs were fashioned from mud and reeds, and were either flat or conical. Structures typically had only one entrance, with a single step down onto hard packed mud or clay flooring. Features found within domestic structures include hearths and benches made from stone or pisé. The types of artifacts generally found within domestic spaces include various bone and picrolite artifacts, chipped stone tools, and ground stone vessels and tools such as querns, mortars, pestles, rubbers, probable spindle whorls, chisels, axes, and adzes. The artifact assemblage of the Cypriot Ceramic Neolithic has a notable lack of figurines. Again, the presence of ceramic artifacts is the most defining feature of sites of this period (Steel 2004).

The clay used in ceramic production was procured from beds local to the respective area. Vessels were made in a finite number of forms using a "simple coil" method and were then fire hardened in hearths. Hemispherical bowls, hole-mouth jars, and ovoid jugs are among the decorated ware vessel types. Production of coarse ware vessels was limited to a form of shallow tray displaying a pierced wall. The primary differences between ceramics were in decoration rather than in form (Steel 2004).

A broad framework has been developed in order to classify the pottery types of the Ceramic Neolithic. The basic typology presented by Dikaios (1962) has been revised and continues to be variously defined as chronological, regional or both (Clarke 2001, Steel 2004). The pottery typology includes three major categories, including Dark Faced Burnished Ware, Broad Line Red on White Ware, and Combed Ware. Dark Faced Burnished Ware is characterized by "the application of a thick monochrome red paint, often burnished to a high sheen," and is closely associated with the population that inhabited the site of Philia *Drakos* (Clarke 2001, Steel 2004). Broad Line Red on White Ware is well-named as this type is characterized by a white slip with "broad lines" of red paint encircling each piece. Broad Line Red on White Ware is associated with more northern sites, including and especially Klepini *Troulli* Period II (Steel 2004, Clarke 2001). Combed Ware has been described as decoration created by using a "multiple tool to remove the red painted surface while still wet producing a variety of straight and wavy combed lines," and is associated with southern sites and more specifically the Sotira Culture (Clarke 2001: 69, Steel 2004). Although the types are rather distinctive, they are not mutually exclusive, as chronological and regional boundaries are not absolutely clear. Regional variation has been suggested as being attributable to a desire on the part of the people to express their culture stylistically (Steel 2004).

Continuity between the Aceramic and Ceramic Neolithic, though not established, implies a continuation of culture and therefore enhances the importance of investigations into the unknown gap between the two periods. Like the beginning, the "end" of the Ceramic Neolithic is not well-understood. The relationship between the Ceramic Neolithic and the following Chalcolithic period has not yet been determined. The Ceramic Neolithic appears to culminate in a large-scale abandonment of settlements which may or may not be contemporaneous. Evidence of an Early Chalcolithic occupation at the Ceramic Neolithic site of Kissonerga *Mosphilia* have aided in our understanding of this transition, although inadequate dating has not allowed for cultural and chronological relations to be properly addressed (Steel 2004). Archaeological research examining the Cypriot Neolithic is ongoing, and promises to both solve and create mysteries. Investigations at Aceramic *Ais Yiorkis* are acting to augment the current research and to fill in missing data on the Cypriot Neolithic.

CHAPTER 3

INTRODUCTION TO AIS YIORKIS

3.1 The Local Environment and Resources of *Ais Yiorkis*

Kritou Marottou *Ais Yiorkis* is located in the uplands of western Cyprus, 20km northwest of the southern coastal city of Paphos, and sits roughly 460 meters above sea level. The site faces east-southeast, situated on a slope in the upper Ezousas River Valley near the modern village of Kannaviou (Rupp 1987, Fox 1987, Simmons 1998a). As the vast majority of Neolithic sites excavated in Cyprus have been found on the coasts and in the lowlands, *Ais Yiorkis* is quite distinct. Obvious differences between coastal and inland/upland sites include access to marine resources for economic purposes such as subsistence and ornamentation, but other geographic differences probably influenced differential settlement patterns as well. Inland, upland settlements offer a greater diversity of plant life, as well as mostly untouched, unfarmed terrain, unexploited and easily accessible chipped and ground stone resources, vast grazing lands for herd animals, and valley lookouts for surveillance for protection from potential or actual aggressors, as well as for monitoring of herds of fallow deer.

3.2 Archaeological History of Ais Yiorkis

Kritou Marottou *Ais Yiorkis* (hereafter *Ais Yiorkis*) was first recorded in 1980 during the Canadian Palaipaphos Survey Project (CPSP), under the direction of David Rupp. The CPSP survey was conducted using stratified sampling methods and focused on the Xeropotamos, Ezousas, and Dhiarizos drainages (Rupp et al. 1984, Rupp 1987). The project was designed to examine a previously unexplored area through systematic field survey in order to document "the pattern of human occupation and exploitation" of the area, collect environmental data, and to examine the copper and chipped stone industries employed in prehistory (Rupp et al. 1984: 134). The 1980 survey identified just two Aceramic Neolithic sites, Kritou Marottou *Ais Yiorkis* and Kannaviou *Kochina*. *Ais Yiorkis*, designated 80-E-46 for survey purposes, "stood out as particularly important" especially in terms of the chipped stone collection (Rupp et al. 1984: 140). This initial survey yielded a number of chipped stone artifacts along with ground stone bowl and axe fragments, all of which were preliminarily identified as belonging to the KC. The CPSP conducted additional survey in 1982, during which Kholetria *Ortos* was discovered and was also recorded as a KC period site. The 1982 project also returned to *Ais Yiorkis* for a more intensive and systematic surface survey, collecting 2,205 artifacts. Sixteen two meter units were surveyed, revealing chipped stone and ground stone assemblages, as well as two "potential building walls." A significant faunal assemblage was collected including deer, pig, sheep, goat, and a canid (a fox or dog). The fallow deer recovered represented 76% of the faunal remains, which is relatively typical of the Cypriot Aceramic Neolithic, but contrary to other assemblages the identified elements were found to be indicative of on-site butchering. The maximum depth of cultural stratum was estimated at 60cm and the site was estimated to span ca. 0.4 hectares. *Ais Yiorkis* was identified by the CPSP as a small settlement or "upland deer yarding and pig herding hamlet" (Fox 1987: 20, 26, Rupp et al 1984: 140, Rupp 1987).

In 1997 Alan Simmons conducted a testing project looking at both *Ais Yiorkis* and *Kochina* in order to determine whether in situ deposits were likely and if more intensive excavations were necessary at either site (Simmons 1998a). During the short five day survey at *Ais Yiorkis*, Simmons conducted not only surface collection, but also performed surface scrapes in order to examine both sides of the surface, as well as test excavation units to determine if intact, in situ deposits were present. Simmons' 1997 tests indicated that *Ais Yiorkis* was much more promising than initially thought based on early CPSP surveys, whereas *Kochina* was found to be less significant than originally presumed. Like the CPSP survey, Simmons' investigations also yielded a variety of artifacts indicative of a Neolithic habitation at both *Ais Yiorkis* and *Kochina*. Quite surprisingly, *Bos* remains were identified among the *Ais Yiorkis* faunal assemblage recovered during the survey (Simmons 1998a, 1998b). The discovery of *Bos* (cattle) at a Neolithic site such as *Ais Yiorkis* immediately warranted further investigation as, until remains were recovered from the early Neolithic site of Parekklisha *Shillourokambos*, cattle were believed to have been first introduced to the islands economy during the Bronze Age (Simmons 1998a, 1998b, Guilaine et al. 1995, Vigne 2001, Croft 1991).

Simmons returned to *Ais Yiorkis* in 2002 for more substantial investigations. The 2002 project was limited to just four weeks of exploratory excavations, focusing on small test pits and limited excavation units. Despite the small scale of the project, the size of the artifact assemblage greatly increased, and in situ deposits were revealed, including a small portion of the stone construction, deemed "Feature 1," as well as a cache of chipped stone, primarily consisting of blades (Simmons and O'Horo 2003, Simmons 2003). The goal of the 2003 season at *Ais Yiorkis*, to fully expose Feature 1, was accomplished, revealing the construction in full, further lending to the sites integrity and warranting further excavation. In 2004 the project turned to defining the extent of the site, and excavations moved up-slope to the above field. The 2005, 2006, 2007, and 2008 seasons, although not discussed in this research, also focused on the upper terrace, where numerous interesting features have been revealed including a plaster floor and basin, pits of all sizes, possible walls, an infant burial, and a suspected ditch boundary, among others. Each consecutive season has acted to increase the artifact assemblage, thereby allowing the site to be examined in terms of site type, use and boundaries.

A total of sixteen radiocarbon dates have been obtained from faunal remains, charred material, charcoal, and charred seeds recovered from *Ais Yiorkis* (see Table 3, Simmons 2003, 2007). Of the sixteen dates, two can be rejected from the average range due to their historic nature (AD 390-600 and AD 380-540). The remaining fourteen dates have placed *Ais Yiorkis* temporally between 7,960 and 5,660 cal BC. The average span of the prehistoric radiocarbon dates ranges from 7,306 to 7,083 cal BC. The dates recovered from the *Ais Yiorkis* samples have generally confirmed the artifact dating of the site to the Aceramic Neolithic. According to the temporal range *Ais Yiorkis* spans the Middle Cypro-PPNB, the Late Cypro-PPNB and the KC. The average span appears to place the site primarily within the Middle Cypro-PPNB. Although secure radiocarbon dates have been acquired the question of where *Ais Yiorkis* belongs culturally within the existing chronology remains. This problem will be addressed in detail in Chapter 6 using chipped stone analyses to further examine the nature of *Ais Yiorkis* and its place in the Cypro-PPNB.

Table 3 Radiocarbon dates from *Ais Yiorkis*

Laboratory #	Material	Corrected ^{14}C Age*	Calibrated Date (95% Confidence)
DRI 3441	Bos (1 bone)	7,867 ± 106 bp -24.21% per mil	7,007-6,468BC
DRI 3442	Sus (2 bones)	7,540 ± 169 bp -28.24% per mil	6,704-5,984BC
DRI 3442	Dama (1 bone)	7,658 ± 105 bp -26.49% per mil	6,698-6,673BC (1%) 6,666-6,212BC (99%)
CAMS 94861	Bos (1 bone)	8,290 ± 49 bp -19.36% per mil	7,520-7,180BC
Beta-183649	Charred material	8,480 ± 40 bp -23.0% per mil	7,580-7,500BC
Beta-183650	Charred material	8,600 ± 40 bp -26.8% per mil	7,630-7,570BC
Beta-183651	Charred material	8,580 ± 40 bp -27.1% per mil	7,610-7,560BC
Beta-203857	Charcoal	8,530 ± 40 bp -25.5% per mil	7,600-7,540 BC
Beta-213412	Charred seeds	8,510 ± 50 bp -23.2% per mil	7,600-7,510 BC
Beta-213413	Charred material	6,840 ± 40 bp -22.2% per mil	5,780-5,660 BC
Beta-213414	Charred material	8,590 ± 50 bp -25.6% per mil	7,650-7,560 BC
Beta-213415	Charred seeds	8,450 ± 60 bp -22.8% per mil	7,590-7,450 BC 7,390-7,370 BC
Beta-213416	Charred material	1,580 ± 50 bp -24.8% per mil	AD 390-600
Beta-213417	Charred material	8,720 ± 60 bp -24.2% per mil	7,960-7,600 BC
Beta-213418	Charred material	1,610 ± 40 bp -22.1% per mil	AD 380-540

* All determinations are corrected for $\delta^{13/12}C$ value; CAMS and Beta are AMS determinations (with the exception of Beta-213416)

3.3 The Artifacts and Features of *Ais Yiorkis*

A variety of cultural materials have been identified at *Ais Yiorkis*, including chipped and ground stone artifacts, faunal remains, botanical remains, picrolite, bone and shell artifacts, charcoal, plaster, and various small finds made from a range of materials. The majority of the raw materials used for the production of tools and ornaments appear to have been easily accessible for the people of *Ais Yiorkis*, with the primary exception of obsidian. The site's location facilitates the collection of such materials and may, at least partially have been chosen specifically for this valuable quality.

The chipped stone assemblage from *Ais Yiorkis* examined for this analysis is quite considerable, numbering over 50,000 pieces, which were recovered through 2004. The assemblage has grown, as subsequent seasons have yielded large amounts of chipped stone as well (in excess of 250,000 pieces). As the lithic analysis is still underway for the 2005-2008 assemblages they will not be discussed here. Further information and statistics detailing the nature of chipped stone assemblage collected from the 1997, 2002-2004 seasons will be provided at length in the following chapters.

The ground stone assemblage, while not nearly as extensive as the chipped stone, is still impressive. Ground stone recovered thus far from *Ais Yiorkis* does not significantly differ from other Aceramic Neolithic sites. The assemblage from *Ais Yiorkis* includes axes (including polished), vessel and bowl fragments, "cupped" stones, and pecking and grinding stones, as well as very large vessel fragments (Simmons 1998a).

The faunal remains recovered from *Ais Yiorkis* rival the chipped stone assemblage in quantity. The entire suite of Aceramic Neolithic subsistence animals have been identified, including small amounts of *Bos.* Flotation has been employed as the primary technique for the recovery of botanical remains. The floatation and analysis of various deposits have revealed differential preservation, but exceptionally well preserved botanical remains have been recovered, and early domesticates including barley, einkorn wheat and a couple of wild grass species have been identified.

Feature 1 (see Figure 13) is the largest most significant in situ feature uncovered thus far at *Ais Yiorkis.* The feature measures approximately four meters in diameter, and appears to represent a circular stone structure or platform. Excavations revealed an impressive flat, "paved" stone surface, which sits atop an apparent mound of stone and soil, which was found to contain very little cultural material. The base of the structure is flanked with very large stones, which were then faced with smaller stones (Simmons 2003). The feature is a structural anomaly on Cyprus as nothing like it has been documented on the island. Although circular architecture is commonplace in the

Cypriot Neolithic, Feature 1 represents more of a platform than a formal structure. Typical Khirokitia and *Tenta* architecture do not exhibit faced floors, but rather consist of hard packed dirt floors. While typical architecture is characterized by well-made stone walls, Feature 1 does not contain evidence of collapsed walls in either stone or mud brick (Todd 1979). The 2004, 2005, 2006, 2007 and 2008 seasons have revealed plaster surfaces, stone walls, and numerous pit features that are currently under investigation. Structures similar to Feature 1 are indicated based on architectural attributes.

A number of small finds have been recovered and recorded from *Ais Yiorkis* fashioned from an assortment of materials, serving a variety of purposes. Picrolite, a soft, pale greenish stone, appears to have been the medium of choice for pieces of ornamentation as well as miscellaneous symbolic, ritual, and/or ceremonial artifacts. A number of picrolite "thimbles" have been recovered since the initial discovery of the unusual artifact type by the CPSP during the 1980 survey (Rupp et al. 1984). The majority of bone artifacts found at *Ais Yiorkis* are awls, although other interesting pieces such as broken bone pins and needle fragments have been identified as well. The most impressive bone artifact recovered during the 2005 season is a polished piece that appears to have been worked into the shape of a bird head, with the eye possibly providing a needle eyelet. Shell artifacts also comprise a percentage of the small finds, including beads or perforated shells, although nothing particularly notable has yet been recorded. Obsidian, although fewer in number (n=16), are among the most significant small finds due to their foreign origin. The obsidian recovered from *Ais Yiorkis* will be discussed with the greater chipped stone assemblage.

The excavations at *Ais Yiorkis* have been meticulously conducted over eight seasons thus far. Each consecutive season has revealed the site in greater detail with excavations exposing additional architectural features as well as artifactual deposits. Individual artifact assemblages and/or types are analyzed and curated according to specific requisites and regulations. Specialists have been solicited to examine various assemblages. Paul Croft is currently examining the faunal remains. David Reese provides his expertise in identifying the shell recovered from the site. Sue Colledge has consulted on the use of floatation and paleobotanical analyses, and Leilani Espinda has published her thesis research related to the botanical remains recovered. Additional research projects exploring various other aspects of the site are in progress. The chipped stone assemblage in particular is the focus of this research, and was analyzed using a detailed typo-technological system that will be discussed in Chapter 4.

CHAPTER 4

METHODS

4.1 Archaeological Methods

The *Ais Yiorkis* Archaeological Project has carried out eight seasons of excavations to date. Although investigations at *Ais Yiorkis* are ongoing, this research focuses only on the first four seasons in order to expedite the research and publication process. The initial 1997 testing project at *Ais Yiorkis* included seven five by five meter surface scrapes (designated S.S. 1, 2, etc.). Two one by one meter sections (Section A and Section B), a one by one meter test pit (T.P. 1), and three, 50cm by 50cm probes were also excavated in 1997.

The more intensive and extensive excavation that took place in 2002 included the development of a five by five meter grid system. Formal excavation units were opened, including the southwest and southeast quadrants of unit 15N15W, and Section D the southwest quadrant of unit 10N15W, as well as a third section (Section C) and two additional one by one meter test pits (T.P. 2 and 3). Excavations of Section D, the SW Quadrant of unit 10N15W revealed the northern edge of Feature 1. Section C, a one by one meter unit, was excavated as a test pit with the intention of expanding excavations into the upper field in order to begin examining the boundaries of the site. Test Pit 2, a one by one meter unit located on the periphery of the modern plow zone at the far terrace edge of the lower field, was tested as surface artifacts were previously collected in this area by other archaeologists informally surveying the area. Test Pit 3 was placed within the modern plow zone in order to look at the effects of site formation processes, to aid in contextual studies, and to further define the extent of the site in the lower field.

The 2003 excavations focused on expanding around Feature 1 from unit 10N15W SW Quadrant, and opened the SE Quadrant of unit 10N20W, the NE and SE Quadrants of unit 5N20W, the NW Quadrant along with Wedge 1 (.85 by 1.36m) and Wedge 2 (1 by 1.5m) of unit 5N15W, all of which revealed the anomalous Feature 1 that will be discussed below. Four small sections were excavated into Feature 1 in order to further investigate its construction and contents. Feature Sections 1, 2 and 3 were placed within unit 5N15W, and Feature Section 4 was within unit 5N20W.

The focus of the 2004 season shifted primarily to the upper field, which now appears to contain the bulk of the site. Three one by one meter test pits, designated T.P. 4, 5 and 6, were excavated in to assess the extent of the site in the upper field. Two test trenches, T.T. 1 unit 25N10W and T.T. 2 unit 20N40W were also opened in order to expose larger areas that were identified as possible archaeological features through resistivity testing. T.T. 1, a four by one meter trench placed within the modern plow zone of the lower field, yielded very little archaeological material throughout the almost three meters in depth excavated. In opposition, T.T. 2, a three by two meter trench located in the upper field revealed abundant archaeological material as well as a pit feature.

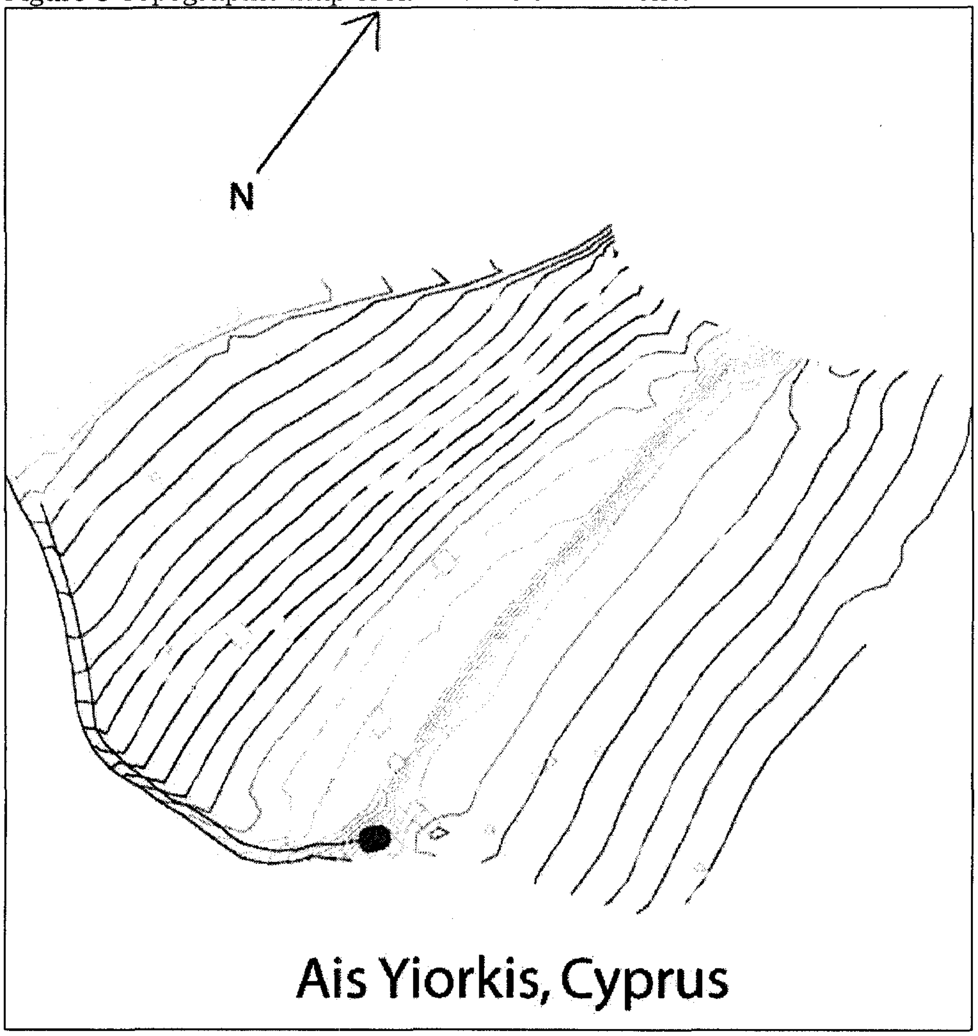
Table 4 *Ais Yiorkis* excavation units.

Quadrant/Subquadrant	Size (m^2)	Year
Probe 1	.5x.5	1997
Probe 2	.5x.5	1997
Probe 3	.5x.5	1997
Surface Scrape 1	5x5	1997
Surface Scrape 2	5x5	1997
Surface Scrape 3	5x5	1997
Surface Scrape 4	5x5	1997
Surface Scrape 5	5x5	1997
Surface Scrape 6	5x5	1997
Surface Scrape 7	5x5	1997
15N20W Section A	1x1	1997
10N15W Section B	1x1	1997
15N20W Section C	1x1	2002
10N15W Section D	1x1	2002
Test Pit 1 10N15W	1x1	1997
Test Pit 2 27N16E	1x1	2002
Test Pit 3 30N01E	1x1	2002
Test Pit 4 20N75W	1x1	2004
Test Pit 5 5N50W	1x1	2004
Test Pit 6 5N45W	1x1	2004
Test Trench 1 25N10W	4x1	2004
Test Trench 2 20N40W	2x3	2004
15N15W SE Quadrant	2.5x2.5	2002
15N15W SW Quadrant	2.5x2.5	2002
5N15W NW Quadrant	2x2	2003
Wedge 1 5N15W SW/NW Quadrant	.85x1.30	2003
Wedge 2 5N15W NW/NE Quadrant	1x1.5	2003
5N20W NE Quadrant	2x2	2003
5N20W SE Quadrant	2x2	2003
10N20W SE Quadrant	2x2	2003
15N25W SE Quadrant	2.5x2.5	2004
10N15W SE Quadrant	2x2	2003
10N15W SW Quadrant	2x2	2003
Feature 1 Section 1 5N15W	1x1	2003
Feature 1 Section 2 5N15W	.3x.1	2003
Feature 1 Section 3 5N15W NE Quadrant	1m Profile	2003
Feature 1 Section 4 5N20W	.5x.5	2003

Table 4 provides information about the units excavated in terms of the given unit type, the location of the unit within the five by five meter grid system, as well as the size of each unit and the year in which it was excavated. The seven surface scrapes, although they were also investigated using a five by five meter unit grid system, along with the three $0.5m^2$ probes were completed during the 1997 survey project and therefore do not fit into the permanent grid introduced during the 2002 field season.

The site plan (Figure 3) below presents a broad picture of the topography of the site, displaying the units, test trenches and test pits that have been excavated through the 2004 season.

Figure 3 Topographic map of *Ais Yiorkis* excavations.



4.2 Artifact Collection and Analyses

The lithic analyses completed on the *Ais Yiorkis* data began with the recovery and collection of chipped stone artifacts in the field. Archaeological methods were designed to excavate based on natural or cultural stratigraphy, if present, or in 10 or 20cm levels. Excavated matrix was sieved through ¼ inch screen, and while this is not among the finest mesh, very small artifacts including shell, microflakes and other chipped stone debris were recovered in very high quantities. Artifacts were collected and bagged according to type (i.e., bone, chipped stone, shell), and were then assigned a field number (FN) that ties the artifacts to the unit and level from which they were recovered. After being transported to the laboratory at Palaipaphos Museum in Kouklia all artifacts were checked in and separated for specialized analysis based on the nature of the assemblage. Chipped stone pieces were systematically washed with water and soft bristle brushes and were laid to dry before further analyses would commence. After having been cleaned, chipped stone artifacts underwent a number of analyses, where a variety of attributes were recorded. The lithic analyses conducted on the *Ais Yiorkis* assemblage was performed by Alan Simmons and the present author, with the assistance of several project participants as recorders and counters. All chipped stone artifacts were analyzed and recorded through the examination of metric and non-metric attributes. Lithic artifact attributes (discussed in detail below) were recorded based on a specialized techno-typological system specifically designed for Cypriot chipped stone analyses that has previously been used at Kholetria *Ortos* (Simmons 1994a, b, 1996), Kannaviou *Kochina* (Simmons 1998a) and Akrotiri *Aetokremnos* (Simmons 1999: 123-146). In turn these were based on common systems used throughout the Near East (e.g., Marks 1976, Kozlowski and Gebel 1996, Tixier 1963, Inizan et al. 1999). All analyses were performed during the field season, thereby allowing the artifacts to be properly curated and stored in the museum facilities before the completion of the project each season. The quantitative and qualitative data collected from all four seasons has been entered into the statistical program SPSS ("Statistical Package for the Social Sciences"), which allows the data to be easily accessed, maintained and updated, and allows for complex statistical analyses to be performed.

4.3 Chipped Stone Typology and Technology

The chipped stone analysis used in the evaluation of the *Ais Yiorkis* assemblage incorporates the use of both technological and typological attributes in order to collect a comprehensive and comparable data base for the evaluation of the artifacts, the site, and the site's Aceramic Neolithic inhabitants. The chipped stone analyses begin with the initial lithic sort in which each piece was examined independently and categorized (see Table 5). The first step of the initial analysis is the identification of a piece as a tool, a core, debitage or debris.

Table 5 Initial lithic sort definitions.

Tool	Any piece displaying retouch that was created either via intentional production or through use.
Core	Any piece displaying evidence of intentional raw material reduction for the purpose of removing blanks for use in tool production. Includes: cores and core fragments (i.e., broken cores).
Debitage	Any piece that was removed from a core that represents a blank, which has the potential for use as a tool. Includes: flakes, blades, bladelets, microflakes, core trimming elements, and core tablets.
Debris	Any piece of shatter or angular fragment that was removed or broken off during core reduction. Includes: chips and chunks.

4.3.1 Attributes

Further discriminating examination distinguishes each piece so that different types of artifacts may be analyzed accordingly. Attribute analyses were then conducted on specific categories, as will be discussed later. This system is essentially reductive in technology and descriptive in typology, building on many years of detailed Near Eastern lithic studies.

4.3.1.1 Blank Type

All debitage and tools were examined and identified based on their blank type. Blank type identifies one of the most basic characteristics of a piece (primarily flakes and blades). Debitage blades and flakes are further categorized and are primarily defined by their blank types based on reduction stage (e.g., primary, secondary, or tertiary flake). Tools are also identified by blank type, but are primarily defined by their tool class (e.g., scraper) (see Table 6).

Table 6 Blank type definitions.

Blank	The type of piece on and/or from which a tool is made. Includes: primary flakes, secondary flakes, tertiary flakes, primary blades, secondary blades, and tertiary blades, bladelets, core trimming elements, core tablets, burin spalls, indeterminates, and rarely cores.
Flake	Those pieces that exhibit a proximal end with a platform and a distal end, but are not double in length than width.
Blade	Those pieces that exhibit a proximal end with a platform and a distal end, but are twice as long as they are wide; often, but not always displaying parallel scars/arrises on the dorsal face.
Primary	Those blades and flakes exhibiting 50% of the original cortex or greater.
Secondary	Those blades and flakes that exhibit between 49 and 1% of the original cortex.
Tertiary	Those blades and flakes that do not exhibit any cortex.
Bladelets	Blades that are less than 12mm in width (Tixier 1963). No maximum length was applied.
Microflakes	Flakes that are less than 15mm in length and width
Core trimming elements	Those pieces with characteristic features including a triangular cross section and blade-like dimensions, typically with two sides displaying scars left from earlier blade removal. These pieces represent the rejuvenation of a core through the removal of a blade-like piece to prepare a new platform allowing for maximum Exploitation of a core.
Core tablets	Those pieces that exhibit a tabular shape with evidence of previous blade and flake removals on the edges represent the rejuvenation of a core.
Burin spalls	Those pieces characterized by their typically narrow but thick flake or bladelet properties, often displaying a hinged end. These pieces were removed for the purpose of producing a burin tool (or for use as a tool).
Indeterminate	Those pieces that do not display any or enough characteristics to allow them to be identified as a specific blank type.

Those pieces identified by blank as flakes or blades were initially sorted based on the amount of dorsal cortex present, as well as whether they were complete or broken. While the primary defining characteristics for flakes and blades include the presence of both a proximal and distal end, the identification of broken flakes and blades was largely possibly despite missing attributes. Those broken pieces that were not discernible were categorized as debris. The tallied numbers and percentages that reflect the presence and/or amount of cortex may or may not be skewed by broken pieces as the determination can only be made based on the portion present (for discussion see Sullivan and Rozen 1985). It is also important to note that cores can also represent blanks, although the blank type core is reserved for use in tool blank identification, as tools are very occasionally made from cores.

Some debate surrounds burins and burin spalls as some researchers view burins as tools themselves and others view them as the waste left over from tool production, and consider the spalls to be the desired end products, potential tools useful for their small needle-like qualities (Inizan et al. 1999). In this analysis burin spalls that display retouch or utilization were identified as tools on a burin spall blank (n=7).

4.3.1.2 Platform and End Types

The platform and end types were identified and recorded on a number of pieces for the purpose of looking at core reduction mechanics and blank production. Platform and end types were identified for all complete flakes and blades. A sample of bladelets and core trimming elements were analyzed for the present attributes regardless of complete status. All tools were examined for the presence of a platform and/or end, and the identifiable attributes were recorded.

The type of platform or butt present was identified and recorded for all tools and pieces of debitage exhibiting a platform. Platform type is defined as the remaining portion of the original striking platform that was struck when the piece was removed from the core. The platform types identified among the *Ais Yiorkis* assemblage include single (plain/flat/unfaceted), dihedral (faceted), punctiform, multiple (multifaceted), crushed, cortical, and indeterminate, and are defined in Table 7 below. Such types are important attributes to identify, as each platform type is indicative of the method of core reduction, involving specific actions of preparation, and may represent a certain point in the "chronology" of the reduction of a core.

Table 7 Platform type definitions.

Single	Those pieces exhibiting the presence of one platform scar.
Dihedral	Those pieces that exhibit two negative scars that were present on the core platform prior to the removal of individual pieces.
Punctiform	Those pieces exhibiting a very small circular striking surface, and are quite distinct.
Multiple	Those pieces exhibiting three or more negative scars remnant of the core.
Crushed	Those pieces identified based on the "crushed" remnants of what was a platform before the piece was struck from the core.
Cortical	Those pieces characterized by the presence of the original raw material cortex on the platform.
Indeterminate	Those pieces that were not identifiable as belonging to one of the established types and were considered non-distinct.

The end type (termination) represents the major characteristic of the distal end of a flake, blade, or bladelet, where it ultimately separated from the core. The end types that have been identified among the *Ais Yiorkis* assemblage include pointed, blunt, hinged, overshot (plunging or outrepassé), feathered, impact fracture, and indeterminate, and are listed and defined below in Table 8. Like platform type, end type has further applications beyond classification. End type reveals how the piece came off the core, and may be indicative of the skill of the pre-historic flint knapper.

Table 8 End type definitions.

Pointed	Those pieces with ends that terminate in a relative point.
Blunt	Those pieces that exhibit flat, dull distal ends.
Hinged	Those pieces exhibiting a distal termination that is characteristically smooth and rounded off, and is easily identifiable.
Overshot	Those pieces recognized by the curving of the piece inward towards the ventral side and the distal end of the core from which it was removed.
Feathered	Those pieces identified by the characteristic graded end, going from thick in the center of the piece to very thin at the termination.
Impact Fracture	Those pieces that display crushing at the distal end, and have generally been classified as projectile points
Indeterminate	All pieces exhibiting characteristics that are not representative of the other defined types and are considered non-distinct.

4.3.1.3 Retouch Type

Retouch type codes are used to identify the extent of retouch, or human modification to the edge of a piece of chipped stone. The presence of retouch is what defines a tool. Retouch can occur in two ways, through pressure flaking using a piece of antler, bone, or wood to apply pressure to the edge of the intended tool, or through the actual use of the piece for a purpose. The types of retouch that have been identified at *Ais Yiorkis* include marginal, semi-steep, steep (Ouchtata), abrupt (backing), invasive (flat invasive), scalar, bifacial, full-invasive, and tip (projectile points) are listed and defined below in Table 9. These retouch types have generally been designed and designated based on a gradation or scale, following Marks (1976). Notably, both full-invasive and tip retouch are rare among the assemblage.

Table 9 Retouch type definitions.

Marginal	The lightest retouch with the shortest extent into a piece. In some cases marginal retouch may represent use wear rather than intentional retouch, but no distinction was made for the purposes of this research.
Semi-steep	More obviously intentional retouch, but with a short extent into a piece.
Steep	Retouch with a longer extent at gradual angle into the piece.
Abrupt	Retouch characterized by a flat quality, displaying an almost 90 degree angle to the edge and is primarily associated with backed pieces.
Invasive	Very deep retouch, extending well past the edge of a piece, with a low angle, and is typically used to describe scraper retouch.
Scalar	Retouch characterized by extensive battering in place of formal retouch.
Bifacial	Retouch generally is long in extent into a piece as invasive scraper retouch, but occurs on both sides of an edge.
Full-Invasive	Retouch that extends across most if not all of one face a given piece.
Tip (Points)	Retouch identified by its location on the tip of a pointed end.

4.3.1.4 Raw Material

In the 2003 field season raw material type was added to the lithic analyses attribute list, therefore only a sample of the assemblage has been analyzed for material type. The material types that have been identified at *Ais Yiorkis* include the geologically based raw material types, translucent, Lefkara translucent, Lefkara basal, Moni, Lefkara dense translucent, chalcedony, obsidian, and red and green jasper. The type "other" was included for those pieces that were not identifiable as one of the established, known types, and represent only a small percentage of the sample. The raw material typology employed here was borrowed directly from McCartney via personal communication and has been used by her in the analyses of contemporary sites in Cyprus, including Kalavasos *Tenta* (McCartney and Todd 2005).

4.3.1.5 Other Attributes

All chipped stone was examined in order to determine whether or not it was exposed to heat to the point of exhibiting signs of burning. The evaluation of burnt pieces was based on the overall appearance and feel of each piece and was recorded as "yes", "no", or "indeterminate". Characteristic evidence of burning include discoloration, pot lidding, and crazing, often in conjunction with a soapy feel (Crabtree and Butler 1964, Whittaker 1994). Evaluating whether or not pieces were burned aids in the identification of midden areas and hearths at the site. The presence of burned chipped stone may also account for breakage and discard patterns. Overall, the assemblage does not exhibit signs of intentional burning or heat treating of raw materials for the purpose of production.

As discussed above, pieces were identified as complete or broken. Obviously the condition of chipped stone pieces upon archaeological recovery may not represent the state of the piece upon initial burial in prehistory. Many taphonomic processes, forces of nature, as well as human development have acted upon the land and have therefore influenced the current state of the artifacts found within it. Animal grazing, human plowing, and even rain wash have affected the prehistoric deposits, accounting for a percentage of the broken and even retouched pieces that are later excavated and analyzed. Despite the 9,000 year time lapse between interment and recovery, the state in which each piece is recovered is important to discuss, although the majority of debitage analyses focus on complete pieces. The *Ais Yiorkis* chipped stone assemblage as a whole is generally considered "fresh" with sharp edges and very little patination, although some calcium carbonate had accrued on portions of the assemblage, but was largely removed during washing. The overall state of the artifacts indicates that the site has been subject to very little disturbance.

4.3.2 Debris Analysis

Debris or shatter is easily identifiable as the majority of pieces are relatively small, "chunky," and angular in appearance, and generally unsuitable for further modification into tools. Debris includes all chipped stone that does not display identifiable characteristics of a flake or blade, and therefore does not exhibit a defined platform or end. Debris are typically angular in shape and do not represent cores. Debris represents those pieces of chipped stone that were removed and discarded in the process of core reduction or were produced post-occupationally through plowing or mechanical intervention. During the initial sort, debris was separated from the other types of objects, and was then divided into two sub-types based on size, namely, "chunks" and "chips". Debris chunks are defined as those pieces of debris that are greater than 15mm in size. Debris chips are defined as those pieces of debris that are less than or equal to 15mm. All of the chunks and chips identified were counted, bagged, and weighed according to field number.

4.3.3 Debitage Analysis

In the analysis of the *Ais Yiorkis* chipped stone assemblage, debitage was defined as any chipped stone piece that did not exhibit obvious retouch or use as a formal tool, and did not represent a core or core reduction debris (i.e., shatter). Debitage thus is comprised of blanks that can be modified for the manufacture of tools. All of the debitage recovered from the site from the 1997 and 2002-2004 seasons was examined and systematically analyzed. Initial sorting of individual chipped stone field numbers (FN) separated the debitage from the cores and tools, and allowed each piece to be identified as a particular blank type as discussed above. Debitage is categorized based on metrics to differentiate between a blade, a flake, a bladelet, or a microflake. Burin spalls, core trimming elements, and core tablets are also identified as debitage, but are not categorized based on metric attributes, but rather are identified based on physical/technological characteristics. Core rejuvenation pieces include only core trimming elements and core tablets in this analysis.

The total number of pieces designated as specific blank types (i.e., complete tertiary blades or broken primary flakes) were counted and recorded. Complete blades and flakes, as well as bladelets were analyzed in greater detail with debitage blank type recorded, along with other notable attributes, including, platform type, end type, whether or not there was evidence of burning, and a limited sample was coded for material type. Metrics specifying length, width and thickness were also recorded for all complete debitage. All measurements represent the center most point of the dimension. It is of note that the width defining bladelets may not be the width at midpoint recorded. In order to ensure that all bladelets have a maximum width of 12mm the maximum was used to categorize each piece as a bladelet, but the midpoint was later recorded for width.

4.3.4 Tool Analysis

Those pieces identified as tools were analyzed in the greatest amount of detail. Tools include all of those pieces that exhibit some form of intentional retouch or incidental retouch via usewear as discussed above. The identification of a tool is based on the presence of retouch and is then further classified based on the extent and invasiveness of that retouch. Tools are evaluated on an individual basis and are categorized into classes and types using well-established Near Eastern criteria and are categorized in a techno-typological fashion.

Class is the primary category by which each tool is identified. The tool classes identified among the *Ais Yiorkis* assemblage include, projectile points, piercing tools, scrapers, burins, notches, denticulates, serrated pieces, knives, sickles/glossed pieces, truncations, tanged pieces, backed pieces, microliths, retouched blades, retouched flakes, axes, varia, tool fragments, bifaces, unifaces, and *Ortos* crescents. Within each class a number of more specific tool types were identified. While each tool has been identified for class (e.g., scraper) and type (e.g., end scraper), which have been standardized, it is important to note that tools are not forced into classes and types and that the varia class allows for multiple tools and odd pieces to be recognized and appropriately categorized. Tool classes and types are discussed in greater detail in Chapter 5.

Length, width and thickness were recorded for each tool, depending on which measurements were present and complete. A number of specific attributes were recorded for tools, including tool class and type, blank type, platform type, end type, retouch type, whether each piece was burnt or not, whether or not each piece was complete or broken, and a limited, but significant sample were recorded for material type.

4.3.5 Cores

Typically cores recovered from archaeological contexts represent the types of blanks that were desired, as well as the skill, and technological knowledge and/or background of the flintknapper. The cores recovered from *Ais Yiorkis* were analyzed for type, as well as metric attributes. The 26 core types identified among the assemblage are presented in Table 10 below. Each core was also evaluated to determine whether or not it was "exhausted", or used to the point of exhaustion where further reduction was no longer possible and/or desirable. Like the debitage and tools, cores were examined for burning, and material types were recorded for the 2003 and 2004 seasons. The cores will be discussed in detail in Chapter 5.

Table 10 Core types.

Flake Cores	Material Test Flake, Single Platform Flake, Multidirectional Flake, Globular Flake, Bidirectional Flake, Opposed Platform Flake, Pyramidal Flake, Discoidal Flake, Sub-Discoidal Flake, 90 Degree Flake, Sub-Pyramidal Flake, Spheroidal Flake, Akrotiri Flake, Core on Flake, Tabular Flake
Blade Cores	Single Blade, Naviform Blade, Sub-Naviform Blade, Opposed Blade, 90 Degree Blade, Core on Blade, Bladelet
Core Fragments	Flake, Blade, Bladelet, Indeterminate

4.4 Sampling

The overall assemblage from the four seasons considered here (1997, 2002-2004) totals over 51,000 pieces. Every single piece in the assemblage was examined and classified at the most basic level. This primary lithic sort identified each individual piece as a tool, core, core trimming element, core tablet, burin spall, debris (chip or chunk), a complete or broken primary, secondary or tertiary flake or blade, microflake, or bladelet. Once an assemblage was sorted a count was tallied for each of the categories and a total lithic sort number was reached for that Field Number. Beyond this basic sort, samples were further analyzed for additional attributes. While the ideal would be to examine each piece for any and all attributes, a variety of factors limited such an extensive analysis.

Although it was necessary to rely on samples of chipped stone artifacts in many cases, these samples should still be considered representative as in all discussions they represent the vast majority of the pieces collected. The 1997 season was limited in terms of testing and excavation and even more so in terms of analysis, and my involvement in the project did not begin until 2002, therefore the entire suite of attributes discussed here were not recorded prior to 2002. Specifically, the 1997 season did not identify raw material type or retouch type (although as scrapers are defined by their retouch type, therefore type could be assigned post-analysis). It should be noted that the fewest number of artifacts (n=2,013) were recovered from this season due to the short season. The units tested during the 1997 season were returned to and more extensively researched in the subsequent seasons discussed here, therefore additional data was acquired related to chipped stone recovered from these areas.

As the *Ais Yiorkis* Archaeological Project combined field and study/ analysis each season, and the chipped stone analysis preformed here is quite exhaustive not all artifacts could be analyzed the season of collection. Restrictions related to accessing unanalyzed collections from previous seasons housed in the museum created limitations. Again, all of the of chipped stone artifact bags (by unit/level) were initially sorted and counted, and the vast majority underwent detailed analyses but some fell through the cracks so to speak and were inaccessible or missed for further study. Despite the need for sampling, the studies related to intra-site distribution and inter-site comparison rely primarily on the basic lithic sort discussed above therefore are not samples, but rather represent the numbers and percentages for the entire assemblage.

4.5 Summary

The chipped stone analysis of the *Ais Yiorkis* assemblage was intentionally specific and represents an outward attempt to be comprehensive by examining many aspects of the assemblage. The purpose of such research is foremost to present an accurate and useful characterization of the assemblage, which is especially important for *Ais Yiorkis* as it represents a "new culture." Such detail will be particularly useful for comparisons with other Cypriot and even mainland assemblages. Chapter 5 provides this detailed account. It is important to note that although a variety of analyses have been performed, research on the *Ais Yiorkis* chipped stone assemblage continues.

CHAPTER 5

THE CHIPPED STONE ASSEMBLAGE

5.1 Introduction

As noted previously, the CPPNB is a recently defined phenomenon, and one goal of this thesis is to provide a very detailed descriptive analysis of the entire chipped stone assemblage so that "base-line" data can be established. This chapter provides such a detailed characterization of the entire chipped stone assemblage collected from Kritou Marottou *Ais Yiorkis* in 1997 and between 2002 and 2004. This representation of the assemblage will be portrayed through statistics and is the most comprehensive database for the *Ais Yiorkis* chipped stone assemblage processed and analyzed thus far. An overview of the entire assemblage will first be provided, followed by specifics for each artifact type. Tools, cores, debitage and debris will be considered independently of one another as well as in conjunction with and in comparison to one another when common attributes can be discussed.

The chipped stone artifacts collected during the 1997, 2002, 2003, and 2004 seasons number 51,240 pieces. This total includes all such materials recovered from the site, ranging from large cores and raw material tests to tiny pieces of debris and microflakes. All chipped stone artifacts excavated and returned to the lab were identified and counted. The tools, cores and debitage underwent more specific analyses. The assemblage consists of 2,386 tools, 449 cores, 28,036 pieces of debitage, and 20,367 pieces of debris (see Table 11).

Table 11 Chipped stone summary.

	n	%
Tools	2,386	4.7
Cores	449	0.9
Debitage	28,036	54.7
Debris	20,367	39.7
Total	51,240	100

5.2 Debris

As previously discussed, debris represents the unidentifiable fragments and/or reduction shatter recovered among chipped stone assemblages in archaeological contexts. With almost 40% of the entire assemblage, the amount of shatter suggests intensive core reduction occurring on-site at Ais Yiorkis (Sullivan and Rozen 1985). Notably, pieces of debris are rarely used in tool production, and in the case of the *Ais Yiorkis* assemblage have not been recorded as tool blanks to date. Such angular debris, further classed as chips (less than 30mm in size) and chunks (greater than 30mm) constitute 39.7% of the entire assemblage. The size differentiation between chips and chunks, while seemingly arbitrary can provide information about the types of reduction processes, as well as post depositional breakage and raw material fracture mechanics. Chips represent 18,188 pieces or 35.5% of the entire assemblage and 89.3% of debris, while chunks represent only 2,179 pieces or 4.3% of the assemblage and 10.7% of debris. A sample of 19,395 pieces of debris (95.2%) was recorded for weight (see Table 12). The total weight of the chip sample (17,366 pieces) equals 18,075 grams, while the chunk sample (2,029 pieces) totals 21,184 grams. The number of pieces to weight difference between chips and chunks exists for obvious reasons. The average weight of chips equals only 1.0 grams, with chunks averaging 10.4 grams.

Table 12 Debris totals and weight in grams.

	Sample n	Weight	n	%
Chips	17,366	18,075	18,188	89.3
Chunks	2,029	21,184	2,179	10.7
Total	19,395	21,184	20,367	100

Looking at the assemblage in terms of basic chipped stone types, chips constitute the majority of the pieces recovered. The high quantities of small, angular, technologically indistinct debris probably reflect late stages of core reduction and tool production occurring at the site. The amount of debris can be said to infer that the earliest stages of reduction, during which cores were roughed out of raw material nodules, may have occurred on site as well. The presence of greater amounts of smaller debris is largely indicative of later stages in the reduction process occurring on site. The possibility that debris represents more modern products of post-occupational mechanics (i.e., plowing) is yet another option for the high quantity of debris. These possibilities will be discussed in greater detail in Chapter 6 when context and distribution is detailed. Although the debris assemblage is very significant at *Ais Yiorkis,* it is not overly diagnostic in terms of trends in reduction and production. Platform and end attributes are not present on debris, and the vastness of the assemblage did not facilitate the further analysis of debris for material type, burning, or specific metric measurements such as length, width and thickness. The debris will not be included in the greater assemblage totals in order to discuss trends in attributes for much of the following analysis.

5.3 Debitage

The chipped stone pieces classified as debitage number 28,036 and include non-retouched flakes and blades, bladelets, microflakes, burin spalls, and the core rejuvenation products, core trimming elements and core tablets. Such pieces generally represent the desired end products of core reduction, including blanks from which tools are fashioned. Debitage constitutes 54.7% of the entire assemblage, 90.8% when debris is omitted. Among the debitage, flakes are the most frequently occurring blank type, comprising 16,868 or 60.2% of all debitage. Blades are the second most common blank type numbering 5,851 or 20.9%. Microflakes (3,382 pieces, 12.1%) and bladelets (1,643 pieces, 5.9%) were also among the debitage, although in lesser quantities, with very small numbers of burin spalls, core trimming elements and core tablets (See Table 13).

Table 13 *Ais Yiorkis* debitage tally.

Debitage Type	n	%
Flakes	16,868	60.2
Blades	5,851	20.9
Microflakes	3,382	12.1
Bladelets	1,643	5.9
Burin Spalls	145	0.5
Core Trimming Elements	122	0.4
Core Tablets	25	0.1
Total	28,036	100

During the analysis, the flakes and blades were looked at specifically for the percentage of cortex present on the dorsal surface, and were categorized as primary (100% to 50%), secondary (49% to 1%) and tertiary (0%). When examining the debitage assemblage in terms of reduction, tertiary flakes are the most commonly occurring, numbering 13,905, 49.6% of debitage, and 82.4% of flakes (See Table 14). Although there are far fewer tertiary blades than tertiary flakes, they are second in number, and are still significant with 4,991 pieces, or 17.8% of the debitage assemblage, and 85.4% of blades. Notably, primary flakes number just 387 or 1.4%, and primary blades, with 53 pieces, make up a mere 0.2% of the debitage. These numbers seem to indicate that raw material nodules were pre-formed into cores before being brought to the site for further reduction and tool production. The trend in the relative size of pieces based on position in the reduction sequence (e.g., cortical flakes are usually larger than tertiary flakes, discussed below) along with cortical pieces recovered in minute quantities, may simply reflect the natural order of reduction (Bradbury and Carr 1995, Magne 1985).

Table 14 Debitage tally by type.

	n	%
Tertiary Flakes	13,905	49.6
Tertiary Blades	4,997	17.8
Microflakes	3,382	12.1
Secondary Flakes	2,576	9.2
Bladelets	1,643	5.9
Secondary Blades	800	2.9
Primary Flakes	387	1.4
Burin Spalls	145	0.5
Core Trimming Elements	122	0.4
Primary Blades	54	0.2
Core Tablets	25	0.1
Total	28,036	100

5.3.1 Flakes

A total of 3,490 flakes were complete, while 13,378 were broken. Of the complete flakes a sample of 3,408 pieces were analyzed for metric and qualitative attributes (see Table 15). The average length of all of the flake debitage is 29.3mm, with a minimum of 6.7mm and a maximum of 93.9mm. The average width is 25.5mm, with a minimum of 8.9mm and a maximum of 142.8mm. The average thickness of the flake sample is 6.3mm, with a minimum of 1.0mm and a maximum of 28.9mm. Among the flake sample, tertiary flakes (n=2,650) were found to be the smallest, with an average length of 27.4mm, average width of 23.8mm, and thickness of 5.7mm. The complete secondary flakes (n=631) were found to average 35.8mm in length, 31.1mm in width, and 8.2mm in thickness. The complete primary flakes (n=127) sample proved to be the largest pieces, with the average length at 35.9mm, the average width was 34.5mm, and the average thickness was 9.6mm.

Table 15 Average length, width and thickness of the flake sample.

Flake type	Length in mm	Width in mm	Thickness in mm
Tertiary Flake	27.4	23.8	5.7
Secondary Flake	35.8	31.1	8.2
Primary Flake	35.9	34.5	9.6
All Flakes	29.3	25.5	8.9

Among the flake sample the most commonly occurring platform type is single, identified on 1,567 pieces (46.0%) (see Table 16). Single platforms are generally indicative of simple reduction practices, lacking intense platform preparation. Crushed platforms are the second most common type with 695 pieces (20.4%), which can either indicate hard hammer percussion or post-use or depositional damage. Lesser percentages of dihedral, multiple, cortical and punctiform platforms were identified, and on a small percentage of flakes, the platform was found to be unidentifiable. Low percentages of cortical platforms reveal a tendency towards prepared platforms.

Table 16 Platform types on flakes.

	n	%
Single	1,567	46.0
Crushed	695	20.4
Dihedral	519	15.2
Multiple	246	7.2
Cortical	170	5.0
Punctiform	136	4.0
Unidentifiable	75	2.2
Total	3,408	100.00

Hinged is the most common end type among the flake sample at 1,382, 40.6% (see Table 17). Interestingly hinged ends have been interpreted as indicative of an "accident" that may have occurred during knapping and/or that a beginner knapper was involved in production (Inizan et al. 1999: 36). Blunt ends are second most common with 1,153 or 33.8%.

Table 17 End types identified within the flake sample.

	n	%
Hinged	1,382	40.6
Blunt	1,153	33.8
Feathered	589	17.3
Overshot	211	6.2
Pointed	65	1.9
Indeterminate	7	.2
Impact Fracture	1	.0
Total	3,408	100.00

Of the sample of 3,348 complete flakes coded for burning, the vast majority, 88.0% were found to show no evidence of burning, while 11.9% had clear evidence of burning and 0.1% were coded indeterminate (see Table 18). Only 7.9% of primary flakes were found to exhibit signs of burning, 11.4% of secondary flakes, and 12.2% of tertiary flakes (see Table 19).

Table 18 Evidence for burning among the flake sample.

	n	%
Not burned	2,945	88.0
Burned	399	11.9
Indeterminate	4	.1
Total	3,348	100.00

Table 19 Burning by reduction level within the flake sample.

	Primary	Secondary	Tertiary
% Not Burned	92.1	88.4	87.6
% Burned	7.9	11.4	12.2
Indeterminate	0.0	0.2	0.1

A total of 2,361 flakes were analyzed for material type. Lefkara basal was by far the most prevalent material type among the flake assemblage sampled, with 1,879 pieces or 79.6%. Among the primary flakes, Lefkara basal constitutes 87.9% with only two other materials identified, Lefkara translucent with 9.1% and translucent with 3.0%. Secondary flakes are also dominated by Lefkara basal with 77.2%, along with a lesser, but more significant percentage of Lefkara translucent, 17.2%, as well as 5.1% translucent, and 0.6% chalcedony. The tertiary flakes show a greater range of raw materials, although 79.8% were identified as Lefkara basal, 12.4% were Lefkara translucent and 6.7% were translucent, lesser percentages of Moni, chalcedony, and jasper were also identified (see Table 20).

Table 20 Percentages of raw material types among flakes by reduction.

	Primary	Secondary	Tertiary
Lefkara Basal	87.9	77.2	79.8
Lefkara Translucent	9.1	17.2	12.4
Translucent	3.0	5.1	6.7
Chalcedony	0.0	0.6	0.6
Moni	0.0	0.0	0.4
Jasper	0.0	0.0	0.1
Total	100	100	100

The presence of more varied raw materials among the tertiary flakes can be indicative of the difficulty that can accompany the identification of differential cortical material, and/or the active choice or need to bring only tertiary, preformed materials to the site that are either non-local or less available.

5.3.2 Blades

Of the blades, 5,033 were identified as complete and 818 were broken. A sample of 807 complete blades were analyzed in more detail for quantitative and qualitative attributes. The average length of the complete blade sample is 51.7mm, with a minimum of 22.6mm and a maximum of 127.1mm (see Table 21). The average width is 19.8mm, with a minimum of 12.0mm and a maximum of 44.0mm. The average thickness is 6.5mm, with a minimum of 1.5mm and a maximum of 23.1mm. Among the blade sample tertiary blades (n=530) were marginally found to be the smallest, with an average length of 51.1mm, average width of 19.0mm, and thickness of 6.2mm. The complete secondary blades (n=255) were found to average 53.1mm in length, 20.5mm in width, and 7.3mm in thickness. The complete primary blades (n=22) sample proved to be the largest pieces, with an average length of 52.6mm, an average width of 20.5mm, and an average thickness of 9.0mm.

Table 21 Blade sample average length, width and thickness.

Blade type	Length in mm	Width in mm	Thickness in mm
Tertiary Blade	51.1	19.0	6.2
Secondary Blade	53.1	20.5	7.3
Primary Blade	52.6	20.5	9.0
All Blades	51.8	19.5	6.6

The most commonly occurring platform type among the blade sample (n= 807) is single, with 371 (46.0%) (see Table 22). Single platforms tend to indicate a more simplistic reduction process involving a unidirectional core. Crushed platforms are the second most common type with pieces (22.8%), which can either indicate the implementation of hard hammer percussion or post-depositional crushing/breakage.

Table 22 Platform types on blades.

	n	%
Single	371	46.0
Crushed	184	22.8
Dihedral	83	10.3
Punctiform	55	6.8
Multiple	43	5.3
Cortical	36	4.5
Unidentifiable	35	4.3
Total	807	100

Among the blade sample, blunt is the most common end type at 43.6% (n=352) (see Table 23). Hinged ends are second most common at 26.5% (n=214). Other end types were identified in lesser quantities.

Table 23 End types identified within the blade sample.

	n	%
Blunt	352	43.6
Hinged	214	26.5
Pointed	118	14.6
Feathered	87	10.8
Overshot	36	4.5
Total	807	100

Of the samples of 741 blades that were examined for evidence of burning, only 8.5% were identified as burnt, with 91.5% not (see Table 24). Among the primary blades, 4.5% showed signs of burning, 12.4% of secondary, and 6.7% of tertiary blades identified as burnt (see Table 25).

Table 24 Evidence for burning among the blade sample.

	n	%
Not Burned	678	91.5
Burned	63	8.5
Total	741	100

Table 25 Burning within the blade sample by reduction.

	Primary	Secondary	Tertiary
% Not Burned	4.5	12.4	6.7
% Burned	95.5	87.6	93.3
Total	100	100	100

A sample of 568 blades were analyzed for material type. The most commonly used material in the production of blades was Lefkara basal at 73.4%, followed by Lefkara translucent with 15.7% and translucent with 10.2%. Small percentages of chalcedony, Moni and obsidian were also recovered.

All of the primary blades (n=18) that were analyzed for material type were identified as Lefkara basal, while materials were more diverse among the secondary blades, with 71.9% Lefkara basal, 19.1% Lefkara translucent, 9.0% translucent. The tertiary blade assemblage showed the most variation in raw materials with 73.0% Lefkara basal, 14.5% Lefkara translucent, 11.4% translucent and minimal quantities of chalcedony, Moni and obsidian (see Table 26).

Like the flake sample, the greater variety of raw material types among the tertiary blade assemblage can indicate difficulty identifying cortical material on some material types or, more likely, the decision or need to transport only pre-formed non-local and/or less available materials to the site.

Table 26 Percentages of raw material types among blades by reduction.

	Primary	Secondary	Tertiary
Lefkara Basal	100.0	71.9	73.0
Lefkara Translucent	0	19.1	14.5
Translucent	0	9.0	11.4
Chalcedony	0	0	0.6
Moni	0	0	0.3
Jasper	0	0	0.3
Total	100	100	100

5.4 Cores

A wide range of types were identified among the 449 cores recovered from *Ais Yiorkis*. The cores represent 0.9% of the entire chipped stone assemblage, 1.5% of the restricted assemblage minus debris. The most common core types are globular flake cores numbering 68 pieces or 15.1% of the cores, fragment flake cores numbering 67 or 14.9%, and multidirectional flake cores at 63 pieces or 14%. Overall, flake cores, including globular, flake fragments, multidirectional, Akrotiri, spheroidal, discoidal, cores on flakes, sub-discoidal, single platform, material tests, bidirectional, sub-pyramidal, opposed platform, 90 degree, pyramidal, and tabular, represent the majority of the assemblage at 338 pieces or 75.3% of all cores. Notably, blade cores, including single platform, naviform, sub-naviform, opposed platform, cores on blades, blade core fragments, 90 degree and multidirectional blade cores represent a much smaller percentage of the core assemblage at 72 pieces or 16.0% of the assemblage. Even fewer are bladelet cores and bladelet core fragments with 31 or 6.9% and indeterminate fragments with 8 or 1.8% of the cores (see Tables 27 and 28).

Table 27 Cores by type.

Core Types		n	%
Flake Cores	Globular Flake	68	15.1
	Flake Fragment	67	14.9
	Multidirectional Flake	63	14.0
	Akrotiri Flake	36	8.0
	Spheroidal Flake	23	5.1
	Discoidal Flake	20	4.5
	Core on Flake	14	3.1
	Sub-Discoidal Flake	13	2.9
	Single platform Flake	10	2.2
	Material test Flake	6	1.3
	Bidirectional Flake	6	1.3
	Sub-Pyramidal Flake	4	0.9
	Opposed Platform Flake	3	0.7
	90 degree Flake	3	0.7
	Pyramidal Flake	1	0.2
	Tabular	1	.2
Blade Cores	Single Blade	28	6.2
	Blade Fragment	22	4.9
	Opposed Blade	12	2.7
	90 degree Blade	4	.9
	Naviform Blade	3	.7
	Sub-Naviform	2	.4
	Core on blade	1	.2
Bladelet Cores	Bladelet	26	5.8
	Bladelet Fragment	5	1.1
Indeterminate Fragment		8	1.8
Total		449	100.0

Table 28 Core totals between blades, flakes, bladelets and indeterminate fragments.

Core Types	n	%
Flake Cores	338	75.3
Blade Cores	72	16.0
Bladelet Cores	31	6.9
Indeterminate Fragment	8	1.8
Total	449	100

Of the 347 whole cores (non-fragmented) a sample of 330 were evaluated for exhaustion. A total of 179 or 54.2% were identified as exhausted or were used to the point of exhaustion, while 151 or 45.8% were not exhausted and therefore represent viable cores (see Table 29). The relative equality in the percentages of exhausted and not, showing that while half of the lost, discarded or left behind cores were reduced to such an extent that they were no longer valuable, the other half could still yield useful blanks, reveals that raw material availability must have been reasonably high.

Table 29 Exhaustion among the core sample.

Exhausted		
Yes	No	Total
179	151	330

Of the 429 cores evaluated for burning, only 37 or 8.6% exhibited evidence of having been burnt, with the vast majority 392 or 91.4% showing no signs of burning. The low quantity of cores that do show evidence of burning suggests that they were more than likely not intentionally burned or heat treated before knapping. Of the sample of cores (n=284) that were examined for material type, the vast majority, 83.8%, were identified as Lefkara basal (see Table 30). Lefkara translucent is the next most common material type among the cores, represented by just 11.3%. Lesser quantities of translucent, chalcedony, red and green jasper, and Moni were also identified.

Table 30 Material types of core sample.

	n	%
Lefkara Basal	238	83.8
Lefkara Translucent	32	11.3
Translucent	7	2.5
Chalcedony	3	1.1
Moni	3	1.1
Jasper	1	.4
Total	284	100

With the exceptions of fragments, maximum length, width and thickness were recorded for all cores. A total of 346 cores were recorded for these attributes. The mean length of the core assemblage is 56.2mm, with a minimum length of 16.0mm, and a maximum of 113.7mm (see Table 31). The mean width of the core assemblage is 41.6mm, with the minimum width being 12.4mm, and the maximum 98.0mm. The mean thickness of the cores is 27.1mm, with a minimum thickness of 9.8mm and a maximum of 63.6mm.

Table 31 Core type by mean length, width and thickness.

	Length	Width	Thickness
Flake Cores			
Material test Flake	87.3	61.1	34.5
Single platform Flake	72.5	53.1	31.3
Bidirectional Flake	70.0	40.4	25.9
Pyramidal Flake	67.1	45.3	27.4
90 degree Flake	65.3	50.2	33.6
Multidirectional Flake	64.5	46.4	29.9
Opposed platform Flake	63.6	49.4	31.9
Core on flake	60.8	42.4	19.8
Sub-Discoidal	60.6	46.6	27.0
Discoidal Flake	56.8	45.7	22.9
Globular Flake	53.4	42.0	30.2
Tabular	55.6	44.5	21.7
Sub-Pyramidal Flake	50.6	38.2	21.5
Spheroidal	47.0	40.7	31.3
Akrotiri	31.5	26.2	19.6
Blade Cores			
Sub-Naviform	77.2	38.0	28.0
Core on blade	70.8	34.0	22.4
Naviform Blade	70.5	26.0	19.9
90 degree Blade	65.8	52.1	33.6
Single Blade	65.5	44.8	27.7
Opposed Blade	63.2	43.0	24.8
Bladelet Cores			
Bladelet	44.4	32.9	23.5

The presence of naviform and sub-naviform cores, even in very small quantities, at the site is important as their production is a key characteristic of mainland PPNB lithic assemblages. Naviform cores are related to the production of uniform blades. Their presence in Neolithic Cyprus may represent either a fading tradition that lost its value or a copied technology, which was seemingly misunderstood or poorly learned. As there were only three naviform cores and two sub-naviform cores identified among the assemblage, specific attributes for each piece have been provided (see Table 32).

Table 32 Naviform and sub-naviform core attributes.

Core	Length	Width	Thickness	Exhausted	Burnt	Material
Naviform (FN375-6)	73.2	21.8	16.8	yes	No	Lefkara basal
Naviform (FN384-1)	63.2	26.6	16.8	yes	no	Translucent
Naviform (FN408-3)	75.0	29.5	26.2	no	yes	Lefkara basal
Sub-naviform (FN242-2)	83.3	42.2	36.5	no	no	Lefkara basal
Sub-naviform (FN423-4)	71.0	33.8	19.5	no	no	Lefkara basal

5.5 Tools

A total of 2,386 pieces comprise the tools analyzed from *Ais Yiorkis* in this thesis, representing 4.7% of the total assemblage, 7.7% minus debris. The tools were analyzed for a number of qualitative and quantitative attributes, including, class, type, blank, length, width, thickness, platform type, end type, burning, retouch type, and material type. When discussing various attributes, samples are often referred to as attribute analyses and data recording evolved and changed over the years.

Among the *Ais Yiorkis* assemblage the most dominant tools are retouched pieces, which total 1,324 or 55.5% of all tools and include retouched flakes, blades, and tool fragments or retouched pieces of unidentifiable class (see Table 33). Of the retouched pieces, retouched blades are the most dominant class accounting for 29.5% (n=705) of the tools, followed by retouched flakes, which represent 21.5% (n=514) of the tool assemblage. Outside of retouched pieces, scrapers are the primary tool class at 9.9%, followed by notched pieces, at 8.6% of the tools. Backed pieces and backed and truncated pieces occur in lesser quantities, but are more common than other tools types. Backed pieces make up 4.4%, and when combined with backed truncations (0.8%) total 5.2%. Burins (3.4%), truncations (2.9%), and tanged pieces (2.5%) follow in lesser prominence among the tools. Sickles/glossed pieces (2.0%), microliths and varia (1.8% each), Ortos crescents (1.6%), and piercing tools (1.3%) while present, occur in much smaller amounts, with other classes present in quantities totaling 1.0% or less.

Table 33 Tools by class.

	n	%
Retouched Blades	705	29.5
Retouched Flakes	514	21.5
Scrapers	236	9.9
Notches	206	8.6
Tool Fragments	105	4.4
Backed Pieces	104	4.4
Burins	81	3.4
Truncations	69	2.9
Tanged	60	2.5
Sickles/Glossed Pieces	47	2.0
Microliths	44	1.8
Varia	43	1.8
Ortos Crescents	37	1.6
Piercing Tools	31	1.3
Denticulates	25	1.0
Bifaces	23	1.0
Serrated Pieces	20	0.8
Backed/Truncations	18	0.8
Unifaces	6	0.3
Projectile Points	6	0.3
Knives	6	0.3
Total	2,386	100

Examining the tool classes in detail reveals more specific types within each class. Among the 705 retouched blades, the most occurring type is "lateral, partial" at 50.6% (n=357) of all retouched blades, 15.0% of all tools. The designation "lateral, partial" indicates that the retouch on the blade occurs only on one edge and is not continuous. "Bilateral, partial" pieces, with discontinuous retouch on both edges are second among the retouched blades with 20.0% of the class. "Lateral, continuous" blades, with uninterrupted retouch along one edge were found to constitute 14.0% of the retouched blades. Fewer quantities of other retouched blades were also identified (see Table 34).

Table 34 Types of retouched blades.

	n	%
Lateral – partial	357	50.6
Bilateral – partial	141	20.0
Lateral – continuous	99	14.0
Alternate	45	6.4
Bilateral – continuous	43	6.1
Alternating	14	2.0
Lateral – continuous/pointed	6	0.9
Total	705	100

A sample of 697 retouched blades were analyzed for retouch type. The most common retouch types identified were semi-steep at 40.5% and marginal at 40.2%. More invasive retouch types such as abrupt and scalar occur among the retouched blades in far fewer numbers and tend to be discontinuous (see Table 35). Tools with more regular retouch of more invasive types tend to be classed more specifically.

Table 35 Retouch type displayed on retouched blade tools.

	n	%
Semi-steep	282	40.5
Marginal	280	40.2
Steep	100	14.3
Abrupt	15	2.2
Scalar	14	2.0
Invasive	4	0.6
Other	1	0.1
Point tip	1	0.1
Total	697	100

The most commonly occurring type within the retouched flake class (n=514) was also "lateral, partial" at 61.1% (n=314), representing 13.3% of all of the tools (see Table 36). The second most common retouched flake type is "lateral, continuous" with 19.3%. "Bilateral, partial" (14.6%) and "Bilateral, continuous" (5.1%) make up the remainder of the retouched flake tool class. Flakes with retouch affecting one edge (lateral) appear to have been the most desirable and/or functional type.

Table 36 Types of retouched flake tools.

	n	%
Lateral – partial	314	61.1
Lateral – continuous	99	19.3
Bilateral – partial	75	14.6
Bilateral – continuous	26	5.1
Total	514	100

A sample of 509 retouched flakes were analyzed for retouch type, the most common of which was found to be marginal at 38.7%, followed closely by semi-steep at 37.9% (see Table 37). Other retouch types were identified among the flakes, but were represented by much smaller percentages. The number of pieces per retouch type steadily decline the greater the level of invasiveness.

Table 37 Types of retouch exhibited on retouched flakes tools.

	n	%
Marginal	199	38.7
Semi-steep	195	37.9
Steep	77	15.0
Abrupt	18	3.5
Scalar	16	3.1
Invasive	3	0.6
Bifacial	1	0.2
Total	509	100

As discussed above, retouched blade and flake tools are the most commonly occurring/made tool classes for obvious reasons. Blades and flakes are struck from cores as blanks and are then selected for use as tools. Retouched blade and flake classes are largely generic and range from pieces showing light (or marginal) retouch as a result of use (use-wear) to more invasive, intentional and formal retouch types. Although some retouched blades and flakes are obviously more formal tools, as a whole they represent the most simplistic and expedient (i.e., the selection and use of a blade or flake blank as a tool without altering the edge with formal retouch prior to use).

Among both retouched blades and flakes marginal and semi-steep are by far the most prominent retouch types and are the least invasive.

After retouched blades and flakes, scrapers are the most common tool type recovered at *Ais Yiorkis* with 9.9% of the tool assemblage. Of the scrapers, the most common types are side scrapers and end scrapers, each with 44 pieces, representing 18.6% (see Table 38). Side-end scrapers with 15.3% and carinated scrapers with 11.0% are also relatively common. A variety of other scraper types were identified, but these occur with much less frequency.

Table 38 Scrapers by type.

	n	%
End	44	18.6
Side	44	18.6
Side/End	36	15.3
Carinated	26	11.0
Side with interior retouch	23	9.7
Fragment (end or side)	22	9.3
Thumbnail	12	5.1
Micro-end	8	3.4
Circular/oval	6	2.5
Massive end	5	2.1
Double side	4	1.7
End with interior retouch	3	1.3
Massive side	2	.8
Double end	1	.4
Total	236	100

Scrapers are primarily defined by their retouch type, which is characteristically “invasive”. While 97.9% of the scrapers were typed invasive, a few pieces were identified as scrapers, but were noted for the presence of other retouch types as exceptional (see Table 39). Scalar, semi-invasive, abrupt and other retouch types were identified on five of 236 scrapers.

Table 39 Retouch types exhibited on scrapers.

	n	%
Invasive	231	97.9
Scaler	2	0.8
Semi-Invasive	1	0.4
Abrupt	1	0.4
Other	1	0.4
Total	236	100

Within the notched tool class, three types were identified. The vast majority of notched tools (77.2%) were represented by a single notch (see Table 40). Double notched types comprised 18.4%, with double notched on opposing edges representing just 4.4% of the notched tools.

Table 40 Notches by type.

	n	%
Single	159	77.2
Double	38	18.4
Double opposed	9	4.4
Total	206	100

A variety of retouch types are represented among the notched tools, although nearly half, 47.1% were identified as semi-steep (see Table 41). Second in numbers, steep retouch was identified on 34.3% of the notched pieces. Other retouch types are represented in lesser quantities. No notches with marginal retouch were recorded as marginality in the case of potential notched tools is probably unintentional.

Table 41 Retouch types exhibited on notched pieces.

	n	%
Semi-steep	96	47.1
Steep	70	34.3
Abrupt	19	9.3
Marginal	14	6.4
Invasive	3	1.5
Scalar	3	1.5
Total	204	100.0

Tool fragments represent unidentifiable pieces that display retouch. Just two types of tool fragments have been discerned, basic unidentifiable fragments, which make up 99.0%, and a single resharpening fragment (see Table 42).

Table 42 Types of tool fragments.

	n	%
Fragment	104	99.0
Resharpening fragment	1	1.0
Total	105	100

As the tool fragment class represents a variety of other tool classes, only in broken or otherwise unidentifiable form, all retouch types are represented with relatively even distributions of marginal, steep, semi-steep and abrupt types (see Table 43). Invasive and scalar retouch were identified, but in miniscule quantities.

Table 43 Retouch types exhibited on tool fragments.

	n	%
Marginal	29	28.4
Steep	23	22.5
Semi-steep	21	20.6
Abrupt	21	20.6
Invasive	6	5.9
Scalar	2	2.0
Total	102	100.0

The backed tool class is primarily comprised of plain, laterally backed pieces, 41.3% of which were continuous and 41.3% of which were partial or discontinuous (see Table 44). Other types of backed pieces were identified, but in much smaller quantities.

Table 44 Backed pieces by type.

	n	%
Backed – continuous	43	41.3
Backed – partial	43	41.3
Naturally backed	9	8.7
Semi-backed	7	6.7
Double backed and pointed	1	1.0
Bilateral (double)	1	1.0
Total	104	100

The tool class backed/truncated was originally lumped as a varia (multiple) tool type, but as more were identified (n=18) it became clear that backed/truncated tools were intentionally produced and represented their own class of tools. Of the backed/truncated tools, the majority (12 pieces, 66.7%) were laterally backed with a straight truncation on one end (see Table 45). Fewer numbers of other types were also identified, including three pieces (16.7%) that were laterally backed with oblique truncation, two that were laterally backed and truncated at both ends. A single piece was found to be bilaterally or double backed and truncated at one end.

Table 45 Types of backed/truncated tools.

	n	%
Straight	12	66.7
Oblique	3	16.7
Backed with double truncation	2	11.1
Double backed and truncated	1	5.6
Total	18	100

Backed pieces are characteristically defined by the presence of very abrupt, 90 degree retouch. Like backed tools, truncations also often display abrupt retouch. Among the tool assemblage, 100% of the backed and the backed/truncated tools were identified as having abrupt retouch.

The most common burin type identified was single blow, straight with 61.7%, followed by double blow, straight with 12.3% (see Table 46). A number of other burin types were recognized, but occurred in much smaller quantities.

Table 46 Types of burins.

	n	%
Single blow – straight	50	61.7
Double blow – straight	10	12.3
Multiple blow – single face	6	7.4
Single blow – angle	5	6.2
Multiple	4	4.9
Double blow – opposed	2	2.5
Dihedral	2	2.5
Transverse	1	1.2
Double blow – angle	1	1.2
Total	81	100

Burins, unlike all other tool classes, typically are not retouched. Within the *Ais Yiorkis* assemblage, tools classed expressly as burins could not show any evidence that they had been intentionally retouched. Burins that did display retouch were classed among the varia tools, which are discussed below.

Straight and oblique types dominated the truncation tool class, with 46.4% and 42.0% consecutively (see Table 47). Other variations were identified, but in much smaller quantities.

Table 47 Types of truncations.

	n	%
Straight	32	46.4
Oblique	29	42.0
Concave	3	4.3
Convex	2	2.9
Double straight	1	1.4
Double oblique/straight	1	1.4
Double oblique/concave	1	1.4
Total	69	100

As previously mentioned, the majority of truncated pieces display abrupt retouch with 46.3% (see Table 48). Among the truncations steep retouch, which is the next less invasive type follows abrupt with 35.8%.

Table 48 Retouch types exhibited on truncations.

	n	%
Abrupt	31	46.3
Steep	24	35.8
Semi-steep	7	10.4
Invasive	3	4.5
Marginal	2	3.0
Total	67	100.0

A total of 60 tools have been identified as tanged pieces, which may represent projectile points or other hafted tools. Within the tang class, a number of types are represented. The tangs identified within the assemblage are admittedly ambiguous with 45.0% identified as tang fragments, with their true function being unknown (see Table 49). Such fragments may represent the tanged remnants of projectile points, which will be discussed below. Like the tang fragment type, the tang pre-form type at 26.7% may also reveal projectile intentions. "True" or complete tangs comprise only 6.7% of the class, with single shoulder tangs at 10.0%. Tangs identified as "Byblos-like" also make up 10.0%, and may be significant for their similarities to the tangs represented on mainland Byblos projectile points.

Table 49 Types of tanged pieces.

	n	%
Tang – fragment	27	45.0
Tang "pre-form"	16	26.7
Tang – single shoulder	6	10.0
Byblos-like tang	6	10.0
Tanged	4	6.7
Double tang	1	1.7
Total	60	100

The majority of the tangs display invasive or abrupt retouch at 36.2% and 27.6% consecutively (see Table 50). Steep retouch (13.8%), bifacial retouch (10.3%), and semi-steep retouch (8.6%) also occur in no table numbers.

Table 50 Retouch types exhibited on tanged pieces.

	n	%
Invasive	21	36.2
Abrupt	16	27.6
Steep	8	13.8
Bifacial	6	10.3
Semi-steep	5	8.6
Other	1	1.7
Scalar	1	1.7
Total	58	100.0

Microliths actually span a number of the other tool classes, such as retouched and backed pieces, but are based on blank type, which are bladelets. Laterally (single edge) retouched bladelets are the most common microlith type with 59.1%, followed by backed bladelets and bilaterally retouched bladelets with 11.4% each (see Table 51). Other types of microlithic tools were identified, including two glossed pieces as well as a lunate.

Table 51 Microliths by type.

	n	%
Retouched bladelet – lateral	26	59.1
Backed bladelet – lateral	5	11.4
Retouched bladelet – bilateral	5	11.4
Notch	2	4.5
Gloss and retouch - same side	2	4.5
Lunate	1	2.3
Micro-burin	1	2.3
Truncation – concave	1	2.3
Truncation – oblique	1	2.3
Total	44	100

Among the microliths marginal retouch was found to be the majority with 48.8% (see Table 52). Semi-steep is the second most common retouch type with 23.3%, followed by abrupt with 20.9%.

Table 52 Retouch types exhibited on microliths.

	n	%
Marginal	21	48.8
Semi-steep	10	23.3
Abrupt	9	20.9
Steep	3	7.0
Total	43	100.0

While the sickles/glossed tools total only 47 pieces, their presence at *Ais Yiorkis* is notable. Such tools indicate the processing of plant materials in general and grains in particular (Curwen 1930, Anderson 1980, Unger-Hamilton 1984). The primary type within this tool class is laterally glossed pieces with 31.9%, followed by laterally glossed pieces with retouch on the same edge with 23.4% (see Table 53). Other variations of gloss and retouch also occur, including a single piece with gloss and retouch opposite a crescent.

Table 53 Sickles/glossed pieces by type.

	n	%
Gloss – lateral	15	31.9
Gloss and retouch – same side	11	23.4
Gloss/serrated – lateral	8	17.0
Gloss and Backed – opposite ends	7	14.9
Gloss and retouch – opposite sides	3	6.4
Gloss – bilateral	1	2.1
Gloss/serrated – bilateral	1	2.1
Gloss and retouch/opposite crescent	1	2.1
Total	47	100

A total of 37 tools were identified as Ortos crescents among the *Ais Yiorkis* assemblage. Named for their first identification at the site of Kholetria *Ortos*, these crescents are distinctive for their shape and size. Most of the Ortos crescents are end only types with 51.4%, or end and side, 40.5% (see Table 54). Only 8.1% were identified as lunates. Any crescents displaying gloss are defined as sickles/glossed pieces, which are discussed above (see Table 53).

Table 54 Types of Ortos crescents.

	n	%
End only	19	51.4
End/side	15	40.5
Lunate	3	8.1
Total	37	100

The vast majority of Ortos crescents display abrupt retouch (73.0%) creating the crescent shape (see Table 55). Other retouch types were recognized in far fewer numbers.

Table 55 Retouch types exhibited on Ortos crescents.

	n	%
Abrupt	27	73.0
Steep	6	16.2
Invasive	3	8.1
Semi-steep	1	2.7
Total	37	100

A variety of types of piercing tools were identified. Perforators (percoir, flake borers) were the majority with 48.4% (see Table 56). Fragments of piercing tools were second in numbers with 16.1%, followed by blade borers with 12.9%. Numerous types of drills were among the other piercing tools identified, but occurred in very small quantities.

Table 56 Piercing tools by type.

	n	%
Perforator/percoir/flake borer	15	48.4
Fragment	5	16.1
Blade borer	4	12.9
Micro-drill (bladelet)	2	6.5
Drill tip	2	6.5
Tang blade drill – angled	1	3.2
Massive perforator/awl	1	3.2
Drill – long bit	1	3.2
Total	31	100

Half of the piercing tools displayed semi-steep retouch (see Table 57). Steep retouch was identified on 20.0%, and lesser quantities of other types were also recorded.

Table 57 Retouch types exhibited on piercing tools.

	n	%
Semi-steep	15	50.0
Steep	6	20.0
Invasive	4	13.3
Abrupt	3	10.0
Marginal	1	3.3
Other	1	3.3
Total	30	100.0

Bifaces number just 23, with single edge tools representing the majority of the types at 39.1% (see Table 58). Preformed bifaces follow with 26.1%, and lesser quantities of other types are also present.

Table 58 Types of biface tools.

	n	%
Single edge	9	39.1
Preform	6	26.1
Complete – entire surface	3	13.0
Fragment	3	13.0
Two edges	2	8.7
Total	23	100

Bifacial retouch dominated the biface tools, making up 60.9% (see Table 59). The second most common was invasive retouch with 30.4%. Lesser percentages semi-steep and full invasive retouch types follow.

Table 59 Retouch types exhibited on biface tools.

	n	%
Bifacial	14	60.9
Invasive	7	30.4
Semi-steep	1	4.3
Full invasive	1	4.3
Total	23	100

Within the denticulate tool class only two types were recognized. A total of 92.0% were lateral denticulates, while 8.0% (2 pieces) were bilateral (see Table 60).

Table 60 Denticulates by type.

	n	%
Denticulate	23	92.0
Bilateral	2	8.0
Total	25	100

Half of the denticulates were found to display semi-steep retouch (see Table 61). The next most common retouch type is steep with 37.5%. Abrupt (8.3%) and "other" (4.2%) retouch types are also represented among the denticulates, but in fewer numbers.

Table 61 Retouch exhibited on denticulates.

	n	%
Semi-steep	12	50.0
Steep	9	37.5
Abrupt	2	8.3
Other	1	4.2
Total	24	100

A total of 24 tools were identified as pieces escallier. Pieces escallier are a very distinct tool class which are primarily characterized by the presence of scalar retouch. Scalar retouch largely represents battering.

The vast majority of serrated pieces were identified as lateral (85.0%). Bilateral pieces are second in number with just 15.0% (see Table 62).

Table 62 Serrated pieces by type.

	n	%
Lateral	17	85.0
Bilateral	3	15.0
Total	20	100

Steep retouch was recorded for half of the serrated pieces (see Table 63). Lesser numbers of other retouch types were also recorded among the serrated tools.

Table 63 Retouch type exhibited on serrated pieces.

	n	%
Steep	10	50.0
Other	4	20.0
Semi-steep	3	15.0
Marginal	3	15.0
Total	20	100

The varia or multiple tool class was developed in order to envelope those tools that display characteristics of two or more tool classes, and other odd tool types (see Table 64). Retouch types cannot be compared within the varia assemblage as they are largely not comparable tools.

Table 64 Varia tools by types.

	n	%
Wedge/core tablet	4	21.1
Burin/scraper	3	15.8
Side scraper/notch	2	10.5
Backed straight truncation with opposite gloss	2	10.5
Burin on truncation	1	5.3
Burin/perforator	1	5.3
Notch on truncation	1	5.3
Notch/opposite backing	1	5.3
Multiple notch/perforator	1	5.3
Carinated end scraper/ denticulate	1	5.3
Retouched piece on core	1	5.3
Waisted/strangulated	1	5.3
Total	19	100

The presence of and/or need for projectile points in Aceramic Neolithic Cyprus has long been moot as they have only been found in very small quantities at some sites and "no longer formed an element of the Cypriot toolkit," and animal management or "controlled exploitation" is the preferred interpretation related to hunting methods (Steel

2004: 56, Croft 1991, Davis 1989). Among the 51,240 pieces of chipped stone, 2,386 tools processed from *Ais Yiorkis*, a total of just six projectile points were solidly identified (see Table 65). Of the crude projectile points, three were identified as Byblos-like, one of which exhibits an angled tang, two do not fit neatly into any known type therefore has been typed as projectile point "other," and one has been typed as a notched fragment.

Table 65 Projectile points by type.

	n	%
Byblos, other	2	33.3
Other	2	33.3
Byblos – angled tang	1	16.7
Notched fragment	1	16.7
Total	6	100

The breakdown of the retouch types identified on the projectile points has limited significance, as six points are split between four types, which can be seen in Table 66 below.

Table 66 Retouch types exhibited on projectile points.

	n	%
Semi-steep	2	33.3
Abrupt	2	33.3
Steep	1	16.7
Full invasive	1	16.7
Total	6	100

Just six tools were identified within the uniface tools class. Of the six, five or 83.3% were fragments and just one was found to be complete (see Table 67). The retouch exhibited on all six of the uniface tools was identified as invasive.

Table 67 Types of uniface tools.

	n	%
Fragment	5	83.3
Complete	1	16.7
Total	6	100

A total of six knives were also identified, including three unifacial, lateral, and one unifacial, bilateral, one bifacial, bilateral pieces and one fragment. In terms of retouch types among the knives, there is considerable variation, with abrupt, invasive, scalar, other, and bifacial types exhibited (see Tables 68 and 69).

Table 68 Types of knives.

	n	%
Unifacial – lateral	3	50.0
Unifacial – bilateral	1	16.7
Bifacial – bilateral	1	16.7
Fragment	1	16.7
Total	6	100

Table 69 Types of retouch exhibited on knives.

	n	%
Abrupt	2	33.3
Invasive	1	16.7
Scalar	1	16.7
Bifacial	1	16.7
Other	1	16.7
Total	6	100

Among the tools, 892 or 37.4% were found to be complete pieces, while 1,495 or 62.6% were broken. Of the sample of 2,346 tools examined for burning only 15.6% showed evidence of heat exposure. In comparing burning to tool class, the distribution does not appear to be significantly different than that of the general assemblage, although a higher percentage of pieces classed as tool fragments were identified as burnt (7.4%) than exist in the greater tool assemblage (4.4%). Of the burnt tools, 74.5% were broken. The status of the tool fragment class as broken and/or unidentifiable pieces may explain their comparatively higher percentages of burning or the burning may explain their status as broken.

Of the sample of tools recorded for material type (n=1,209), 1,075 or 88.9% were identified as Lefkara basal, 75 or 6.2% were Lefkara Translucent, 46 or 3.8% were Translucent, 8 or 0.7% were Obsidian, 3 or 0.2% were Moni, 2 or 0.2% were jasper, and there were no tools made from chalcedony. The high incidence of Lefkara basal among the tools is to be expected based on its local availability and high quality as a raw material. The low percentage of Moni among the tools is also to be expected as no immediate source has been located in the area. As there are only 16 pieces of obsidian among the chipped stone assemblage from the seasons examined here it is notable that eight of those or 50.0% exhibit retouch and have been classed as tools.

5.6 The Assemblage in Context

Thus far the chipped stone assemblage from *Ais Yiorkis* has been discussed in detail as individual classes, types and pieces. While this general discussion is important and useful for future comparative and other analyses, it is equally as important to characterize the assemblage as a whole. In the following chapter various aspects of the data discussed above will be used to answer specific questions looking at the relationship between the chipped stone assemblage and the Cypro-PPNB, *Ais Yiorkis*, and the economic activities pursued by its inhabitants. Avenues of inquiry include an examination of raw materials, reduction and tool production and use.

CHAPTER 6

RESEARCH QUESTIONS, RESULTS & INTERPRETATIONS

6.1 Introduction

The nature of the chipped stone assemblage from *Ais Yiorkis* facilitates the asking and answering of a variety of general as well as very specific research questions related to the site, and the activities and lifestyle of its inhabitants. Internal artifact variation will be examined to determine if the types of artifacts present reveal specific patterns. Contextual data related to the units and levels from which chipped stone artifacts were recovered will then be compared to determine whether or not distribution can inform more specific interpretations related to site function, economic or other activities occurring at *Ais Yiorkis*. An inter-site comparison between the *Ais Yiorkis* chipped stone assemblage and that recovered from Kalavasos *Tenta* will allow a clearer perspective of the chronological placement of the site and artifact variation via the chipped stone. The material from *Tenta* is particularly useful in comparison as there are multiple assemblages representing the various periods of the site's occupation, and the methods of analysis and terminology are similar to those used in this study (McCartney and Todd 2005). Finally, it will be determined where the chipped stone assemblage from *Ais Yiorkis* fits contextually within the Cypriot Aceramic Neolithic independent of radiocarbon dates.

6.2 Internal artifact variation

The research questions under investigation here relate to internal artifact variation and provide interpretation. Specifically this query asks: what does the chipped stone recovered from *Ais Yiorkis* say about the site's inhabitants, their economy, and their use of the site? Looking at variation in terms of the classes and types of chipped stone recovered from *Ais Yiorkis* reveals a great deal about the economic activities of the inhabitants. More specific questions focusing on particular aspects of the assemblage will be discussed in turn and have acted to inform the interpretations presented in this thesis. In order to address these questions related to chipped stone production and reduction, raw materials and *chaînes opératoire* related to size and reduction stage must first be examined.

6.2.1 Economic Choice and Behavior

What can an examination of the various aspects of the assemblage tell about economy and site use when looked at independently?

6.2.1.1 Raw Material

In general, the raw materials found in archaeological contexts represent two things, availability and desirability. Some raw materials are readily available and are therefore found to be present in large quantities. It is important to note that the most available raw material is not always of the highest quality. The highest quality materials are generally more desirable and are often not as readily available, so are, therefore, generally found in lesser quantities and tend to be used for more important or specific purposes (e.g., as tools). Good quality or second choice materials that are more available are often the most employed.

What does the raw material selection reveal about the chipped stone economy at *Ais Yiorkis*? While other variables likely were important, it seems that the people inhabiting *Ais Yiorkis* also chose their location carefully so as to have a readily available, relatively high quality raw material at close range. Overall, the use and selection of raw materials by the people of *Ais Yiorkis* is relatively straightforward.

Lefkara basal represents the most utilized material in every category, averaging 80.4% of the assemblage sample. More tools (88.9%) were made from Lefkara basal than were cores, flakes, bladelets or blades. Blades had the lowest percentage of Lefkara Basal with 73.4%. Lefkara basal is known to have a source within just a few miles of the site and offers a very good raw material for all knapping purposes (Stewart 2006). Lefkara translucent averaged 11.9% of the assemblage material type sample with blades averaging the highest percentage (15.7%) and tools the lowest (6.2%). Translucent constitutes just 6.7% of the assemblage sample. While Translucent is a very high quality material, it is not local, therefore would have required more time and effort to acquire and was therefore not used nearly as often. Notably, Translucent was used in comparatively high percentages in the production of blades (10.2%) and bladelets (10.9%), compared to just 3.8% of the tools and 2.5% of the cores. At 0.4% Moni, a non-local material, was not brought in or used in any selective way, indicating that it was probably not seen as particularly important or special. Just 0.3% of the chipped stone sample was identified as chalcedony, but the quality of this material is generally poor. Obsidian, as an imported material originating in Anatolia, is obviously one of the least occurring raw material types at 0.3%. Of the 15 comparable pieces recovered (minus 1 chip), eight have been identified as tools, with five bladelets and two blades. A conscious decision and/or the general realization that this material, given its high quality and perpetual sharpness was naturally designed to function as a tool facilitated its import and use. Jasper comprises just 0.2% of the material type sample, with half (3) of the pieces identified as cores. This is an interesting phenomenon as the presence of cores of any material would appear to indicate reduction with intention of use, but it seems rather that jasper had been tested, albeit to a greater degree than typical material tests, and then discarded (see Tables 70 and 71).

Table 70 Raw material type percentages for cores, flakes, blades, bladelets and tools.

Material Type	Cores	Flakes	Blades	Bladelets	Tools
Lefkara Basal	83.8	79.6	73.3	74.1	88.9
Lefkara Translucent	11.3	13.3	15.6	13.8	6.2
Translucent	2.5	6.2	10.2	10.9	3.8
Moni	0.4	0.2	0.4	0.7	0.2
Chalcedony	1.1	0.4	0.2	0.0	0.0
Obsidian	0.0	0.0	0.4	0.2	0.7
Jasper	1.1	0.0	0.0	0.0	0.2
Total	100	100	100	100	100

Table 71 Raw material type counts for cores, flakes, blades, bladelets and tools.

Material Type	Cores	Flakes	Blades	Bladelets	Tools	Total	%
Lefkara Basal	238	1,879	417	640	1,075	4,249	80.4
Lefkara Translucent	32	313	89	119	75	628	11.9
Translucent	7	147	58	94	46	352	6.7
Moni	1	7	2	6	3	19	0.4
Chalcedony	3	14	1	0	0	18	0.3
Obsidian	0	0	2	5	8	15	0.3
Jasper	3	1	0	0	2	6	0.1
Total	284	2,361	569	864	1,209	5,287	100

6.2.1.2 Cores and Core Reduction

While the core assemblage recovered from the site thus far numbers only 449, the cores themselves are quite informative. The types of cores identified, while representing the last episode of reduction for that core, reveal a snapshot of reduction trends especially among non-exhausted cores. While the core types are telling, relying too much on core type for interpreting reduction trends can provide a limited and distorted picture.

What does the core population from *Ais Yiorkis* tell us about the chipped stone economy? As previously discussed, the number of cores displaying flake scars outnumber all other core types. Flake cores constitute the majority at 75.3% of the cores (338), indicating at least that late stage core reduction was producing primarily flakes. This number does not correspond to the debitage and tool rates of flake and blade blank production discussed below. The differences evident between core types based on reduction scars and debitage and tool blanks solidifies the late reduction bias based on size. The average of the (265, minus material tests) flake cores being 54.9mm in length, 41.8mm in width, and 27.4mm in thickness, compared to blade cores which average 65.9mm in length, 43.3mm in width, and 26.9mm in thickness and bladelet cores averaging 44.4mm in length, 32.9mm in width, and 23.5mm in thickness shows an obvious size differential based on intended product. Blade cores are the largest in size overall. When compared directly to flake cores as in Figures 4 and 5, blade cores are not only slightly larger, but also fall within a tighter interior and exterior range in terms of both length and thickness, with fewer outliers overall among the blade cores. The bladelet cores are overall much smaller than either the blade or flake cores. When the boxplot for bladelet cores is compared to those for blade and flake cores, it can be noted that bladelet cores have the smallest range in size (See Figures 4, 5 and 6).

Figure 4 Boxplot showing the range of size among the blade cores.

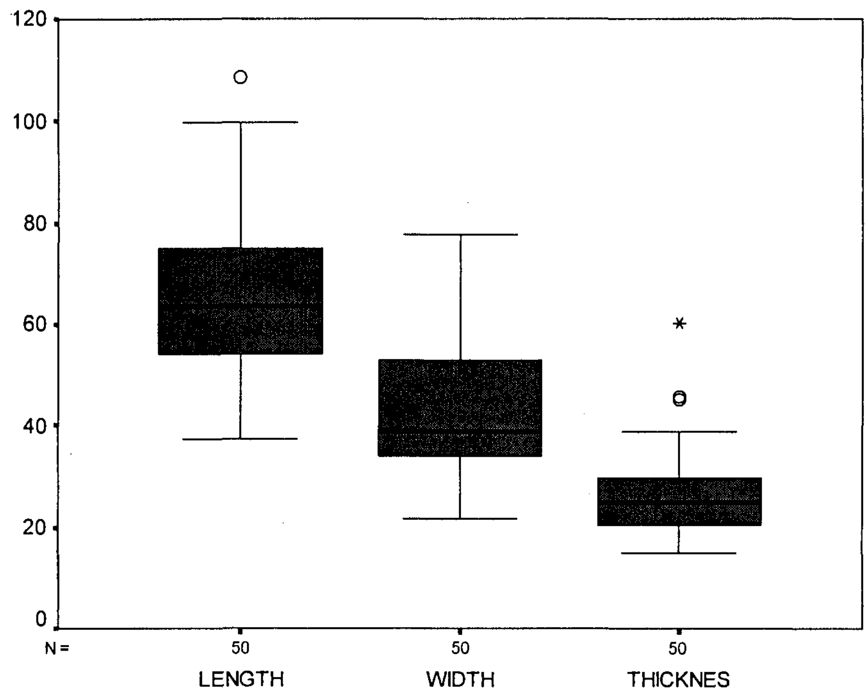


Figure 5 Boxplot showing the range of size among the flake cores.

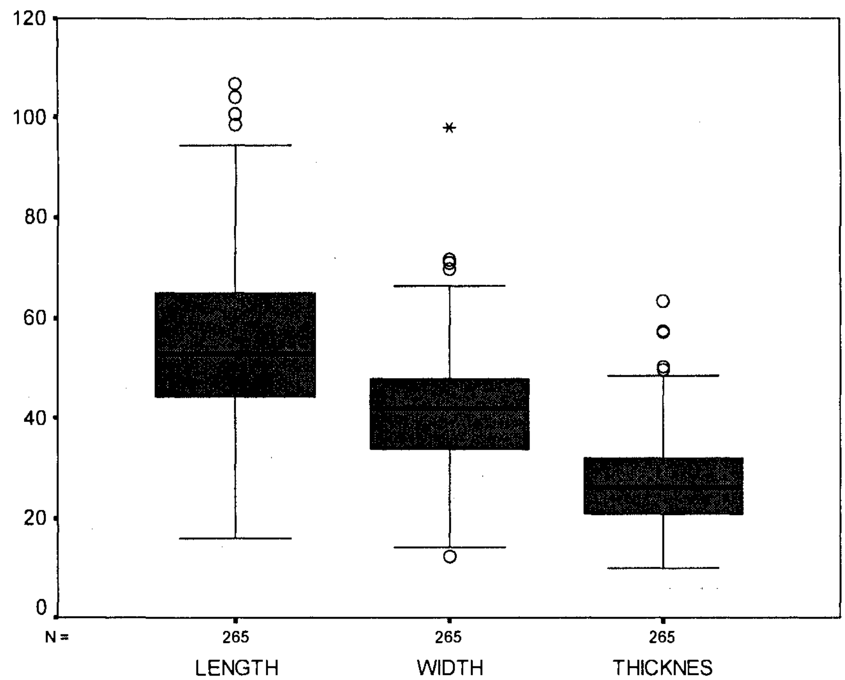
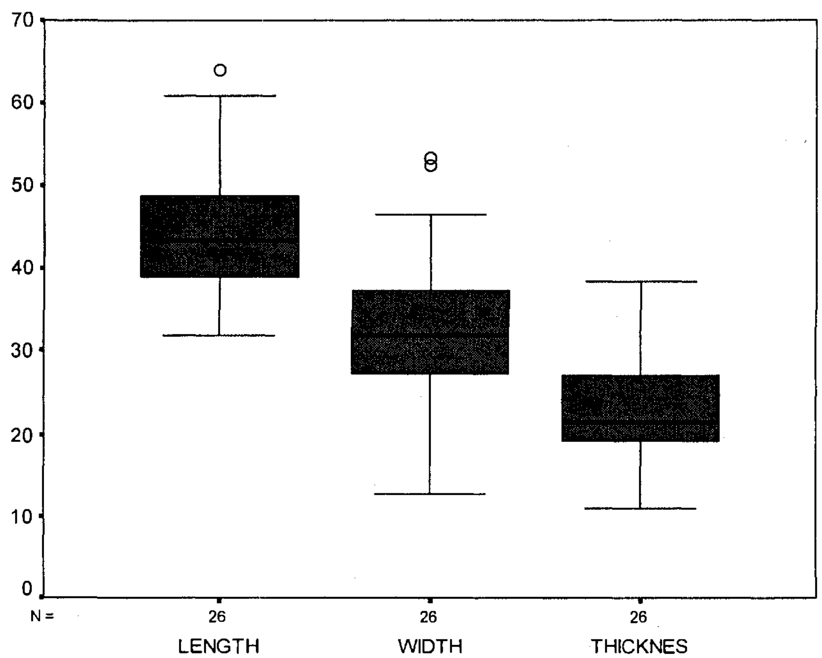


Figure 6 Boxplot showing the range of size among the bladelet cores.



Also important to note, related to the blade core population is the incidence of naviform and sub-naviform cores. As previously mentioned, the presence of these core types is indicative of at least an attempt (albeit minor) to emulate or at the very least remember the dominant blade production technique employed on the mainland. Blade production in general is a Neolithic phenomenon. More specific to Cyprus, finer blades have been documented in the Cypro-PPNB devolving to thicker and less-fine blades in the later KC.

6.2.1.3 Blank Production

In terms of blank types, both debitage and tools are important. While debitage blanks reflect trends in core reduction practices and seemingly the desired end products of core reduction, the blank types of tools represent very specifically those blanks that were actually chosen for the production of tools. Obviously tool blank types may not reflect the original intent or product of the knapper as breakage occurs and tools are recycled or retooled, potentially changing the identifiable blank type. While recycled tools may seem to present a problem in blank identification, it can be said that if there were a blank type distortion among tools it would favor flakes.

What does an examination of blank production and blank types reveal about the chipped stone economy? The sample of debitage and tools that were analyzed for blank type revealed that within the *Ais Yiorkis* chipped stone assemblage, blades were the most desirable blank type. Blades represent the majority at 49.6% of the tool blanks compared to flakes at 43.5%, but only 20.9% of the debitage after 60.2% of flake blanks. Either more flakes were produced, but blades were more often selected for tools, or more blade blanks were selected for the purpose of tool production, inflating the flake blanks among the debitage.

When the absolute numbers of blank types are combined between tool blanks and debitage blanks, it is revealed that flakes were produced more often than any other blank type, with 58.9%. Of the combined blank types, blades are second, but with just 23.1% (See Tables 11, 72 and 73). This would indicate that a preference and selection of blade blanks in tool production occurring after reduction rather than during holds truer. Interpreting the reasoning behind this trend is difficult as the reality of core reduction opposed to tool production may reflect the overall skill of knappers in general (i.e., flakes are easier to produce than blades), differential specialists (i.e., the people reducing the cores and providing the blanks may not be the people making and/or using the tools), or the previously mentioned idea of limited technological memory and a preference for blade tools related to a mainland past and an (almost) lost technology of blade production, blade tool use, and projectile point manufacture via naviform cores.

Table 72 Blank types of tools and debitage combined.

	N	%
Flakes	17,907	58.9
Blades	7,034	23.1
Bladelet	1,695	5.6
Indeterminate	64	0.2
Core trimming element	142	.5
Microflakes	3,382	11.1
Core	15	0.1
Core tablet	31	0.1
Burin spall	152	.5
Total	30,422	100

Table 73 Blank types among tools.

	N	%
Blades	1,183	49.6
Flakes	1,039	43.5
Indeterminate	64	2.7
Bladelet	52	2.2
Core trimming element	20	0.8
Core	15	0.6
Core tablet	6	0.3
Burin spall	7	0.3
Total	2,386	100

When compared to the cores, the debitage and tool rates of blank production also do not correlate (See Tables 27, 72 and 73). With 75.3% flake cores compared to 58.9% flake blanks among debitage and tools combined, there is a demonstrated bias reflected in the life cycle of cores. It is safe to assume that a percentage of these flake cores were once used in the production of blade blanks. Among the debitage, bladelet blanks make up 5.9%, ranking fourth after flakes, blades and microflakes. Among the tools, bladelets are classed as microliths. Microlithic tools were defined during analyses by their blank type, dictated by their small size (i.e., less than 12mm in width). Microliths constitute just 1.8% (n=44) of the tool assemblage, which is comparatively lower than the number of blanks produced and available. As microliths are generally not characteristic of Neolithic assemblages in general, their presence, while not shocking can be considered significant.

A key question related to the primary identification of these tools, which actually span other defined classes, into one class in which types are associated based only on size, relates to whether or not this is a valid mode of categorization. Is the production of such tools based on intent and/or the desire to produce or use tools of such size? Well over half of the microliths are retouched bladelets, although other types are present, including backed pieces, glossed pieces, and truncations. While there is a small range of tool types within the class, they greatly vary from one another in terms of function. Again, bladelet cores constitute 6.9% of the assemblage, which while higher than the percentage of bladelet blanks among the tools, closely resembles the bladelet blanks within the debitage sample. Although the bladelet cores have been established as among the smallest cores, and their size could simply reflect that their utilization in the production of "small blades" in the final stages of their use-life, 75.0% were considered to be viable, not exhausted cores. The types of microliths, presence of bladelet blanks among the debitage, incidence of bladelet cores and their lack of exhaustion suggest that bladelets were intentionally produced and then selected for the production of microlithic tools of a small range of types (i.e., small cutting tools) based on their size.

6.2.1.4 Blanks and Cortex

One aspect generally associated with the larger *chaînes opératoire*, the amount of cortex present, can reveal more than just information related to reduction. Differential preferences in terms of blank type and cortex can be seen when the presence of cortex on blades and flakes is examined between debitage and tools.

What does the presence of cortex on debitage and tool blanks reveal about the chipped stone economy at *Ais Yiorkis*? As outlined in Chapter 5, primary flakes and blades with over 50% cortical material constitute 1.9% of the debitage, secondary (between 1 and 49% cortex) make up 14.9% and tertiary blades and flakes (exhibiting no cortex) total 83.2%. Of the blade and flake tools, 25 or 1.1% (of 2,219) represent primary blank types. Secondary levels of cortex are exhibited on 389 or 17.5% of the flake and blade blanks among the tools. The greatest amount with 1,809 pieces or 81.5% are tertiary. As tertiary debitage is ultimately considered the most desirable end product for use in tool production and the most prevalent byproduct of core reduction these numbers are to be expected, and clearly show a bias for both the production and use of tertiary blank types in tool production. The minor decrease in the presence of primary blanks from 1.9% in debitage to 1.1% in tools and tertiary from 83.2% in debitage to 81.5% in tools is notable with the increase of secondary blanks used as tools, from 14.9% of debitage to 17.5% of tools.

When retouched pieces are discounted it can be said that most, if not all of the primary/cortical flake and blade tool classes were those that would benefit from the natural backing that can be provided by cortical material. These tool classes include scrapers, notches, backed pieces and an Ortos crescent. In taking a closer look at secondary blade and flake tools combined, the distribution by tool class is much broader, and outside of the general trends of the entire assemblage towards high percentages of retouched pieces, scrapers and notches, no tool class stands out as having particularly benefited by the presence of secondary cortex. While the slight increase in secondary blanks among tools stands out, it does not constitute an extraordinary difference and does not have a quantifiable or obvious explanation.

The majority of blade tools are simply retouched blades, and this is true of tertiary, secondary, and primary blades. When retouched blades (57.9%) are discounted, the majority of the tertiary blade tools are notched pieces which comprise 17.1% of the restricted total, followed by backed pieces with 13.3%, burins with 11.5 %, tanged pieces with 11.2%, and scrapers with 11.0%. When a restricted analysis is presented for secondary blades (minus retouched blades at 58.2%), the most frequently occurring tool type for this blank are burins which constitute 20.6% followed by scrapers and notches with 14.7% each and backed pieces with 10.3%. Of the six primary blades, retouched blades are half, with the remaining three tools split with a burin, a notched and a backed piece. Based on this analysis, it can be said that despite the level of cortex, blade blanks were used for a particular range of tool classes that include the more obvious retouched blades, backed pieces and burins, but also less expected tool types such as notches and scrapers (see Table 74). An examination of the blank types related to class and type also revealed that particular blank types were not chosen for the production of a specific tool type within any given class.

Table 74 Blade blank types by tool class.

	Blank			
Class	Cortical Blade	Secondary Blade	Tertiary Blade	Total
Projectile points	0	0	6	6
Piercing tools	0	2	8	10
Scrapers	0	10	47	57
Burins	1	14	49	64
Notches	1	10	73	84
Denticulates	0	2	3	5
Serrated pieces	0	4	11	15
Knives	0	0	5	5
Sickles/glossed pieces	0	2	38	40
Truncations	0	3	29	32
Tanged	0	4	48	52
Backed	1	7	57	65
Retouched blades	3	95	587	685
Varia	0	4	14	18
Tool fragment	0	0	2	2
Biface	0	1	5	6
Uniface	0	2	1	3
Crescent	0	3	20	23
Backed/truncation	0	0	11	11
Total	6	163	1014	1183
Restricted Total	3	68	427	498

Like blade tools, the majority of flake tools are retouched flakes with 49.3%, dominating both the tertiary and secondary flake tool classes, with 48.9% of tertiary and 52.2% of secondary blank types. When the retouched flakes are removed from the tool classes, scrapers are the most dominant tertiary flake tool with 30.8%, followed by notched tools with 21.2%. Considering the restricted analysis omitting retouched flakes, scrapers also make up the majority of the secondary flake tools, with 38.9%, again followed by notched tools with 26.9%. The primary flake tools differ from tertiary and secondary in that scrapers are the most common tool class even without restricting the analysis to exclude retouched flakes. When retouched flakes are included, scrapers constitute 36.8% and 53.8% when retouched flakes are omitted. This trend may suggest that blanks with higher amounts of cortex (over 50%) were exploited for their more significant natural protective properties (as opposed to natural backing confined to the edge) that may improve the act of scraping. Like blade blanks, flake blanks appear to have been used in the production of a particular tool set made up primarily of scrapers and notches (See Table 75). While particular tool classes were noted, flake tools were not distributed in any specific manner by blank across tool class by type.

Table 75 Flake blank types by tool class.

	Blank			
Class	Primary Flake	Secondary flake	Tertiary Flake	Total
Piercing tools	0	2	11	13
Scrapers	7	42	125	174
Burins	0	4	9	13
Notches	3	29	86	118
Denticulates	0	7	13	20
Serrated pieces	0	1	4	5
Knives	0	0	1	1
Sickles/glossed pieces	0	0	5	5
Truncations	0	6	31	37
Tanged	0	0	5	5
Backed	1	6	29	36
Retouched flakes	6	118	388	512
Varia	0	6	12	18
Tool fragment	0	2	47	49
Biface	1	0	8	9
Uniface	0	0	3	3
Crescent	1	1	12	14
Backed/truncation	0	2	5	7
Total	19	226	794	1,039
Restricted Total	13	108	406	527

6.2.1.5 Platform and End Types

What can platform and end types on debitage and tool blanks reveal about the chipped stone economy at *Ais Yiorkis*? Examining the platform and end types between blade and flake tools and blade and flake debitage informs the interpretation of blank selection for tool production. The platform types identified on blades among both the tool population and the debitage showed single platforms to be the most common with 45.2% of blade tools and 46.6% of blade debitage. The next most common platform type is crushed, which is displayed on 29.5% of blade tools and 22.4% of blade debitage, and is again rather consistent. Other platform types occur in similar numbers between blade tools and blade debitage, with no notable differences (See Table 76). It appears that platform type was not considered an important factor in the selection of blanks for tool production.

Table 76 Comparing platform types between blade tools and blade debitage.

	Blade Tools		Blade Debitage	
Platform Type	N	%	n	%
Single	285	45.2	396	46.6
Crushed	186	29.5	190	22.4
Dihedral	44	7.0	83	9.8
Punctiform	37	5.9	62	7.3
Multiple	37	5.9	46	5.4
Unidentifiable	26	4.2	36	4.2
Cortical	15	2.4	37	4.4
Total	630	100	850	100

When end types were compared between blade tools and blade debitage differences were more obvious. Among blade tools, blunt ends were the most common end type exhibited with 61.3% compared to 43.6% of blade debitage. The second most common end type was hinged with 19.4% of blade tool ends and 26.5% of blade debitage. Pointed and overshot ends occurred in relatively comparable percentages. Impact fragments were noted in just 0.8% of the blade tools and identify only the ends of tools that exhibit breakage related to projectile points. The lower incidence of feathered ends and the high quantity of blunt ends among the blade tools can be attributed to the presence of retouch which can have the affect of blunting the ends of tools (See Table 77). While differences are seen between the end types of blade tools and blade debitage they are not considered to be due to intentional selection of blanks with particular end types.

Table 77 Comparing end types between blade tools and blade debitage.

	Blade Tools		Blade Debitage	
End Type	n	%	n	%
Blunt	402	61.3	365	43.5
Hinged	127	19.4	222	26.4
Pointed	80	12.2	129	15.4
Overshot	27	4.1	37	4.4
Feathered	15	2.3	87	10.4
Impact fracture	5	0.8	0	0.0
Total	656	100	840	100

The platforms identified on flake blanks can be compared as blades were in order to determine if patterns differ between the production of flake blanks and the selection of blanks for tools. The most common platform type among the flake tools is single with 44.0% which is comparable to the flake debitage at 46.0%. Crushed platforms follow with 30.1% of flake tools, but only 20.4% of flake debitage. This may indicate that platforms may have been crushed during tool production and may not truly represent platforms crushed during core reduction. Dihedral platforms are the third most common type among both flake tools and debitage, although the percentage of dihedral platforms among the flake debitage is double the percentage of flake tools (see Table 78).

Table 78 Comparing platform types between flake tools and flake debitage.

	Flake Tools		Flake Debitage	
Platform Type	n	%	n	%
Single	276	44.0	1,567	46.0
Crushed	189	30.1	695	20.4
Dihedral	46	7.3	519	15.2
Multiple	40	6.4	246	7.2
Cortical	34	5.4	170	5.0
Unidentifiable	34	5.4	75	2.2
Punctiform	8	1.3	136	4.0
Total	627	100	3,408	100

When the end types are examined between flake tools and flake debitage more prominent differences are seen. Blunt ends are the most common among the flake tools with 69.0%; whereas blunt ends only comprise 33.8% of flake debitage end types (see

Table 79). Hinged ends are the most prominent end among the flake debitage with 40.6%, compared to 21.0% of the flake tools. Percentages of overshot and to a lesser extent pointed ends are generally comparable between flake tools and flake debitage. A significant difference between the flake tools and flake debitage in terms of percentages of feathered ends exists, with flake tools at 1.3% and flake debitage at 17.3%. As discussed above in relation to the blade tools, the low incidence of feathered ends among the flake tools is probably more representative of the effects of retouching for tool production than of any intentional selection, especially given that feathered ends are said to be among the most desirable end types (Whittaker 1994).

Table 79 Comparing end types between flake tools and flake debitage.

	Flake Tools		Flake Debitage	
End Type	n	%	n	%
Blunt	530	69.0	1,153	33.8
Hinged	161	21.0	1,382	40.6
Overshot	34	4.4	211	6.2
Pointed	33	4.3	65	1.9
Feathered	10	1.3	589	17.3
Total	768	100	3,408	100

6.2.1.6 Burning or Heat Treatment

What can evidence for the presence or absence of burning reveal about the chipped stone economy? Overall, the vast majority of the assemblage showed no signs of burning or intentional heat treatment (see Table 80). The percentages of burnt to not burnt are notable between cores, debitage and tools. Cores exhibited the least amount of burning, only 8.6%, with slightly higher rates among the debitage at 10.6%, and tools having the greatest evidence if burning at 15.5%. The differential range between cores and tools may suggest that some tools may have been intentionally heat treated, although still in comparatively low quantities. Although debris was not analyzed for burning, during preliminary analysis there appeared to be higher quantities of burnt pieces among the chips and chunks than any other population. It should be noted that the broken and fragmentary nature of some debris may have been caused by burning.

Table 80 Incidence of burning among the chipped stone assemblage.

	Tools	Cores	Debitage
Burnt	15.5	8.6	10.6
Not Burnt	84.5	91.4	89.3
Total	100	100	100
n=	2,344	429	5,565

6.2.1.7 Blanks and Size

What do the quantitative measurements, length, width and thickness of blade blanks reveal about the chipped stone economy? The average lengths, widths and thicknesses of the complete primary, secondary and tertiary blade tool samples do not differ dramatically, indicating relative consistency despite the presence of cortex and the minimal number of cortical and secondary pieces being used in tool production. Of the (1,183) tools that were made on blade blanks, only 0.5% (6) were primary, 13.8% (163) were secondary, and the vast majority, 85.7% (1,014) were tertiary. Overall, the sample of complete blade tools average 62.7mm in length (minimum 14.4mm, maximum 156.0), 24.9mm in width (minimum 12.0, maximum 220.8mm), and 8.1mm in thickness (minimum 1.9, maximum 27.9), which are all significantly higher than the averages for blade debitage (see Table 81). When compared, the boxplots represented in Figures 7 and 8 illustrate these size differences in length, width and thickness between blade tools and blade blanks. These differences between the blade blanks that ultimately became tools and the debitage blade blanks that exhibit no sign of retouch is quite interesting.

The fact that blade tools are larger than blade blanks is contrary to what would be expected, as tools are modified via retouch which has the effect of reducing the size of the original blank. This appears to indicate that larger blade blanks are selected from the debitage blank selection for production into tools. This suggests that blade blanks of longer length were more often selected for use as tools due to their size. The maximum blade tool length (156.0mm) far exceeds the maximum for blade debitage maximum length (127.1mm). The minimum lengths for blade tools (14.4mm) and blade debitage (15.9mm) are generally equivalent. The average length of blade tools is surely distorted based on the conscious selection of atypically long blade blanks for use as tools. The production of such long, fine blade blanks for use in tool production represents the application of a mainland Neolithic tradition.

Table 81 Blade debitage and blade tools average length, width and thickness in mm.

	n	Length	Width	Thickness
Blade Debitage	807	51.7	19.8	6.5
Blade tools	370	62.7	24.9	8.1

Figure 7 Boxplot showing the range of sizes that were selected for use as blade tools.

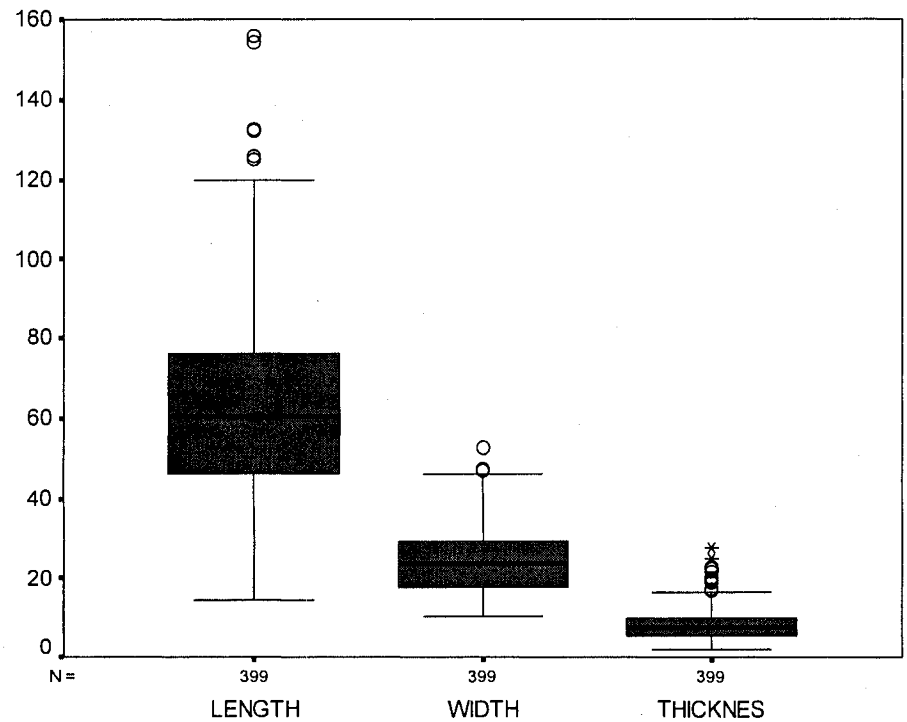
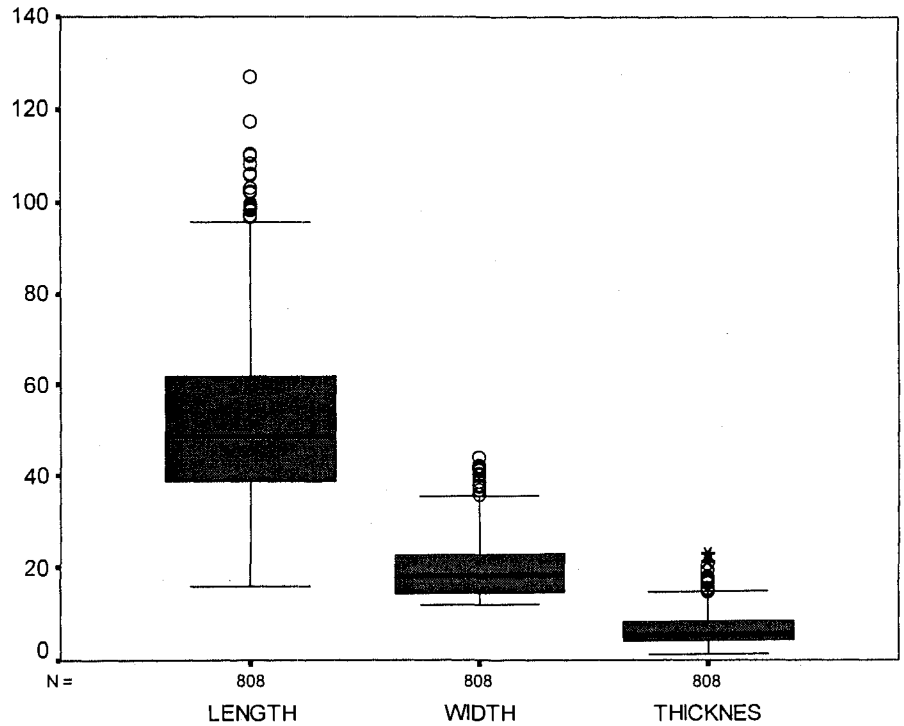


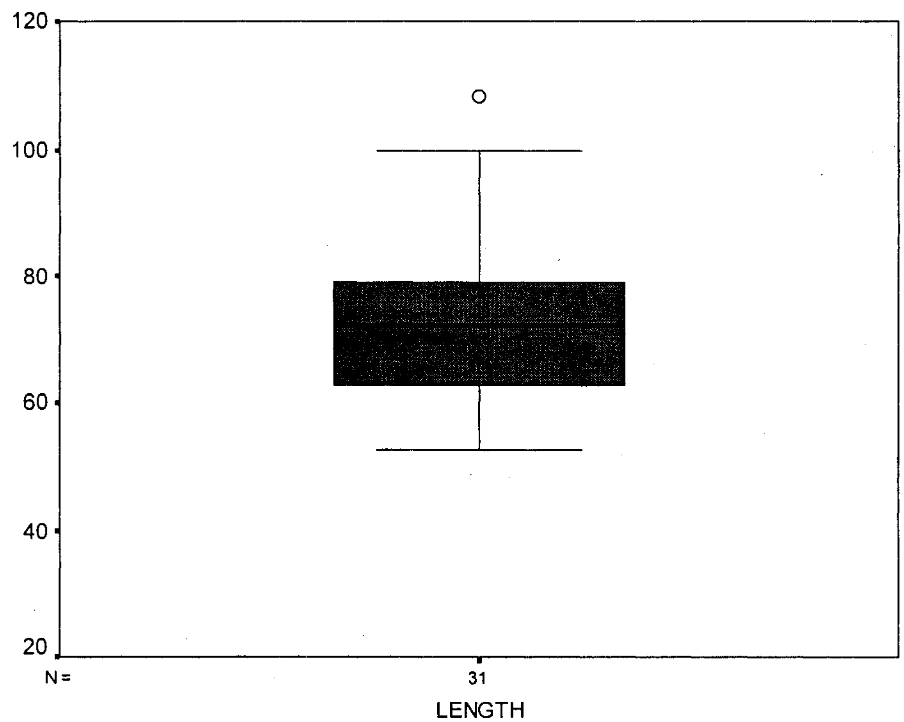
Figure 8 Boxplot showing the range of sizes among blade debitage.



While it has already been demonstrated that blade tools are larger on average than the blade blanks among the debitage, looking more closely at the breakdown of length, width and thickness by blank type can reveal more about the selection of blanks for tool production. The complete tertiary blade tools (n=303) average 61.7mm in length, 22.9mm in width, and 8.0mm in thickness. The tertiary blades among the debitage sample (n=529) average 51.2mm in length, 19.0mm in width, and 6.2mm in thickness. The tertiary blades differ primarily in length with blade tools on average 10mm longer than blade blanks among the debitage. The secondary blade tools (n=66) average 73.9mm in length, 28.2mm in width, and 10.7mm in thickness. When compared to the secondary blade debitage sample (n=255) averaging 53.1mm in length, 20.5mm in width, and 7.3mm in thickness, secondary blade tools are clearly much larger on average in all measurements. Secondary blade tools are over 20mm longer on average, over 8mm in width and 3mm in thickness. Primary blade tools (n=4) average 64.6mm in length, 22.7mm in width, and 8.0mm in thickness. The slightly larger sample of complete blade debitage averages 52.6mm in length, 20.5mm in width, and 9.0mm in thickness. While primary blade tools appear to be longer than debitage blades, the tool sample only includes four pieces and does not represent a viable comparative sample.

In order to take a closer look at the production of blades, the lengths of the blade cores that were identified as viable (not exhausted) were examined. The average length of these cores is 73.3mm, with a maximum of 108.5mm and a minimum of 52.7mm. When comparing the average length to blade debitage (51.7mm) the viable cores offer the ability to produce blades that fall within the full range of debitage blanks (excluding outliers). When examining the average length of blade tools (62.7mm) against the cores, the viable blade cores have the potential to produce blade blanks that fall within the central range and lower quartile of the blade tools (see Figures 7, 8 and 9).

Figure 9 Boxplot showing the range of sizes among viable blade cores.



Flake blanks among the debitage versus the tools also show a marked difference in size, with flake debitage averaging 29.3mm in length, 25.5mm in width, and 6.3mm in thickness. Flake tools are larger, with the sample of complete flake tools averaging 49.1mm in length, 37.6mm in width, and 10.8mm in thickness (see Table 82). Boxplots show a wider range for flake tools in both the inner and outer quartiles (see Figures 10 and 11). The size differences between flake debitage and flake tool appear to reflect the intentional selection of larger flakes for use as tools.

Table 82 Flake debitage and flake tool average length, width and thickness in mm.

	n	Length	Width	Thickness
Flake Debitage	3,408	29.3	25.5	6.3
Flake tools	477	49.1	37.6	10.8

Figure 10 Boxplot showing the range of sizes among flake debitage.

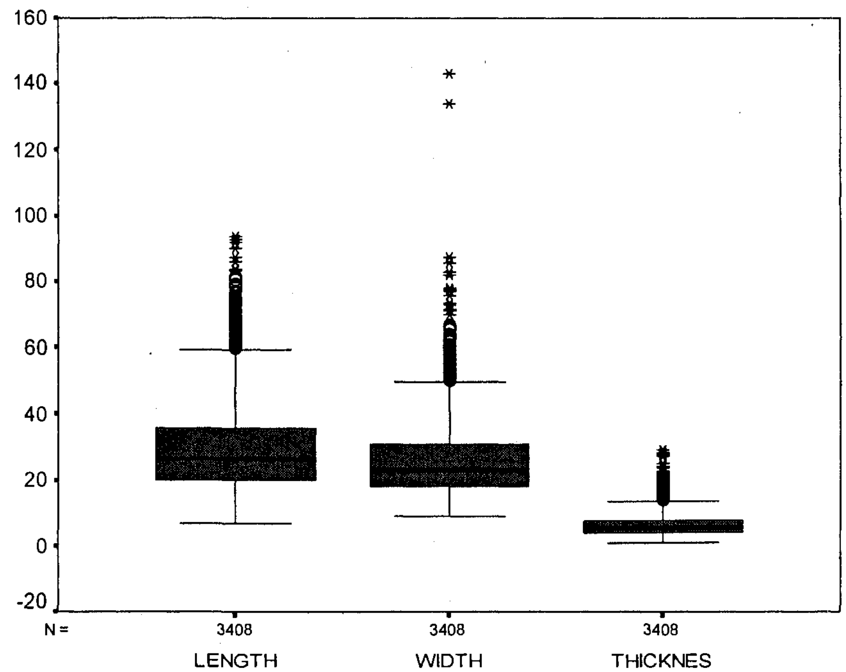
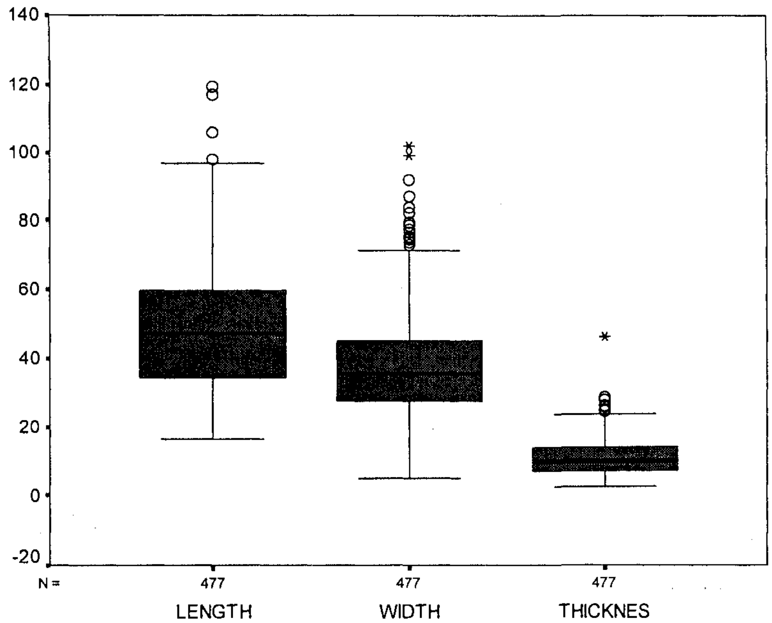


Figure 11 Boxplot showing the range of sizes that were selected for use as flake tools.



6.2.2 Tools and Economic Activities

Can tool class be positively correlated to particular economic activities occurring on-site at *Ais Yiorkis*? Although, as discussed previously, typology and tool function remain highly debated realms of lithic analysis, typology and terminology are considered here to be quite useful and necessary. In terms of the greater tool assemblage, a variety of specific activities that would have been occurring on-site can be directly inferred.

The most commonly occurring tools were retouched blades (29.5%) and retouched flakes (21.6%). Retouched blades and flakes can be used to serve any number of economic purposes. Among both the retouched blades and flakes, 80.7% displayed marginal or semi-steep retouch (nearly 40/40), which are the least invasive types, indicating that the majority were probably more expedient tools used for minor cutting. Scrapers follow with 9.9% of the tool assemblage, 20.2% when the retouched blades and flakes are discounted. The predominance of scrapers among the tools is relevant to economic interpretations, as scrapers have been widely documented ethnographically and experimentally as hide processing tools (Hayden 1979). Scrapers are more generally interpreted as tools that are used for scraping both soft (e.g., hides) and hard materials (e.g., bone) and have been shown to have also been used in wood working (Rosen 1997).

The notched tool class, which makes up 8.6% of the assemblage (17.6% minus retouched blades and flakes) are also interpreted as scraping tools, used for light work, indicative of wood and bone working, shaping, and/or straightening (McConaughy 1979). Burins, totaling 3.4% (6.9% when restricted), with their chisel-like end also facilitate wood working. Backed pieces with 4.4% (8.9% when restricted), truncations with 2.9% (5.9% when restricted), backed-truncations with 0.8% (1.5% restricted), as well as the tang class with 2.5% (5.1% restricted) and Ortos crescents with 1.6% (3.2% restricted) indicate a desire to dull or maintain edges for hand held use and/or hafting, although no remnants or more direct evidence for hafting exists. Sickles and glossed pieces comprise 2.0% (4.0% minus retouched blades and flakes) providing evidence for reaping, plant processing and even wood working (Witthoft 1967). Piercing tools, which make up 1.3% (2.6% minus retouched blades and flakes), are related to hide, bone and wood working, boring and graving. Like scrapers, denticulates, which make up just 1.0% (2.1% minus retouched blades and flakes), were used for hide as well as plant processing or wood working.

None of the activities inferred via tool class differ from typical Aceramic Neolithic activities/assemblages, but they are significant none-the-less for their portrayal of the chipped stone economy and telling of the types of tasks occurring at *Ais Yiorkis*. An examination of how the tool classes are distributed throughout the site and how they relate and/or compare to the *Tenta* assemblages by period will be examined in an attempt to reveal more about intra and inter site economy and chronology.

6.2.3 The Big Picture of Economic Behavior

What does the assemblage reveal about production and/or reduction of chipped stone artifacts related to economic behavior and site use when looked at as a whole? A number of specific questions related to individual aspects of the assemblage have been asked and answered here. All of the data thus far presented can now be considered together to create a larger picture of economic behaviors related to chipped stone reduction and production.

In terms of the raw materials identified among the chipped stone analyzed from *Ais Yiorkis,* the quantities and percentages of different types are relatively consistent between cores, debitage, and tools. This would appear to reflect the import of local raw materials to the site and the reduction of cores, as well as the production of tools on site. Looking specifically at the data related to core reduction and tool production reveals a great deal about what took place at *Ais Yiorkis.* As previously discussed, the presence of cores, debitage, and the massive amount of debris all indicate that a great deal of flintknapping occurred on-site.

The people of *Ais Yiorkis* generally collected and brought their locally quarried raw materials to the site as preformed nodules, yielding very little cortical material and a propensity of tertiary debitage and debris. Raw materials were probably brought to *Ais Yiorkis* at a variety of stages, although the amount of cortical (1.6%) and secondary (12.1%) debitage indicates that nodules were probably not imported "whole." The majority of the initial core or nodule reduction probably occurred at the quarry or site of raw material collection. Lefkara basal was the raw material of choice (80.4%), providing high quality, readily available cores. While other material types were also exploited, the presence of small quantities of imported obsidian is notable for its Anatolian origin.

Cores were reduced on site yielding debris or shatter (chips outnumber chunks, although both occur in high quantities), and debitage or blanks that could be modified into tools. Flake cores dominate, with globular and multidirectional types in the highest quantities. Although blade production technology is not overwhelming within the core population, with blade cores making up just 16.0%, naviform and sub-naviform cores were conspicuously identified among the core assemblage. While flakes constitute the majority the debitage (60.2%) and were the primary blank type produced (75.3% are flake cores), the knappers at *Ais Yiorkis* showed their clear preference for blades in their selection of the tool blanks (49.6%). Despite the propensity of flake cores and flake debitage, blade production was clearly the objective. The ratio of blades to flakes is 1:2.88 among debitage and 1.44:1 among tools. This preference for blade tools and the minimal, but still significant presence of naviform and sub-naviform cores (representing 1.1%) harkens back to a mainland memory of fine blades, projectile points and naviform core technology.

The majority of the tools and debitage display single platforms and blunt ends, suggesting simpler reduction processes. While there was some evidence of burning among the assemblage, with higher percentages among the tools, intentional heat treatment as an economic strategy at *Ais Yiorkis* is unlikely.

Retouched blades and flakes, either expedient or formal constitute the vast majority of the tools (51.0%), followed by scrapers, notched pieces, and backed pieces in the highest quantities, all of which are suggestive of hide and wood working. Glossed pieces and a few projectile points were also identified among the tools, occurring in small quantities. The blade tools were also found to be on average larger in size than their debitage blank counterparts. Among the blade tools are sickles, serrations, knives, tangs and a few crude projectile points.

The types of blanks produced, those selected for tools, and the types of tools made all inform about the chipped stone economy employed by the people of *Ais Yiorkis.* The chipped stone economy at *Ais Yiorkis* reveals skilled knappers with clear intent, who maximized their raw materials, despite availability, and who showed meticulous preferences in tool production and use.

6.3 Intra-site Distribution of Chipped Stone

In order to further examine how the chipped stone assemblage relates to site function and economics, contextual analyses looking at distribution follows. Unfortunately this analysis can only provide limited and preliminary interpretations related to how the various classes and types of chipped stone are distributed throughout the site, as the majority of the great contextual populations have come from subsequent seasons. The questions asked and answered here relate specifically to the assemblage recovered from the units and levels excavated between 1997 and 2004, which were discussed in Chapter 4 (see Table 83, Figures 3 and 12). While more recent excavations have uncovered additional features and architectural remains, the chipped stone and other analyses are still underway. Although this contextual analysis will eventually be expanded to examine the entire site and may ultimately change our interpretations related to distribution, this analysis is useful and relevant to the greater understanding of the chipped stone assemblage, the site and its people to date.

In order to directly address chipped stone distribution throughout the site, while attempting to answer questions about site use and disposal patterns it was necessary to limit the range of the analysis to the most fundamental aspects of the chipped stone that were the most telling, and for which the most information was obtained. This distribution analysis focuses on the more superficial aspects of the assemblage such as blank type, opposed to more specific attributes (e.g., platform type), as these are the most informative. As formal chipped stone tools are useful in examining site use and have been fully recorded during laboratory analysis an examination of their distribution has been conducted. The distribution of debitage, cores and debris have also been examined as such pieces reflect production and economic activities, and deposition as well. The way in which these independent chipped stone populations relate to one another will also be considered in terms of distribution.

6.3.1 Site Formation

A variety of processes have been identified as having acted on the formation of the site. A relatively recent bulldozer cut defines the eastern boundary of Feature 1 and appears to have removed a small portion of the feature's foundation, apparently pushing it over the cliff edge. As the southeast and northeast quadrants of unit 15N15W, surface scrapes 1 to 7, the surface collection, test pits 1, 2 and 3, and test trench 1 (see

Figures 3 and 12) are located within a modern agricultural field, the effects of plowing and plant/tree roots would appear obvious and indicate that it is less likely that any in situ materials would be recovered from these areas. Krotovina has also had an impact on site formation, although to a lesser extent. While conducting excavations the presence of small animal, insect and reptile tunnels were noted. Flood/rain wash also played a role in the formation of the site. It is apparent that rainwater had washed soils and archaeological remains from the site where Feature 1 was exposed by the bulldozer cut. "Washed" remains would have been carried over the cliff and thereby removed from the primary site and from any secure context. Artificial terracing, as is common in Cyprus, may also have had an effect on the formation of the site, having created the lower and upper fields, terracing may have removed or disturbed in situ remains. Despite these natural and cultural disturbances, secure deposits have been identified, including the units surrounding Feature 1, and the Feature 2 blade cache.

6.3.2 Overall Distribution

An examination of the distribution of the chipped stone reveals that 75.1% of the assemblage is dispersed between just six units. The southeast quadrant of unit 10N20W (the suggested primary midden deposit), a 2 by 2m unit that was excavated through 12 levels to a depth of ~1.2m contained the majority, with 21.7% of the assemblage. Test Trench 2, unit 20N40W, a 2 x 3m unit of 9 levels excavated to ~1m in depth is the next most dense with 15.1%. Section D, the southwest quadrant of 10N15W, a 2 x 2m unit of 8 levels excavated to a depth of ~1.6m with 11.5%, and the northeast quadrant of unit 5N20W a 2 x 2m unit excavated in 6 levels to a depth of ~1.2m with 11.4% follow. Also among the most dense units are the northeast quadrant of unit 15N25W a 2.5 x 2.5m unit excavated in 13 levels to 2.75m in depth with 9.7%, and Section C, the northwest quadrant of unit 15N20W, which was excavated in 7 levels to a depth of 2.6m with 8.4% of the chipped stone assemblage. The remaining units have comparatively low densities, with many under 1% (see Table 83). The densities of the surface scrapes and probes, which were among the earliest investigations at the site, were calculated and used to determine the locations for formal sections, test pits, trenches and excavation units in subsequent seasons. For example, Section A encouraged initial testing in the upper field.

Table 83 Distribution of the chipped stone assemblage by unit. Unit size and the number of levels excavated per unit are also provided.

Unit/Quadrant/Subquadrant	Size (m^2)	Levels	n	%
Probe 1	.5x.5	1	19	0.0
Probe 2	.5x.5	1	25	0.0
Probe 3	.5x.5	1	4	0.0
Surface Collections		Surface	142	0.7
Surface Scrape 1	5x5	Surface	163	0.3
Surface Scrape 2	5x5	Surface	59	0.1
Surface Scrape 3	5x5	Surface	10	0.0
Surface Scrape 4	5x5	Surface	59	0.1
Surface Scrape 5	5x5	Surface	125	0.2
Surface Scrape 6	5x5	Surface	4	0.0
Surface Scrape 7	5x5	Surface	1	0.0
15N20W Section A	1x1	5	538	1.0
10N15W Section B	1x1	2	684	1.3
15N20W Section C	1x1	7	4,304	8.4
10N15W Test Pit 1	1x1	3	322	0.6
27N16E Test Pit 2	1x1	3	1,130	2.2
30N01E Test Pit 3	1x1	1	500	1.0
20N75W Test Pit 4	1x1	2	0	0.0
5N50W Test Pit 5	1x1	2	1	0.0
5N45W Test Pit 6	1x1	1	3	0.0
25N10W Test Trench 1	4x1	7	138	0.3
20N40W Test Trench 2	2x3	9	7,712	15.1
15N15W SE Quadrant	2.5x2.5	2	1,592	3.1
15N15W SW Quadrant	2.5x2.5	1	1,217	2.4
5N15W NW Quadrant	2x2	3	508	1.0
5N15W NW Quadrant Wedge 1	.85x1.30	3	545	1.1
5N15W NE Quadrant Wedge 2	1x1.5	3	259	0.5
5N20W NE Quadrant	2x2	6	5,822	11.4
5N20W SE Quadrant	2x2	4	2,918	5.7
10N20W SE Quadrant	2x2	12	11,131	21.7
15N25W NE Quadrant	2.5x2.5	13	4,946	9.7
10N15W SE Quadrant	2x2	1	73	0.1
10N15W SW Quadrant Feature 2 Section D	.2x.15	1	34	0.1
10N15W SW Quadrant Section D	2x2	8	5,889	11.5
5N15W Feature 1 Section 1	1x1	3	225	0.4
5N15W Feature 1 Section 2	.3x.10	1	34	0.1
5N15W Feature 1 Section 3 NEQ Wedge 1	2x.5	1	104	0.2
5N20W Feature 1 Section 4	.5x.5	1	0	0.0
Total			51,240	100

Figure 12 *Ais Yiorkis* site map.

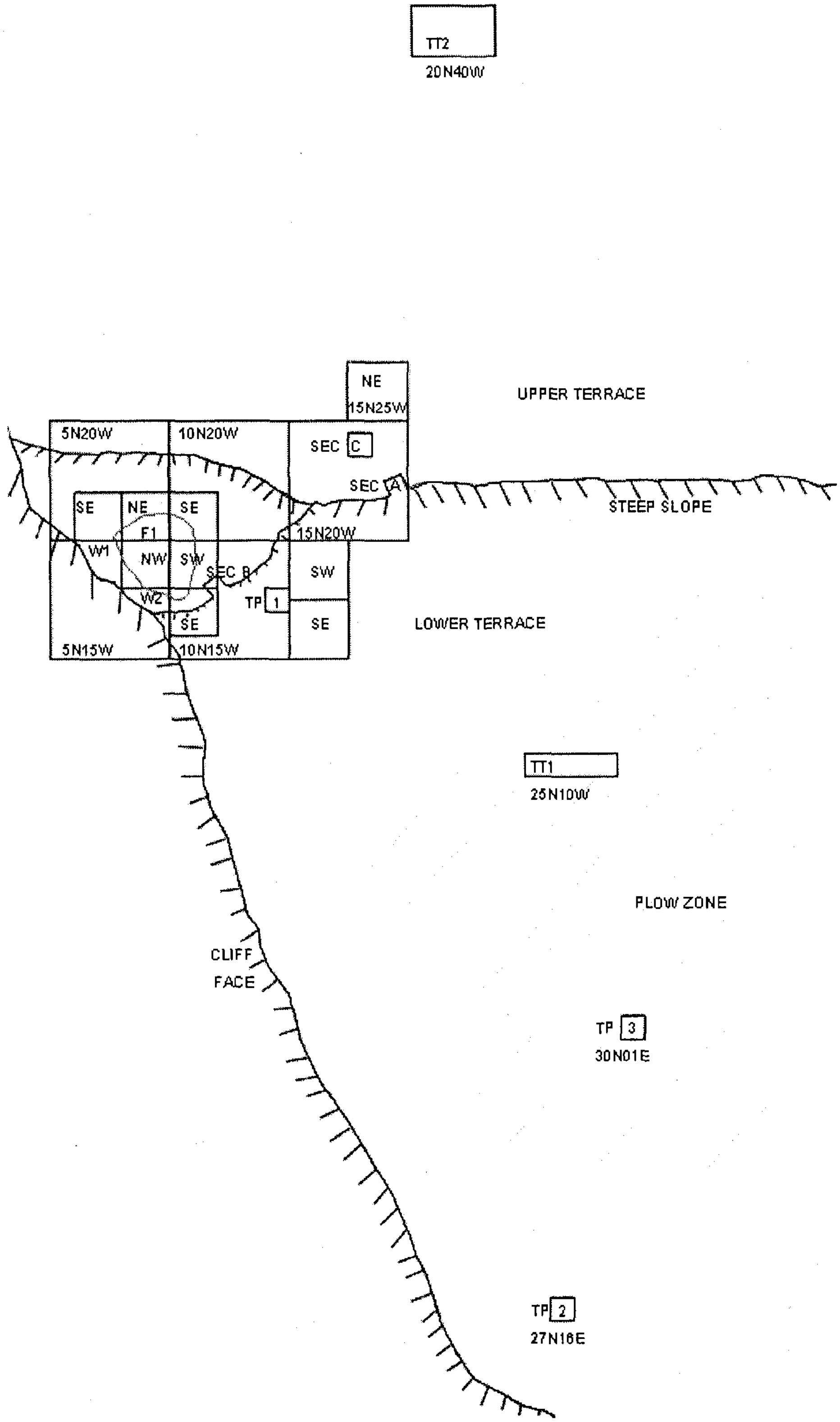
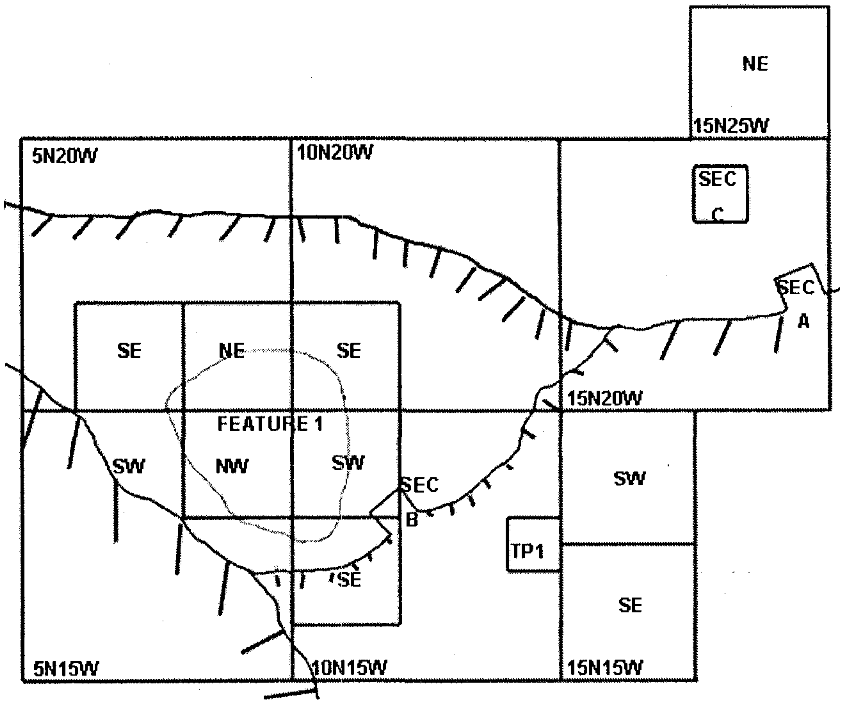


Figure 13 *Ais Yiorkis* site map spotlighting the bulk of the excavations.



The densest unit, the southeast quadrant of 10N20W, adjacent to Feature 1, represents the bulk of what has been considered a midden deposit. When looking at distribution in general it is important to note that the units and quadrants are arbitrarily defined in order to aid in excavation, mapping, artifact recording and site description. The high density of the southeast quadrant of unit 10N20W reported here along with the massive amounts of faunal remains recovered further substantiates the unit's status as a midden. The proximity and densities in the units adjacent to the southeast quadrant of 10N20W, the southwest quadrant of 10N15W and the northeast quadrant of unit 5N20W indicate that the three units or portions thereof represent a single midden area within the site. Of the 38 test and excavation units investigated in the 1997, 2002, 2003, and 2004 seasons, 13 are in some direct way associated with Feature 1. The identification of Feature 1, via 10N15W Section B, dictated the placement of these units. The units surrounding and sectioning Feature 1 constitute

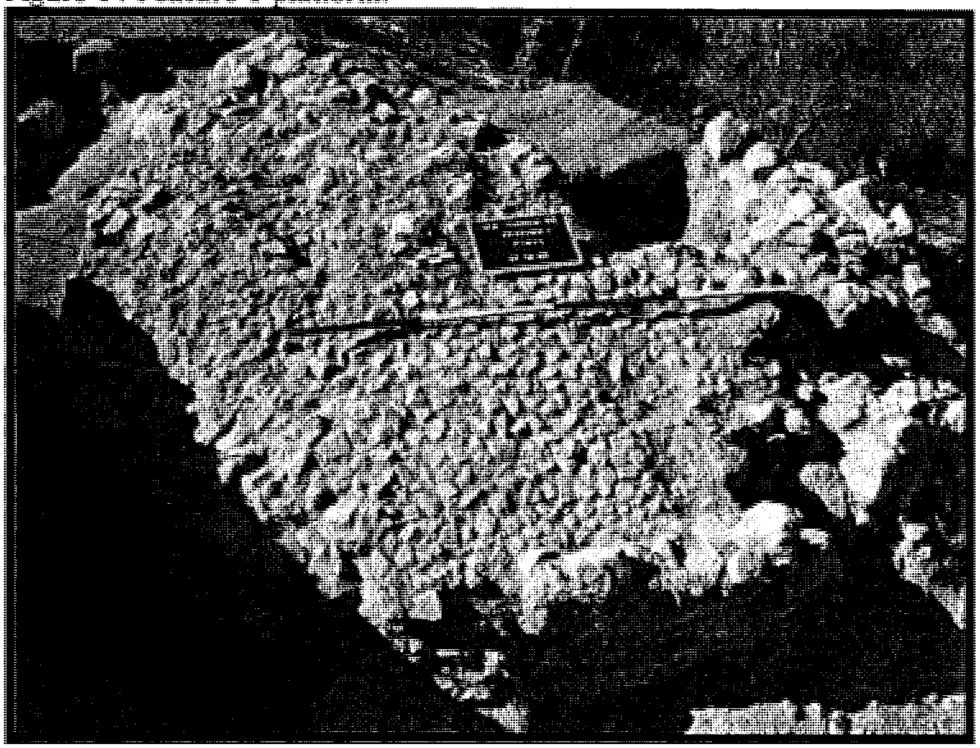
55.1% of the assemblage from the excavations considered here (see Table 84).

Table 84 Distribution of chipped stone within the units immediately surrounding Feature 1.

Unit/Quadrant/Subquadrant	n	%
10N20W SE Quadrant	11,131	39.4
10N15W SW Quadrant Section D	5,889	20.9
5N20W NE Quadrant	5,822	20.6
5N20W SE Quadrant	2,918	10.3
10N15W Section B	684	2.4
5N15W NW Quadrant Wedge 1	545	1.9
5N15W NW Quadrant	508	1.8
5N15W NE Quadrant Wedge 2	259	0.9
Feature 1 Section 1 5N15W	225	0.8
Feature 1 Section 3 5N15W NEQ Wedge 1	104	0.4
10N15W SE Quadrant	73	0.3
Feature 1 Section 2 5N15W	34	0.1
Feature 2 Section D 10N15W SW Quadrant	34	0.1
Total	28,226	100

Feature 1 (see Figure 13) is the largest most significant in situ feature and/or architectural remnants uncovered thus far at *Ais Yiorkis*. The feature measures approximately four meters in diameter, and appears to represent a circular stone platform or structure. Excavations revealed an impressive flat, "paved" stone surface, which sits atop an apparent mound of stone and soil, which, when sectioned, was found to contain very little cultural material. The base of the structure is flanked with very large stones, which were then faced with smaller stones (Simmons 2004, 2005). The feature is a structural anomaly on Cyprus as nothing like it has ever been excavated before. Although circular architecture is commonplace in the Cypriot Aceramic Neolithic, Feature 1 seems to represent a platform rather than a formal structure. Architectural features found at Khirokitia and *Tenta* do not exhibit faced floors, but rather consist of hard packed dirt floors. While typical architecture is characterized by well-made stone walls, Feature 1 does not contain evidence for collapsed walls (Todd 1979).

Figure 14 Feature 1 platform.



6.3.3 Distribution by Chipped Stone Population

A primary question looking at distribution relates to the way in which different chipped stone artifact populations are distributed throughout the site. The question posed here asks: What do the tool, debitage, debris and core populations tell about economics and site use based on their independent distribution?

6.3.3.1 Debris

As discussed in Chapter 5, high quantities of debris, chips and chunks (n=20,367) were recorded among the assemblage. The presence of so much debris can be interpreted in one of two ways. As debris is the natural result of knapping, the most obvious explanation for the amount relates to on-site core reduction. While the amount of more formal debitage outnumbers the debris, and seemingly substantiates the large scale on-site reduction interpretation, *Ais Yiorkis* as it exists today is within a modern and historic field, which has undergone both hand plowing as well as more modern machine disturbance via plowing. Despite the known effects of plowing on chipped stone assemblages and the known plowing at *Ais Yiorkis*, the probable effects have been assumed to be relatively minimal due to a number of factors including the evolution of plowing tools which switched to more modern equipment only in the past ~30 years. The property on which the site is located was known to have been historically Turkish and laid fallow for many years post-1974. The primary plant grown on the land since its more modern use is pistachio, which requires relatively little maintenance. Looking more closely at distribution allows a clearer picture of the debris and its production.

What does the distribution of debris reveal about site use and chipped stone economy at *Ais Yiorkis*? In terms of debris, the highest quantity was recovered from the primary midden unit, the southeast quadrant of 10N20W with 17.0% (see Table 85). The units adjacent to the midden were also among the top five. Section D in the southwest quadrant of 10N15W contained 14.5% and the northeast quadrant of 5N20W, 11.6%. Test Trench 2, 20N40W with 13.7% and Section C in unit 15N20W with 11.9%, both in the upper field, round out the highest density units. High rates of debris found within the midden deposits are unsurprising, although the comparatively lower quantities in the known plow zone units were. While the overall rates of debris in the plow zone deposits are low compared to the midden and other deposits, debris still dominates these deposits.

Over 50% of the chunks were recovered from three units including, the southeast quadrant of unit 10N20W (23.0%), Test Trench 2, unit 20N40W (16.1%), and the northeast quadrant of 15N25W (12.8%). The chips were slightly less concentrated, with the majority distributed more evenly through five units that include the southeast quadrant of unit 10N20W (16.3%), Section D in the southwest quadrant of unit 10N15W (15.2%), Test Trench 2, unit 20N40W (13.4%), Section C in the northwest quadrant of 15N20W (12.4%), and the northeast quadrant of 5N20W (12.1%).

Table 85 Distribution of debris.

	All Debris		Chunks		Chips	
Unit	n	%	n	%	n	%
Surface Scrape 1	60	0.3	28	1.3	32	0.2
Surface Scrape 2	22	0.1	7	0.3	15	0.1
Surface Scrape 3	4	0.0	0	0.0	4	0.0
Surface Scrape 4	21	0.1	5	0.2	16	0.1
Surface Scrape 5	48	0.2	9	0.4	39	0.2
Surface Scrape 6	1	0.0	0	0.0	1	0.0
Surface Scrape 7	1	0.0	1	0.0	0	0.0
Probe 1	10	0.0	3	0.1	7	0.0
Probe 2	8	0.0	2	0.1	6	0.0
Probe 3	1	0.0	0	0.0	1	0.0
10N15W Test Pit 1	166	0.8	23	1.1	143	0.8
Surface Collection	17	0.1	10	0.5	7	0.0
5N45W Test Pit 6	1	0.0	1	0.0	0	0.0
5N50W Test Pit 5	1	0.0	1	0.0	0	0.0
30N01E Test Pit 3	193	0.9	50	2.3	143	0.8
10N15W Section B	358	1.8	40	1.8	318	1.7
15N20W Section A	240	1.2	32	1.5	208	1.1
5N20W SE Quadrant	907	4.5	61	2.8	846	4.7
5N20W NE Quadrant	2,368	11.6	166	7.6	2,202	12.1
27N16E Test Pit 2	571	2.8	25	1.1	546	3.0
25N10W Test Trench 1	51	0.3	17	0.8	34	0.2
20N40W Test Trench 2	2,796	13.7	351	16.1	2,445	13.4
10N20W SE Quadrant	3,460	17.0	502	23.0	2,958	16.3
5N15W NW Quadrant Wedge 1	264	1.3	43	2.0	221	1.2
15N20W Section C	2,414	11.9	162	7.4	2,252	12.4
5N15W Section 2 Feature 1	8	0.0	5	0.2	3	0.0
5N15W Section 1 Feature 1	48	0.2	11	0.5	37	0.2
15N15W SW Quadrant	600	2.9	60	2.8	540	3.0
15N15W SE Quadrant	961	4.7	41	1.9	920	5.1
10N15W SW Quadrant Sec D	2,946	14.5	188	8.6	2,758	15.2
10N15W SE Quadrant	14	0.1	0	0.0	14	0.1
15N25W NE Quadrant	1,522	7.5	278	12.8	1,244	6.8
5N15W NEQ Sec3 Feat1 Wedge 1	26	0.1	3	0.1	23	0.1
5N15W NE Quadrant Wedge 2	65	0.3	5	0.2	60	0.3
5N15W NW Quadrant	194	1.0	49	2.2	145	0.8
Total	20,367	100	2,179	100	18,188	100

6.3.2.2 Cores

What does the distribution of cores reveal about site use and chipped stone economy at *Ais Yiorkis*? Interestingly, the northeast quadrant of 15N25W is the most dense unit with 20.5% of the cores, followed by the southeast quadrant of 10N20W with

18.7%, Test Trench 2/20N40W with 16.0%, and the southwest quadrant of 10N15W, Section D with 13.8% (see Table 86). The northeast quadrant of unit 15N25W and Test Trench 2 are both located in the upper field in close proximity to one another. Oher high concentration units are the primary midden deposit and the adjacent unit.

Table 86 Distribution of cores by unit.

Unit	Cores	
	n	%
Surface Scrape 1	2	0.4
Surface Scrape 2	1	0.2
Surface Scrape 3	1	0.2
Surface Scrape 5	3	0.7
10N15W Test Pit 1	1	0.2
Surface Collection	7	1.5
30N01E Test Pit 3	5	1.1
10N15W Section B	14	3.1
15N20W Section A	2	0.4
5N20W SE Quadrant	6	1.3
5N20W NE Quadrant	27	6.0
27N16E Test Pit 2	10	2.2
25N10W Test Trench 1	5	1.1
20N40W Test Trench 2	72	16.0
10N20W SE Quadrant	84	18.7
5N15W NW Quadrant Wedge 1	1	0.2
15N20W Section C	30	6.7
5N15W Section 1 Feature 1	1	0.2
15N15W SW Quadrant	10	2.2
15N15W SE Quadrant	6	1.3
10N15W SW Quadrant Section D	64	13.8
15N25W NE Quadrant	92	20.5
5N15W NE Quadrant Wedge 2	1	0.2
5N15W NW Quadrant	4	0.9
Total	449	100

When the cores are looked at more specifically by type, the distribution does not reveal any notable trends. The units with the greatest densities of cores have the broadest distribution of types, especially including the northeast quadrant of 15N25W, the southeast quadrant of 10N20W, Test Trench 2, and Section D (see Table 87). Even those units with few cores have a broad range of types (e.g., the southeast quadrant of 15N15W).

Table 87 Distribution of core types by unit (see Table 27 for core type totals). "F" indicates flake core and "B" indicates blade core.

	15N25W NEQ	10N20W SEQ	20N40W TT 2	10N15W Section D	15N20W Section C	5N20W NEQ	10N15W Section B	15N15W SWQ	27N16E TP 2	Surface
F- Globular	16	10	9	13	3	5	5	1	0	0
F- Fragment	15	16	9	11	3	4	0	2	2	0
F- Multidirectional	16	4	12	7	7	6	0	3	1	1
Bladelet	7	4	4	2	2	1	1	1	1	1
F- Akrotiri	6	6	5	8	5	0	0	0	2	0
B- Single	4	7	6	2	3	1	0	0	1	1
B- Fragment	4	5	3	5	1	1	0	0	0	0
F- Spheroidal	1	14	3	1	1	2	0	0	0	1
F- Discoidal	1	7	7	1	0	3	0	0	0	0
F- Core on flake	3	1	3	2	2	0	0	1	1	0
B- Opposed	3	3	1	1	0	1	0	1	0	0
F- Single platform	4	1	1	1	0	1	1	0	0	1
F- Sub-Discoidal	4	0	3	1	0	0	1	0	0	2
Indeterminate- Fragment	0	0	0	0	0	0	6	0	0	0
F- Bidirectional	1	0	3	1	0	0	0	0	0	0
B- 90 Degrees	2	0	1	0	1	0	0	0	0	0
Bladelet- Fragment	0	2	0	1	1	0	0	0	0	0
F- Sub-Pyramidal	0	0	0	2	1	0	0	1	0	0
F- Material Test	1	1	0	2	0	0	0	0	1	0
B- Naviform	2	0	1	0	0	0	0	0	0	0
F-90 degrees	0	1	0	1	0	1	0	0	0	0
F- Opposed Platform	0	1	0	1	0	1	0	0	1	0
B- Sub-Naviform	1	1	0	0	0	0	0	0	0	0
B- Core on Blade	1	0	0	0	0	0	0	0	0	0
F- Pyramidal	0	0	1	0	0	0	0	0	0	0
F- Tabular	0	0	0	1	0	0	0	0	0	0
Total	92	84	72	64	30	27	14	10	10	7

Table 87 Continued. Distribution of core types by unit.

	15N15W SEQ	5N20W SEQ	30N01E TP 3	25N10W TT 1	5N15W NWQ	Surface Scrape 5	Surface Scrape 1
F- Globular	0	0	0	1	0	1	1
F- Fragment	1	1	1	1	1	0	0
F- Multidirectional	1	1	1	2	1	0	0
Bladelet	0	1	0	0	0	0	1
F- Akrotiri	1	0	0	0	1	1	0
B- Single	1	1	1	0	0	0	0
F- Discoidal	0	0	0	0	1	0	0
F- Core on Flake	0	0	1	0	0	0	0
B- Opposed	1	0	0	0	0	1	0
F- Sub-Discoidal	0	0	1	0	0	0	0
F- Bidirectional	1	0	0	0	0	0	0
B- Fragment	0	2	0	0	0	0	0
F- Material Test	0	0	0	1	0	0	0
Total	6	6	5	5	4	3	2

	15N20W Section A	5N15W WEDGE 2	FEAT1 SEC1 5N15W	5N15W WEDGE 1	Surface Scrape 2	Surface Scrape 3	10N15W TP 1
F- Globular	2	1	0	0	0	0	0
F- Akrotiri	0	0	1	0	0	0	0
B-fragment	0	0	0	1	0	0	0
F- Sub-Discoidal	0	0	0	0	1	0	0
Indeterminate- Fragment	0	0	0	0	0	1	1
Total	2	1	1	1	1	1	1

6.3.2.3 Debitage

What does the distribution of debitage reveal about site use and chipped stone economy at *Ais Yiorkis*? The majority of debitage was recovered from the southeastern quadrant of unit 10N20W with 25.3% (see Table 88). The debitage distribution within this primary midden unit is among the highest percentage reported for any given chipped stone population for any unit. Test Trench 2, 20N40W contained 16.2% of the debitage, followed by the northeast quadrant of unit 5N20W, and the northeast quadrant of unit 15N25W with 10.5%. All other units contained less than 10% of the total, with most having less than 1%.

Table 88 All debitage by unit.

Unit/Quadrant/Subquadrant	n	%
Probe 1	8	0.0
Probe 2	16	0.1
Probe 3	2	0.0
Surface Collection	77	0.3
Surface Scrape 1	96	0.3
Surface Scrape 2	33	0.1
Surface Scrape 3	4	0.0
Surface Scrape 4	35	0.1
Surface Scrape 5	72	0.3
Surface Scrape 6	3	0.0
10N15W Test Pit 1	146	0.5
5N45W Test Pit 6	2	0.0
30N01E Test Pit 3	252	0.9
15N20W Section A	290	1.0
10N15W Section B	302	1.1
15N20W Section C	1,622	5.8
27N16E Test Pit 2	459	1.6
25N10W Test Trench 1	73	0.3
20N40W Test Trench 2	4,553	16.2
15N15W SE Quadrant	572	2.0
15N15W SW Quadrant	514	1.8
5N15W NW Quadrant	271	1.0
5N15W NW Quadrant Wedge 1	254	0.9
5N15W NE Quadrant Wedge 2	185	0.7
5N20W NE Quadrant	3,304	11.8
5N20W SE Quadrant	1,954	7.0
10N20W SE Quadrant	7,093	25.3
15N25W NE Quadrant	2,954	10.5
10N15W SE Quadrant	55	0.2
10N15W SW Quadrant Section D Feature 2	17	0.1
10N15W SW Quadrant Section D	2,547	9.1
5N15W Section 1 Feature 1	168	0.6
5N15W Section 2 Feature 1	26	0.1
5N15W NEQ Section 3 Feature 1 Wedge 1	77	0.3
Total	28,036	100

For each type, the highest densities were found within the four units discussed above. All blank types, with the exception of core trimming elements were found in highest quantities within the primary midden unit, the southeast quadrant of 10N20W, indicating that for the most part no specific type of debitage was purposefully included in or excluded from this type of deposit or disposal (see Tables 89 and 90). Overall, core trimming elements were found in very small quantities, with the highest percentage equally distributed through three units (see Table 90). Tertiary flakes and blades dominating the blank types almost every unit. In units where very few flakes or blades were recovered, secondary and tertiary may be found in equal amounts (e.g., Feature 2 Section D in southwest quadrant of 10N15W) and on occasion secondary pieces may outnumber tertiary (e.g., Feature 1, Section 2 unit 5N15W), but at large tertiary blanks dominate each unit and occur in the highest quantities within the units with the overall highest quantities. In only one unit do blade debitage blanks exist in higher quantities than flakes, but only exceed by 5 pieces. Bladelets do not outnumber tertiary blades in any single unit, but are found in higher densities than primary and secondary blades in many units.

Table 89 Debitage distribution; blank type by unit, including primary, secondary and tertiary flakes, primary, secondary and tertiary blades, and bladelets.

Unit	Prim Flake	Sec Flake	Tert Flake	Prim Blade	Sec Blade	Tert Blade	Bldlt
Surface Scrape 1	0	21	43	0	4	21	1
Surface Scrape 2	0	6	16	0	0	10	1
Surface Scrape 3	0	2	2	0	0	0	0
Surface Scrape 4	1	5	17	1	2	5	1
Surface Scrape 5	3	13	29	0	2	20	1
Surface Scrape 6	1	0	0	0	1	1	0
Probe 1	1	0	1	0	0	4	1
Probe 2	0	2	7	0	0	4	2
Probe 3	0	2	0	0	0	0	0
10N15W Test Pit 1	3	6	50	0	9	55	8
Surface Collection	2	21	34	0	7	11	0
5N45W Test Pit 6	0	0	1	0	0	1	0
30N01E Test Pit 3	5	23	116	1	12	47	8
10N15W Section B	5	19	130	0	10	94	19
15N20W Section A	5	21	126	1	10	67	22
5N20W SE Quadrant	8	155	1,075	0	39	223	144
5N20W NE Quadrant	39	269	1,539	8	77	500	236
27N16E Test Pit 2	11	28	228	0	10	91	22
25N10W Test Trench 1	9	14	37	0	3	3	5
20N40W Test Trench 2	81	477	2,426	4	144	832	247
10N20W SE Quadrant	82	721	3,688	13	226	1,221	364
5N15W NW Quadrant Wedge 1	3	13	115	0	3	26	15
15N20W Section C	16	94	708	2	40	239	113
5N15W Section 2 Feat 1	0	10	9	0	1	3	1
5N15W Section 1 Feat 1	1	9	86	0	3	39	11
15N15W SW Quadrant	8	59	230	0	9	83	39
15N15W SE Quadrant	6	44	240	0	11	95	51
10N15W SW Quadrant Section D Feature 2	0	4	4	0	2	7	0
10N15W SW Quadrant Section D	38	140	1,169	4	55	529	178
10N15W SE Quadrant	0	4	28	0	2	9	3
15N25W NE Quadrant	49	349	1,509	18	96	649	109
5N15W NEQ Section 3 Feature 1 Wedge 1	1	4	43	0	2	16	5
5N15W NE Quadrant Wedge 2	5	15	94	0	7	37	14
5N15W NW Quadrant	4	26	105	2	13	55	22
Total	387	2,576	13,905	54	800	4,997	1,643

Looking more closely at the distribution of the remaining debitage blank types, core trimming elements, core tablets, burin spalls and microflakes, does not reveal any particular trends (see Table 90). Microflakes are the third largest blank population among the debitage, after tertiary flakes and blades, and follow the same general distribution trends.

Table 90 Debitage distribution; blank type by unit, including core trimming elements, core tablets, burin spalls, and microflakes.

Unit	Core Trim Element	Core Tablet	Burin Spall	Micro Flake
Surface Scrape 1	3	0	2	1
Surface Scrape 4	0	0	0	3
Surface Scrape 5	0	0	0	4
Probe 1	0	1	0	0
Probe 2	0	0	1	0
10N15W Test Pit 1	2	0	2	11
Surface Collection	1	1	0	0
30N01E Test Pit 3	2	1	2	35
10N15W Section B	1	0	6	18
15N20W Section A	5	0	4	29
5N20W SE Quadrant	4	0	1	305
5N20W NE Quadrant	10	5	19	602
27N16E Test Pit 2	1	0	5	63
25N10W Test Trench 1	1	0	0	1
20N40W Test Trench 2	19	3	19	301
10N20W SE Quadrant	24	3	34	717
5N15W NW Quadrant Wedge 1	1	1	1	76
15N20W Section C	7	2	9	392
5N15W Section 2 Feature 1	0	0	0	2
5N15W Section 1 Feature 1	0	0	1	18
15N15W SW Quadrant	0	1	8	77
15N15W SE Quadrant	7	0	7	111
10N15W SW Quadrant Section D Feature 2	0	0	0	0
10N15W SW Quadrant Section D	11	1	12	410
10N15W SE Quadrant	1	0	0	8
15N25W NE Quadrant	20	5	7	143
5N15W NEQ Section 3 Feature 1 Wedge 1	0	0	1	5
5N15W NE Quadrant Wedge 2	0	1	0	12
5N15W NW Quadrant	2	0	4	38
Total	122	25	145	3,382

6.3.2.4 Tools

What does the distribution of tools reveal about site use and chipped stone economy at *Ais Yiorkis*? The majority (over 60%) of the tools are dispersed between four units. The southeast quadrant of unit 10N20W contained the majority of the tools with 20.7%, followed by the northeast quadrant of unit 15N25W with 15.8%, Section D in unit 10N15W with 13.9%, and Test Trench 2/unit 20N40W contained 12.2%. All other units contained less than 10% of the tool total (see Table 91). Overall, the analysis of tool distribution reveals that the majority of the tools were recovered from the midden unit. When the primary midden unit is combined with the east and north conjoining units, which have lesser densities but surely constitute the fringes of the midden, they total 39.8% of the tools. Outside of the midden, Test Trench 2 and the northeast quadrant of 15N25W, both considered in situ deposits, in the upper field also have considerably high densities.

Table 91 Distribution of tools by unit.

	Tools	
Unit	n	%
Surface Scrape 1	4	0.2
Surface Scrape 2	2	0.1
Surface Scrape 3	1	0.0
Surface Scrape 4	3	0.1
Surface Scrape 5	4	0.2
Probe 1	1	0.0
Probe 2	1	0.0
10N15W Test Pit 1	9	0.4
Surface Collection	41	1.7
30N01E Test Pit 3	49	2.1
10N15W Section B	11	0.5
15N20W Section A	6	0.3
5N20W SE Quadrant	51	2.1
5N20W NE Quadrant	124	5.2
27N16E Test Pit 2	90	3.8
25N10W Test Trench 1	9	0.4
20N40W Test Trench 2	291	12.2
10N20W SE Quadrant	493	20.7
5N15W NW Quadrant Wedge 1	26	1.1
15N20W Section C	237	9.9
5N15W Section 1 Feature 1	8	0.3
15N15W SW Quadrant	93	3.9
15N15W SE Quadrant	53	2.2
10N15W SW Quadrant Section D Feature 2	17	0.7
10N15W SW Quadrant Section D	332	13.9
10N15W SE Quadrant	4	0.4
15N25W NE Quadrant	378	15.8
5N15W NEQ Section 3 Feature 1 Wedge 1	1	0.0
5N15W NE Quadrant Wedge 2	8	0.3
5N15W NW Quadrant	39	1.6
Total	2,386	100

A total of 2,386 tools were identified among *Ais Yiorkis* assemblage. An analysis of the distribution of tools by class can potentially identify specific task areas, and can provide information about site use. When tool classes are looked at more closely, retouched blades, the largest tool class, unsurprisingly prove to have the widest distribution, and are found in all but eight units. Scrapers, which are the most occurring tool class after retouched blades and flakes, are also widely distributed and are found in all but nine units. In general the distribution of tools by class through units is unsurprising (see Tables 92). For the most part each class is found in the highest quantities within the units with the highest numbers of tools.

Table 92 Distribution of tool class by unit.

Unit	Ret Blades	Ret Flakes	Scrapers	Notches	Tool Frags	Backed	Burins	Trun-cations	Tang	Sickles/ glossed	Micro-liths
10N20W SE Quadrant	128	100	54	37	34	26	12	16	15	10	9
15N25W NE Quadrant	98	87	60	38	13	10	13	11	5	9	3
10N15W SW Quadrant Section D	129	77	23	19	8	16	11	9	7	6	4
15N20W Section C	75	72	11	27	5	3	8	4	7	2	11
20N40W Test Trench 2	69	57	34	31	11	14	8	5	12	11	4
15N15W SW Quadrant	32	11	8	9	3	8	4	0	3	3	2
5N20W NE Quadrant	37	20	15	6	6	8	4	9	4	2	2
27N16E Test Pit 2	32	22	0	8	4	5	1	4	2	1	1
30N01E Test Pit 3	21	7	3	6	5	2	1	2	1	0	1
15N15W SE Quadrant	16	10	5	7	1	2	4	0	0	0	4
5N20W SE Quadrant	12	14	5	2	3	3	3	2	1	0	1
Surface Collection	16	9	3	6	0	0	6	0	0	0	0
5N15W NW Quadrant	14	10	1	4	3	0	0	2	0	1	0
5N15W NW Quadrant Wedge 1	3	6	1	0	2	1	0	3	1	0	0
10N15W SW Quadrant Section D Feature 2	8	4	1	0	2	3	0	0	0	0	0
10N15W Section B	2	0	1	0	1	2	2	1	1	0	0
25N10W Test Trench 1	0	3	1	1	2	0	1	0	0	0	1
10N15W Test Pit 1	1	3	2	0	1	0	0	0	1	0	0
5N15W NW Quadrant Wedge 2	1	0	0	4	0	0	1	0	0	0	0
5N15W Section 1 Feature 1	2	1	1	0	0	1	0	0	0	2	1
10N15W SE Quadrant	2	1	1	0	0	0	0	0	0	0	0
15N20W Section A	1	1	2	0	0	0	0	0	0	0	0
Surface Scrape 4	1	1	1	0	0	0	0	0	0	0	0
Surface Scrape 5	1	0	1	0	1	0	0	0	0	0	0
Surface Scrape 1	1	0	0	1	0	0	1	0	0	0	0
Surface Scrape 2	0	0	1	0	0	0	0	1	0	0	0
Surface Scrape 3	1	0	0	0	0	0	0	0	0	0	0
Probe 2	0	0	1	0	0	0	0	0	0	0	0
Probe 1	0	0	0	0	0	0	1	0	0	0	0
Total	703	516	236	206	105	104	81	69	60	47	44

Table 92 Continued. Distribution of tool class by unit.

Unit	Crescent	Piercing Tools	Denti-culate	Piece escallier	Biface	Serrated pieces	Varia	Backed Trunc-ation	Projectile Point	Knives	Uniface
10N20W SE Quadrant	10	6	5	8	3	1	4	8	2	3	0
10N15W SW Quadrant Section D	7	6	1	2	3	1	1	0	1	0	0
20N40W Test Trench 2	9	5	4	3	4	3	2	1	2	2	0
15N25W NE Quadrant	2	5	8	3	2	6	1	1	0	1	2
15N20W Section C	1	1	4	1	3	0	2	0	0	0	0
15N15W SW Quadrant	1	1	0	2	1	3	1	1	0	0	2
27N16E Test Pit 2	1	4	0	0	2	1	1	1	0	0	0
5N15W NW Quadrant Wedge 1	2	1	0	0	1	0	2	2	1	0	1
5N20W NE Quadrant	1	1	0	2	1	1	2	3	0	0	0
15N15W SE Quadrant	2	0	1	0	1	0	0	0	0	0	0
5N20W SE Quadrant	1	0	0	0	0	4	0	0	0	0	0
5N15W NW Quadrant	0	0	1	1	0	0	0	1	0	0	1
15N20W Section A	0	1	0	0	0	0	1	0	0	0	0
5N15W NE Quadrant Wedge 2	0	0	0	1	0	0	0	0	0	0	0
5N15W Section 1 Feature 1	0	0	0	0	1	0	0	0	0	0	0
10N15W Section B	0	0	1	0	0	0	0	0	0	0	0
Surface Scrape 5	0	0	0	1	0	0	0	0	0	0	0
Surface collection	0	0	0	0	1	0	0	0	0	0	0
10N15W Test Pit 1	0	0	0	0	0	0	1	0	0	0	0
Surface Scrape 1	0	0	0	0	0	0	1	0	0	0	0
Total	37	31	25	24	23	20	19	18	6	6	6

When the distribution of complete versus broken tools is examined, no units stand out as having comparatively higher or lower quantities (see Table 93). Overall there are fewer complete tools, with the number of broken nearly doubling complete. The breakdown by unit is consistent with this as complete tools make up around half of the total number of tools per unit.

Table 93 Distribution of complete and broken tools by unit.

Unit	Complete	Broken	Total
10N20W SE Quadrant	146	347	493
15N25W NE Quadrant	159	219	378
10N15W SW Quadrant Section D	132	199	331
20N40W Test Trench 2	119	172	291
15N20W Section C	89	148	237
5N20W NE Quadrant	43	81	124
15N15W SW Quadrant	36	57	93
27N16E Test Pit 2	42	48	90
15N15W SE Quadrant	15	38	53
5N20W SE Quadrant	24	27	51
30N01E Test Pit 3	17	32	49
Surface Collection	20	21	41
5N15W NW Quadrant	12	27	39
5N15W NW Quadrant Wedge 1	13	14	27
10N15W SW Quadrant	4	14	18
25N10W Test Trench 1	2	7	9
5N15W Section 1 Feature 1	3	6	9
10N15W Test Pit 1	2	7	9
10N15W Section B	2	9	11
5N15W NE Quadrant Wedge 2	1	6	7
Surface Scrape 5	1	3	4
Surface Scrape 1	2	2	4
15N20W Section A	3	3	6
10N15W SE Quadrant	1	3	4
Surface Scrape 4	0	3	3
Surface Scrape 2	2	0	2
Surface Scrape 3	0	1	1
Probe 1	0	1	1
Probe 2	0	1	1
Total	890	1496	2,386

6.3.4 Comparing the Distribution of Chipped Stone Populations

What does the distribution of the chipped stone assemblage tell about the site as a whole? As shown in Tables 83 above and 94 below the highest density units include the southeast quadrant of 10N20W, Test Trench 2 in unit 20N40W, Section D in the southwest quadrant of 10N15W, the northeast quadrant of unit 15N25W, and Section C in the northwest quadrant of 15N20W. The midden deposit includes the southeast quadrant of 10N20W, 10N15W Section D, and the northeast quadrant of 5N20W, and together they constitute 44.6% of the entire assemblage. The remaining high density units are Test Trench 2 in unit 20N40W, the northeast quadrant of unit 15N25W, and Section C in the northwest quadrant of 15N20W, all of which are in the upper field. While these units are generally among the largest with the most levels excavated, they also represent those units that demanded the most attention during excavations as they yielded the greatest number of artifacts and generally identified in situ deposits and complex cultural stratigraphy.

Table 94 Distribution of type percentages in the densest units, including the total assemblage, debris, debitage, cores and tools.

Unit	All	Debris	Debitage	Cores	Tools
10N20W SE Quadrant	21.7	17.0	25.3	18.7	20.7
20N40W Test Trench 2	15.1	13.7	16.2	16.0	12.2
10N15W SW Quadrant Section D	11.5	14.5	9.1	13.8	13.9
5N20W NE Quadrant	11.4	11.6	7.0	6.0	5.2
15N25W NE Quadrant	9.7	7.5	10.5	20.5	15.8
15N20W Section C	8.4	11.9	5.8	6.7	9.9

When the distribution is looked at by unit, chips (debris) and/or tertiary flakes (debitage) dominate in almost all units regardless of unit location or size. In the few units in which chips or tertiary flakes are not the majority, chunks or tertiary blades are the most occurring types. Only two units appear contrary to the overall trend. While the surface collection has a strong tool showing, this is an obvious distortion based on researcher bias during collection. Feature 2, within Section D in the southwest quadrant of 10N15W was also dominated by tools. Feature 2 represents a concentrated cache deposit (n=34) at the base of Feature 1. The deposit measured ~20cm by 15cm. The cache is made up of 45.9% tools, 26.5% blade debitage, and 23.5% flake debitage. Overall blade blanks constitute 55.9% of the Feature 2 cache. Neither the surface collection nor the cache can be considered typical of the greater assemblage, although all other units on some scale do largely appear to be somewhat representative.

6.3.5 Distribution within the Feature 1 Midden

As the midden adjacent to Feature 1 represents a very significant deposit, the contents have the potential to reveal a great deal about the chipped stone assemblage as well as the feature. Does the midden deposit adjacent to the Feature 1 platform differ from less secure deposits? As previously discussed, Feature 1 is considered the most significant feature and architectural phenomenon excavated thus far.
During excavations the southeast quadrant of unit 10N20W was preliminarily identified as a possible midden as it seemed to contain very large quantities of chipped stone and faunal remains, and was closely associated with Feature 1, located at the northwest corner of the platform. This unit is in fact the most dense overall and was among the highest densities for each population distribution and has therefore maintained its designation as a highly concentrated midden deposit, where chipped stone (as well as faunal material) was intentionally discarded. The southwest quadrant of 10N15 SW QUAD includes part of Feature 1 and borders the midden in the southeast quadrant of unit 10N20W to the east. Because of the location of the southwest quadrant of unit 10N15W, adjacent to the primary midden deposit, and the consistent high densities for all chipped stone populations, it is logical to designate this unit as a continuation of the midden. The northeast quadrant of 5N20W due west of, and is halved by Feature 1. The midden can be distinguished from the rest of the assemblage based on the high density of artifacts.

While the stone platform represents the most significant feature, its function is unknown. An important question asks if the surrounding deposits offer any clues that might inform interpretations related to the function of Feature 1? Despite the significance of the midden (bordering the platform to the (north and west) and its relationship to Feature 1, when the contents are considered independently this deposit does not stand out from other units. Concentrations within the midden deposit were not indicative of any one task or even concentrated knapping efforts occurring on the platform. While the deposits surrounding the midden were the densest they can be considered to be representative of the greater assemblage. Feature 2, the blade cache, located at the base of the platform wall to the represents a secure deposit. Although there is a clear relationship between the placement of the cache in relation to the platform, the nature of the relationship is unclear. Of the 34 pieces of chipped stone in the cache, 17 are tools. Among the tools, 64.7% are retouched blades, with 29.4% identified as retouched flakes, and 1 burin or 5.9%. When examined as a whole, 67.6% of the pieces were complete, and none were found to be burned. The blade debitage averages 67.8mm in length, 27.4mm in width and 7.7mm in thickness. The blade tools average 74.3mm in length, 30.3mm in width, and 8.3mm in thickness. The blade debitage for the assemblage as a whole averages 51.8mm in length, 19.5mm in width, and 6.6mm in thickness. The measurements for the blade tools from the entire site average 62.7mm in length, 24.9mm in width, and 8.1mm in thickness. The blades cached at the base of Feature 1, while not significant in terms of tool class or function, is dominated by large, fine blades that are uncharacteristic of the site. Although the cache does not provide enough data for a solid interpretation or aid in the identification of the possible use(s) of the Feature 1 platform, it does suggest the significance of the structure as a place to which to return.

6.3.6 Specialized Activity Areas?

The midden, as discussed above, was recognized as a densely concentrated deposit, and Feature 2 was identified as an intentional cache of considerable importance, but were other heavily utilized or specialized activity areas identified elsewhere? While the units discussed here informed interpretations related to core reduction, tool production, tool use, and discard patterns, among other things, they did not allow task specific areas to be identified. Differential distribution by unit and type/class was not at all evident, except possibly in the case of cores. As the tools in general and tool classes in particular were found to be largely unspectacular in their distribution, with the majority found in the midden deposit, specialized task or activity areas were not identifiable. Although this distribution analysis was unable to document specialized activity areas, future chipped stone analyses will allow for a better understanding of chipped stone related activities and specialized areas. Following the completion of excavations, laboratory analysis and processing, the complete data set of the full assemblage can be more fully examined in terms of distribution and will undoubtedly reveal more specific patterns of distribution. Other analyses including that of the faunal remains and other cultural materials recovered will also contribute to distribution studies, as well as interpretations of specialized activity areas, and use of Feature 1.

Obviously some areas of the site appear to have been more heavily utilized than others. Outside of the midden deposit, other comparatively high concentration units were identified. Numerous units in the upper field were found to contain significant deposits. As discussed, Test Trench 2 in unit 20N40W, the northeast quadrant of unit 15N25W, and Section C in the northwest quadrant of 15N20W are all among the highest density units, but were not as concentrated in chipped stone and bone as the midden deposit, and, like the midden have a broad and regular showing of chipped stone type distribution. The units with the highest distribution are all primary excavation units that are contextually considered to contain in situ materials, appearing to be "undisturbed" other than by basic site formation processes. The test and excavation units and surface scrapes in the lower field that are considered severely or moderately disturbed due to their location within and on the periphery of a plow zone/modern agricultural field show no specific trends indicative of a disturbed, contaminated assemblage resulting from modern agricultural activity.

The lack of in situ and/or high density deposits as well as the less than expected debris in the lower field, compared to the incredibly dense and in situ deposits around Feature 1 on the terrace at the south end of the lower field and the deposits in the upper field, indicates that the terracing that is known to have removed a small portion of Feature 1 probably removed the original deposits from this area. While Test Trench 1 in the lower field was excavated to a depth of 2.72m without reaching bedrock (although with sparse cultural materials), bedrock was found within the top 35cm in the southeast quadrant of 10N15W, and havara-like material was exposed in the southeast quadrant of 15N15W within the top 25cm. Feature 1 sits within the terrace above the lower field and had mostly escaped artificial terracing and bulldozing.

6.3.7 Summary of Results and Interpretations

The contextual study of distribution can reveal a great deal about economic patterns and how the site was used. Economy and site use are largely defined by how the chipped stone, in this case, is distributed throughout the site. A primary question related to the chipped stone asks what the tool, debitage, debris and core populations tell about economy and site use based on distribution. To reiterate, the debris had its greatest concentration in the southeast quadrant of 10N20W, the primary midden unit, with 17.0%. When combined the midden contains 43.1% of debris. The remaining high concentration units are in the upper field and total 33.1%. While chips outnumber chunks they both share a broad distribution. The regular distribution of debris indicates that plowing probably did not have a significant impact on the creation of debris at *Ais Yiorkis*. The amount of debris within the midden deposit suggests that it was produced through knapping and deposited in the midden intentionally following core reduction and/or tool production. The highest density unit for debitage was also the primary midden unit with an even higher concentration at 25.3%. The suite of midden units contain 46.1% of the debitage, and 32.5% was recovered from the upper field. When the debitage is examined by blank type, the distribution of blanks correlates to the overall distribution of debitage with no notable concentrations of particular types.

The core population differs in that the unit with the highest distribution, the northeast quadrant of 15N25W, at 20.5%, is in the upper field. Until a future examination occurs looking at the more recent excavations that focused on expanding this unit and the chipped stone recovered there from, the greater concentration of cores in this unit is unexplained. The midden deposits still contain 38.5% of the cores, but the majority was recovered from the upper field, with 43.2%. When examined by type, the cores show no distinctive distribution with the most occurring types in higher concentrations in the overall densest units. Like the debris and debitage, the greatest concentration of tools, 20.7%, was recovered from the primary midden unit. Overall the midden deposits contained 39.8% of the tools. When combined, the high concentration units in the upper field constitute 37.9% of the tools. The analysis of tools by class revealed that most classes are widely distributed, based generally on the overall distribution. The higher the quantity of a specific tool class the greater its distribution.

Quantities for the surface collection, surface scrapes, test pits and probes are predictably low as they are typically smaller, and are generally in the most disturbed areas of the site and have very little to no depth. These units are typically small and/or and shallow, and as previously mentioned many are within known modern plow zones. The chipped stone recovered from these units was expected to be represented by large quantities of highly fragmentary debris. Interestingly, the units within the plow zone do not differ in any significant way from other more secure deposits. When comparing the broken to the complete tools the assumption is that the broken tools should be found in high quantities within the plow zone units as they have been exposed to mechanical processes. High percentages of broken tools were also expected within the midden units as they are likely to have been intentionally discarded. While broken tools were in fact generally found in higher densities within the plow zone and midden unit(s) this distribution is based on sheer numbers as broken pieces outnumber complete as an overall trend for the assemblage. The distribution of broken and complete match the overall trend for the site and these units can not be differentiated from other units. A s a general rule it seems that despite the presence of a concentrated midden, all of the chipped stone populations are relatively equally distributed throughout the site. Economic patterns related to the use and management of the chipped stone assemblage does not appear to adhere to strict rules that correlate production to site use.

6.3.8 Contemporaneity in Distribution

As many Aceramic Neolithic sites in Cyprus have multiple components representing different occupations and/or time periods, the examination of issues of intra-site contemporaneity at *Ais Yiorkis* is very important. Do the chipped stone recovered from *Ais Yiorkis* represent a single contemporaneous assemblage? As discussed in depth above, the distribution of the chipped stone assemblage follows the same pattern across populations, with debris, debitage, cores and tools distributed in much the same manner throughout all of the units. The consistency indicated through this analysis appears to indicate that the chipped stone recovered from *Ais Yiorkis* represents a single, undifferentiated assemblage. This analysis has established intra-site contemporaneity within the chipped stone assemblage, and has identified a regular distribution pattern across the site of *Ais Yiorkis*.

The units with the highest amount of debris closely correspond to the units that have the highest densities overall. Overall quantities often correspond with specific populations, therefore the relationship between the distribution of the overall assemblage and the debris is not surprising. An examination of the cores reveals that their distribution also reflects the same general pattern as the overall assemblage. While the same primary units reflect the highest densities, there is variation in the actual distribution of cores between these units. The distribution of cores by type generally correlates with higher densities of each type occurring in the higher density units in general.

In examining debitage blank types and their distribution throughout the site the highest percentages for each blank type were found to correspond to the debitage totals and to the overall assemblage. The flake blanks (primary, secondary and tertiary) and the blade blanks (primary, secondary and tertiary) are distributed throughout the units in a regular pattern that is typical of their overall occurrence. Bladelets follow the same general pattern, occurring in their greatest quantities in the units with the highest densities. Overall, this consideration of the debitage distribution has shown that despite the presence of a large midden, all types of debitage are relatively equally distributed throughout the site. Like the debris, cores and debitage, an examination of the tool assemblage reveals that the distribution is largely the same as the overall assemblage.

The uniformity in the *Ais Yiorkis* assemblage can be interpreted in one of two ways. The first suggests that the range of radiocarbon dates recovered from *Ais Yiorkis*, including those spanning earlier and later than the majority (which were Middle-CPPNB) are unsound. The second proposes that the radiocarbon dates are valid and that the apparent regularity in the assemblage actually represents the same people creating and using the same artifacts during repeated occupations at the site over a long period of time. At this time it is difficult to favor one interpretation over the other. More detailed analyses will be conducted in the future that will look at the larger assemblage recovered from the subsequent seasons to look even more closely at distribution. Ideally additional radiocarbon dates will be available for evaluation in relation to the chipped stone.

6.4 Inter-site Comparison

Placing and contextualizing *Ais Yiorkis* within the early Aceramic Neolithic of Cyprus by exploring how trends in chipped stone production and use relate to other assemblages and their chronology is very important. The most obvious and reliable method for placing a site chronologically is through the collection and testing of materials that yield solid radiocarbon dates. Not all sites contain datable materials, such as charcoal, and/or the calculated range may be broad and non-specific, therefore dates should be correlated with other useful relative chronologically defined characteristics, including artifact assemblages and other data. It is proposed that chipped stone assemblages on Cyprus, a relatively geographically isolated population, can be used to aid in the placement of sites within the Cypriot complex. The various forms of data collected from and related to *Ais Yiorkis*, including geographic location, architecture, fauna, and flora will be superficially compared with those of other assemblages in an attempt to further contextualize *Ais Yiorkis*. As will be discussed below, these data, while useful and informative in their own right, do not strongly correlate to chronology. In contrast, the data collected via chipped stone analysis can be compared to other, contextually and chronologically secure data sets.

6.4.1 Inter-site Comparison within the Cypriot Pre-Pottery Neolithic

In terms of radiocarbon dating the samples recovered from *Ais Yiorkis* (n=16) revealed a span ranging from 7,960 to 5,660 cal BC (with a few exceptions), which as discussed in Chapter 3, includes the Middle and Late Cypro-PPNB as well as the Khirokitia Culture period. The majority (n=8 or 50%) of the radiocarbon dates fall within the Middle Cypro-PPNB (see Table 3). Only two date the Late Cypro-PPNB, four to the KC, and the others have been dismissed as insecure or have been invalidated. Despite the broad time frame seen in the formal radiocarbon dates, this analysis of the chipped stone has proven that the assemblage from *Ais Yiorkis* is (thus far) consistent. The dates therefore indicate one of two things, either some dates are distorted or the same population reoccupied the site over hundreds of years employing the same technological flintknapping skills and choices.

The geographic locations of the documented Akrotiri phase sites of Akrotiri *Aetokremnos* and possibly Nissi Beach and Aspros, the Cypro-PPNB sites of Parekklisha *Shillourokambos,* Kissonerga *Mylouthkia,* Kalavasos *Tenta*, Akanthou *Arkosyko*, and Ayia Varvara *Asprokremnos,* and the KC sites Khirokitia *Vouni*, Kholetria *Ortos*, Cape Andreas *Kastros,* and again Kalavasos *Tenta* can be generally compared to that of *Ais Yiorkis*. The examination of geography or site location allows for the identification of possible trends in intentional habitat selection. Akrotiri *Aetokremnos*, Nissi Beach, Aspros, Parekklisha *Shillourokambos*, Kissonerga *Mylouthkia,* Akanthou *Arkosyko,* Khirokitia *Vouni*, Cape Andreas *Kastros,* Kalavasos *Tenta,* and Kholetria *Ortos* are all coastal sites or are within a few kilometers of the coast.

Along with *Ais Yiorkis*, only Ayia Varvara *Asprokremnos* is considered to represent an inland site. Although dates have not yet been recovered from *Asprokremnos*, it has been identified as a CPPNA site based on cultural remains, including and especially chipped stone which closely parallels mainland PPNA assemblages (McCartney et al. 2006, 2007). A number of other sites were newly documented along with *Asprokremnos* that may also represent early inland sites (McCartney et al. 2007). While geographic location was obviously an important factor in site selection for Neolithic Cypriots, it was likely more varied than the coastal trend outlined above suggests. In general it can be assumed that the relative lack of inland/upland sites relates more to researcher bias than to Neolithic bias.

For the most part, the types of faunal remains recovered from *Ais Yiorkis* do not stand out in the Cypriot Aceramic Neolithic, as they include the typical suite of sheep/goat, fallow deer and pig. What does stand out among the faunal assemblage, however, is the presence of cattle. While cattle remains have been documented at *Shillourokambos* the corresponding sequences related to these samples have been radiocarbon dated to the Early Cypro-PPNB (Vigne 2001). Cattle remains were also found at *Akanthou* and although the context was not confirmed with radiocarbon dates, the chronological placement of the site within the ECPPNB suggests the presence of cattle is not unreasonable (Sevketoglu 2000). Thus far, the Early CPPNB has not been documented via radiocarbon dating at *Ais Yiorkis*, and cattle remains have not been documented from Middle, Late or KC deposits at any other site. While faunal remains generally provide great insight, the remains recovered from *Ais Yiorkis* seem to incite greater questions related to subsistence economy and chronology.

The botanical remains recovered from *Ais Yiorkis* have been studied and summarized from the samples recovered during the 2005 season (Espinda 2007). While the intra-site distribution of the botanical assemblage is contextually different from the chipped stone under study in this analysis, the interpretations appear to apply to the *Ais Yiorkis* complex as a whole, as the site represents a single assemblage. As in many other ways, *Ais Yiorkis* stands out as an anomaly among the other Aceramic Neolithic sites in terms of the botanical remains. While Espinda (2007) identified the typical suite of domestic plants, including einkorn wheat, emmer wheat, and barley, a much higher percentage of einkorn wheat (91.2% of the assemblage) was documented at *Ais Yiorkis* than at any other Aceramic Neolithic site. While sampling biases or a lack of samples from other sites may play a role in this discrepancy the propensity of einkorn wheat at *Ais Yiorkis* is still significant. Espinda's interpretation of the botanical data concluded that the domesticated plants identified at *Ais Yiorkis* may have been imported to the site as opposed to being grown and harvested on-site. The botanical data were interpreted by Espinda as suggestive of "a major dichotomy between the early coastal sites and *Ais Yiorkis*, with *Ais Yiorkis* suggesting a different economic strategy and possibly a different site function" (Espinda 2007: 123).

6.4.2 Inter-site Comparison between *Ais Yiorkis* and Kalavasos *Tenta*.

This portion of the present analysis intends to place *Ais Yiorkis* within the Aceramic Neolithic. The questions addressed here focus on inter-site comparison based on the chipped stone analyses and interpretations discussed thus far. It is suggested here that a comparison between the *Ais Yiorkis* chipped stone assemblage and the sound and secure multi-period assemblage recovered from Kalavasos *Tenta* will further contextualize and narrow down the chronology, relating the inhabitants of *Ais Yiorkis* to the greater Aceramic Neolithic of Cyprus.

In terms of chipped stone assemblages in Cyprus, useful comparative samples are extremely limited. Reasons for this include a lack of consistent typology among analysts (which is true almost everywhere), as well as a lack of published chipped stone analyses detailing qualitative and quantitative attributes of full assemblages. Differences in terminology and inter-person analysis differences pose the most difficult problems when comparing samples between researchers/analysts. In general, the work done by Carole McCartney has pushed chipped stone research in Cyprus a long way by raising the visibility of the assemblages. McCartney has published the most comprehensive works, detailing specific assemblages (e.g., McCartney and Todd 2005, McCartney and Gratuze 2002). Her analysis of the chipped stone assemblage recovered from Kalavasos *Tenta* provides the most valuable data set for comparison with *Ais Yiorkis* in terms of both availability and chronology. The *Tenta* findings have been fully published and the assemblage has been identified as spanning five periods of Aceramic Neolithic occupation (McCartney and Todd 2005). McCartney and I spent a significant amount of time conducting analyses together, comparing terms and techniques and are confident that we were able to minimize inter-person bias.

While McCartney and Todd (2005) identified a number of periods of occupation at *Tenta*, only the secure deposits for Aceramic Neolithic Periods 5, 5/4, Early 4, 3, 2 and 1 are examined in this analysis. As discussed in Chapter 2, *Tenta* Period 5 represents an Early CPPNB assemblage or Early Cypriot Aceramic. The Early CPPNB is known to range from the earliest recorded Aceramic Neolithic date of 8200 cal. BC through 8000 cal. BC. The Middle CPPNB is thought to span from 8000 to 7500 BC and is relatively unknown. *Tenta* Early Period 4 may represent this Middle period, and *Tenta* Period 5/4, is considered a mixed deposit of Period 5 and Period 4 assemblages. The bulk of the radiocarbon dates from *Ais Yiorkis* also fall within this time span (Simmons 2004, 2005, Simmons and O'Horo 2003). The Late CPPNB or Middle Cypriot Aceramic, which lasts from 7500 to 7000 cal. BC, includes *Tenta* periods 4 through 2. *Tenta* period 1 corresponds to the KC Period or Late Cypriot Aceramic, dating from 7000 to 6500 cal. BC (Todd 2005, McCartney and Todd 2005, Peltenburg et al. 2000).

The dating of *Ais Yiorkis* to the Middle-CPPNB facilitates a comparison to like Middle deposits from *Tenta*. Unfortunately this time period is not well represented at the latter site. By comparing *Ais Yiorkis* to the entire Aceramic Neolithic of *Tenta*, the chronology for both *Ais Yiorkis* and *Tenta* can be examined and trends over time can be recognized, and the dates secured. A number of specific attributes, types and measurements are compared here to further contextualize *Ais Yiorkis* within the bigger picture.

6.4.2.1 Raw Material Comparison

Comparing raw material utilization between *Ais Yiorkis* and *Tenta* is a useful exercise, as differences were identified between periods during the inter-site analysis of *Tenta.* Basic differences in the raw material types utilized between *Ais Yiorkis* and *Tenta* can be attributed to geography and geology in terms of availability. Among the samples recorded from *Ais Yiorkis,* Lefkara dense translucent has not been recorded and has not been identified geologically as a locally available material. At *Tenta,* Lefkara translucent was found to dominate the assemblage overall (McCartney and Todd 2005). Lefkara translucent has also been noted as primary among the (geographically close in proximity to *Tenta*) Khirokitia assemblage (Astruc 2003). Lefkara dense translucent was documented in greater quantities in the later periods. The quantities of Lefkara basal and Lefkara translucent material types are notable in *Tenta* Period 5 (McCartney and Todd 2005).

The raw material types are compared between *Ais Yiorkis* and *Tenta* for both debitage and tools. What is identified as the "blank sample" within the *Tenta* assemblage is comparable to the debitage sample from *Ais Yiorkis.* The sample analyzed for material type from *Ais Yiorkis* numbers 4,102 pieces, representing a much larger sample than that recovered from *Tenta* (n=449 for all periods). No samples were collected for *Tenta* periods 5/4 and 3 and all of the samples from *Tenta* that were identified as contaminated or unknown deposits were omitted from this comparative analysis.

When the debitage is examined, the presence of Lefkara dense translucent within the *Tenta* sample somewhat disrupts the ability to compare the samples directly. Lefkara basal, the dominant material type at 77.5% of the sample used in the production of debitage at *Ais Yiorkis* was also available and used at *Tenta*. Despite the availability and high quality of Lefkara basal at *Tenta*, it was not the most used material type. Lefkara basal was documented in its highest quantities among the *Tenta* debitage in Early Period 4, with 35.2%. *Tenta* Periods 1, 2, 4 and 5 are dominated by Lefkara translucent, which comprises only 13.5% of the *Ais Yiorkis* sample. Translucent represents just 8.2% of the *Ais Yiorkis* debitage sample which is more comparable to the percentages from *Tenta* overall, especially Periods 5 and 1. Only in *Tenta* Period 5 were "other" raw materials recorded at 1.4%, compared to 0.8% at *Ais Yiorkis* (see Table 95).

Table 95 Raw material utilization among the debitage sample from *Ais Yiorkis* compared to secure *Tenta* deposits. Adapted from tables 27, 28, 29, McCartney and Todd 2005.

	Ais Yiorkis		Period 5	Early Period 4	Period 4	Period 2	Period 1
n=	4,097		74	105	54	89	27
	n	%	%	%	%	%	%
Translucent	335	8.2	10.8	19.1	13.0	4.8	7.4
Lefkara translucent	555	13.5	51.4	35.2	59.3	52.4	44.4
Lefkara dense translucent	0	0.0	20.3	10.5	11.1	24.9	37.0
Lefkara basal	3,175	77.5	16.2	35.2	16.7	18.0	11.1
Other	32	0.8	1.4	0.0	0.0	0.0	0.0
Total	4,097	100	100	100	100	100	100

Raw material utilization was also compared between the tool samples from *Ais Yiorkis* and *Tenta*. Again, contaminated samples or those from unknown deposits were not considered here, and *Tenta* Period 5/4 was omitted due to its small sample size (n=2). At *Ais Yiorkis* various raw materials were knapped during blank production, although Lefkara basal dominates with 77.5%. Interestingly, the selection of materials for tool use limits the amount of other materials and further privileges Lefkara basal, upping its employment to 89.5% (a 12% increase). Among the *Tenta* tool populations, Period 5 has the highest utilization of Lefkara basal with 29.0% of the assemblage, which is still comparatively low. Period 5 also shows a similar percentage hike between debitage and tools for Lefkara basal. Interestingly, Lefkara basal occurred in greater quantities among the debitage from Early Period 4 with 35.2% compared to 10.3% of the tools from the same period among the tools revealing a trend opposite of *Ais Yiorkis* and Periods 4 and 3 (a 0.5% increase). Periods 1 and 2 also have lower quantities of Lefkara basal among the tools. Overall, as among the debitage, Lefkara translucent dominates tool production in all *Tenta* periods. "Other" materials were rarely used in tool production at *Ais Yiorkis* as in most *Tenta* periods, with *Ais Yiorkis* at 0.4% most similar to Periods 4 and 5 in which no "other" materials were utilized (see Table 96).

Table 96 Raw material utilization among the tool sample from *Ais Yiorkis* compared to secure *Tenta* deposits. Adapted from Tables 27, 28, 29, McCartney and Todd 2005.

	Ais Yiorkis		Period 5	Early Period 4	Period 4	Period 3	Period 2	Period 1
n=	1,201		31	58	29	42	207	58
	n	%	%	%	%	%	%	%
Translucent	46	3.8	29.0	8.6	6.9	7.1	7.7	5.2
Lefkara translucent	75	6.2	35.5	53.5	48.3	40.5	49.8	41.4
Lefkara dense translucent	0	0.0	6.5	27.6	20.7	28.6	25.1	44.8
Lefkara basal	1,075	89.5	29.0	10.3	17.2	21.4	16.4	5.2
Other	5	0.4	0.0	0.0	6.9	2.4	1.0	3.5
Total	1,201	100	100	100	100	100	100	100

Obsidian was not included among the material type percentages for either the debitage/blank sample or the tools from *Tenta*, but one piece was recorded from Period 5 and three were in Early Period 4 contexts. As previously mentioned, obsidian has been recorded in small numbers among the *Ais Yiorkis* assemblage, totaling 16 pieces up to 2004. The presence of obsidian in Neolithic Cyprus is known to increase at earlier sites and decrease at later sites.

To summarize, the prevalence of Lefkara basal as the dominant raw material type at *Ais Yiorkis* is notable when compared to *Tenta* deposits. Although *Tenta* contains

Lefkara basal, the occurrence of Lefkara dense translucent may have distorted this comparison, as it is not present at *Ais Yiorkis*, and dominates the raw material usage at *Tenta.* The very high incidence of Lefkara basal among the *Ais Yiorkis* debitage (77.5%) is most comparable to rates in Early Period 4 (35.2%). The amount of translucent debitage at *Ais Yiorkis* (8.2%) appears most comparable to Periods 5 and 1, and the presence of "other" raw materials among the debitage as seen at *Ais Yiorkis* has only been documented in *Tenta* Period 5. The occurrence of Lefkara basal increases among the *Ais Yiorkis* tools (89.5%), and is most comparable to *Tenta* Period 5 (29.0%), which shows a similar increase between debitage and tools for Lefkara basal. "Other" materials were rarely used in tool production at *Ais Yiorkis,* and can be considered most comparable to Periods 4 and 5. Obsidian, which occurs in very small numbers at *Ais Yiorkis,* can be correlated to *Tenta* Period 5 and Early Period 4.

6.4.2.2 Blank Type Comparison

In order to compare *Tenta* to *Ais Yiorkis* in terms of blank types for debitage and tools a restricted analysis was performed. Only the occurrence of flakes and blades were tallied for this comparison. As types represent the majority of blanks, the omission of a number of blank types from the *Ais Yiorkis* debitage for this analysis does not affect these interpretations. In order to compare the *Ais Yiorkis* blade and flake blanks to the numbers reported from *Tenta*, only the complete pieces were considered.

There appear to be an unusually high number of blade blanks represented among the *Ais Yiorkis* debitage with just 2.88 flakes to every 1 blade, and 1.44 blades to every 1 flake when only the complete pieces are considered. Among the complete *Ais Yiorkis* debitage flakes constitute 40.9% compared to 59.1% blades. This ratio of complete flakes to blades most closely corresponds to the numbers reported for *Tenta* Period 5/4, which is made up of 70% flakes opposed to 30% blades (See Table 97). While the *Ais Yiorkis* rates of complete flakes and blades most resembles *Tenta* 5/4 the differences are still very pointed, with blades outnumbering flakes at *Ais Yiorkis* and the percentage of flakes among *Tenta* 5/4 still 30% higher than the *Ais Yiorkis* sample. This comparison appears to suggest that *Ais Yiorkis* is more different than similar.

Table 97 Debitage blank type sample comparing *Ais Yiorkis* to *Tenta* periods. Adapted from Tables 31, 32, 33 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Period 5/4	Early Period 4	Period 4	Period 3	Period 2	Period 1
n=	8,523	594	277	714	673	393	1,787	1,114
	%	%	%	%	%	%	%	%
Flakes	40.9	90.3	70.0	90.6	88.3	84.2	84.0	80.0
Blades	59.1	9.7	30.0	9.4	11.7	15.8	16.0	20.0
Total	100	100	100	100	100	100	100	100

When the tool blank types, flakes and blades are compared to the samples from *Tenta,* it seems that the *Tenta* sample shifts significantly with blade blanks outnumbering flake blanks in all periods. Period 5 represents the most similar assemblage to *Ais Yiorkis,* with the lowest margin between flakes and blades (see Table 98). The *Ais Yiorkis* tool blank sample is made up of 46.8% flakes to 53.2% compared to 50.0% blades 50.0% in Period 5. The blade to flake ratios seen between *Ais Yiorkis* and *Tenta* debitage versus tool assemblages suggest differential trends in production and use. The more comparable production of 59.1% blade blanks with 53.2% used as tools indicates that production matched demand, especially when compared to *Tenta* Period 5, in which blade debitage made up just 9.7% versus 50.0% of tools.

Table 98 Tool blank sample comparing *Ais Yiorkis* to *Tenta* periods. Adapted from tables 31, 32, 33 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Period 5/4	Early Period 4	Period 4	Period 3	Period 2	Period 1
n=	2,222	128	60	186	148	179	658	376
	%	%	%	%	%	%	%	%
Flakes	46.8	50.0	31.7	42.5	37.2	38.5	35.9	35.4
Blades	53.2	50.0	68.3	57.5	62.8	61.6	64.1	64.6
Total	100	100	100	100	100	100	100	100

6.4.2.3 Platform Comparison

Platform types on blanks for both debitage and tools can be compared between *Ais Yiorkis* and *Tenta*. In terms of analysis and typology, platform types are largely comparable with only minor differences in terminology. The platform type that is termed compression in the *Tenta* analysis is known as crushed in this analysis. *Tenta*'s cortex platform is named cortical here, plain is single, and facetted is multiple. Insufficient data were available for debitage platforms from *Tenta* periods 5/4, 4 and 3 therefore they were not included in McCartney's or this analysis. Single platforms are the dominant type among the *Ais Yiorkis* debitage, which has the lowest percentage of single platforms among all of the assemblages, although Period 5 has the next least.

The number of crushed platforms documented at *Ais Yiorkis* (22.3%) far exceeds the numbers recorded for any of the *Tenta* period assemblages. While it appears, based on the *Tenta* chronology that crushed platforms decrease in later periods, the significant discrepancy between the *Ais Yiorkis* and *Tenta* percentages is too great to relate to chronology alone. The propensity of crushed platforms among the debitage at *Ais Yiorkis* probably reflects core reduction technology and hard hammer percussion, knapping skills, or may even correlate with raw material types (which is not investigated here). The occurrence of dihedral platforms also stands out among the *Ais Yiorkis* assemblage and appears to most resemble the numbers presented for *Tenta* Period 1 (see Table 99). Overall the comparison between the platforms on debitage did not successfully relate trends at *Ais Yiorkis* to any of the *Tenta* assemblages, as it does not represent the same trends seen for any single period.

Table 99 Comparison of platform types on debitage between *Ais Yiorkis* and *Tenta* periods. Adapted from tables 51, 53, 55 in McCartney and Todd 2005.

Type	*Ais Yiorkis*	Period 5	Early Period 4	Period 2	Period 1
n=	4,335	74	105	191	27
	%	%	%	%	%
Punctiform	4.9	0.0	0.0	0.0	0.0
Single	47.2	58.1	67.6	58.6	59.3
Multiple	6.7	32.4	24.8	27.8	22.2
Dihedral	14.0	1.4	1.0	4.7	11.1
Cortical	4.9	2.7	3.8	7.3	7.4
Crushed	22.3	5.4	2.9	1.6	0.0
Total	100	100	100	100	100

The tool platform types are also dominated by single platforms, with 46.4%, which most closely resembles Early Period 4 with 46.2%. Tool platforms follow the same trend as the debitage with high quantities of crushed platforms at *Ais Yiorkis*, although very few among the *Tenta* periods at large. Dihedral platforms among *Ais Yiorkis* tools are more similar to the percentage recorded for *Tenta* Period 4, while cortical are more similar to Period 3 (see Table 100). Again, the tool platform types recorded from *Ais Yiorkis* were not found to be comparable to the *Tenta* assemblages in general. Again, the differences in the types of platforms displayed on debitage and tools between *Ais Yiorkis* and the *Tenta* assemblages seem to distinguish *Ais Yiorkis* as distinctive.

Table 100 Comparison of platform types on tool between *Ais Yiorkis* and *Tenta* periods. Adapted from tables 51, 53, 55 in McCartney and Todd 2005.

Type	*Ais Yiorkis*	Period 5	Early Period 4	Period 4	Period 3	Period 2	Period 1
n=	1225	11	33	13	21	139	34
	%	%	%	%	%	%	%
Punctiform	4.0	0.0	0.0	0.00	0.0	0.0	0.0
Single	46.4	72.7	54.6	46.2	71.4	57.6	61.8
Multiple	6.4	18.2	36.4	46.2	19.1	32.4	32.4
Dihedral	7.3	0.0	0.0	7.7	0.0	2.2	0.0
Cortical	4.0	9.1	3.0	0.0	4.8	7.9	5.9
Crushed	31.9	0.0	6.1	0.0	4.8	0.0	0.0
Total	100	100	100	100	100	100	100

6.4.2.4 Quantitative Measurements Comparison

Quantitative measurements looking at average lengths, widths and thicknesses of blade and flake debitage and blade and flake tools are available from various *Tenta* periods for comparison. McCartney's measurements were reported in centimeters, but were converted here to millimeters for comparison to the *Ais Yiorkis* assemblage. No blade or flake debitage data was obtained for *Tenta* Periods 5/4, 4, 3 or 3/2. In terms of average length, the blade debitage (51.7mm) is most similar to the assemblage recovered from Early Period 4 (56.1mm) (see Table 101). *Ais Yiorkis* and Early Period 4 are most comparable in average length, width and thickness for blade debitage, although the Early Period 4 averages are still slightly larger. Notably, when the average length and width for blade debitage are examined, the dimensions for *Tenta* Periods 1, Early 4 and especially Period 2 approach flake proportions, with width nearly half length.

Table 101 Comparison of length, width and thickness of blade debitage between *Ais Yiorkis* and *Tenta*. Adapted from tables 60, 62, 64 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Early Period 4	Period 2	Period 1
n=	807	21	27	72	14
Length	51.7	60.3	56.1	58.4	58.2
Width	19.8	23.4	21.3	23.2	22.9
Thickness	6.5	10.0	8.0	9.0	9.3

The flake debitage from *Ais Yiorkis* reveals trend different than that of the blades, with the average flake length (29.3mm) most similar to Period 1, as it has the lowest average (35.9mm), although the *Ais Yiorkis* flakes are still quite a bit smaller (6.6mm on average). The largest average flake length is 38.7mm in *Tenta* Period 5, which is not much greater than Period 1. The average width (25.5mm) and thickness (6.3mm) of flake debitage from *Ais Yiorkis* are more comparable to Early Period 4 at 31.2mm and 8.4mm respectively (see Table 102). Overall differences in flake debitage size between *Tenta* and *Ais Yiorkis* are not dramatic and do not follow any particular trend over time.

Table 102 Comparison of length, width and thickness of flake debitage between *Ais Yiorkis* and *Tenta*. Adapted from tables 60, 62, 64 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Early Period 4	Period 2	Period 1
n=	3,408	46	60	80	11
Length	29.3	37.4	36.9	38.7	35.9
Width	25.5	32.7	31.2	32.0	39.9
Thickness	6.3	8.9	8.4	9.6	10.3

The quantitative measurements were also compared between *Ais Yiorkis* and *Tenta*. For the blade tool comparison (including all tools that were made from blade blanks), *Tenta* Period 5/4 was omitted due to insufficient sample size (n=1). An examination of the blade tools between assemblages reveals that the *Ais Yiorkis* assemblage very closely resembles length, width and thickness measurements for *Tenta* Early Period 4 (see Table 103). The blade tools overall show much more marked differences than the blade debitage, and following the trend noted earlier for *Ais Yiorkis*, in all *Tenta* periods tool blanks are larger in length, width and thickness than debitage blanks.

Table 103 Comparison of length, width and thickness of blade tools between *Ais Yiorkis* and *Tenta*. Adapted from tables 60, 62, 64 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Early Period 4	Period 4	Period 3	Period 3/2	Period 2	Period 1
n=	370	5	14	5	12	5	63	19
Length	62.7	85.9	77.2	69.6	77.1	119.4	72.2	74.2
Width	24.9	34.6	31.1	24.0	30.3	37.7	26.1	27.6
Thickness	8.1	17.2	12.2	9.9	12.6	1.5.3	10.9	9.9

The flake tools from *Ais Yiorkis* most resemble Period 2 in length and width, and Period 4 in thickness (see Table 104). A notable problem with this comparison overall is that among the flake tools from *Tenta* the sample sizes are very low, with Period 2 offering the only truly meaningful, but still quite small sample (n=36). Despite this, like

Ais Yiorkis, the trend in all periods is, like the blade pattern, for flake tools to be larger than flake debitage.

Table 104 Comparison of length, width and thickness in flake tools between *Ais Yiorkis* and *Tenta*. Adapted from tables 60, 62, 64 in McCartney and Todd 2005.

	Ais Yiorkis	Period 5	Early Period 4	Period 4	Period 3	Period 3/2	Period 2	Period 1
n=	477	5	11	2	6	2	36	11
Length	49.1	34.2	53.3	39.8	44.2	85.4	48.9	52.9
Width	37.6	31.1	36.8	29.5	29.6	60.9	39.4	43.2
Thickness	10.8	8.9	14.3	10.8	7.7	21.0	14.0	13.5

6.4.2.5 General Type Comparison

While the ways in which this and the *Tenta* analysis distributed the chipped stone though general types is dissimilar, a less direct comparison looking at how larger type ratios compare is useful (see Table 105). In order to create meaningful and comparable groups some combining and rearrangement was necessary. The tool category here includes tools, tool fragments and tool resharpenings which were split in the *Tenta* analysis. Splintered pieces were added to cores. What are designated as chips among the *Tenta* assemblages are microflakes here, and spalls are burin spalls. Unidentifiable blank fragments and debris from *Tenta* were lumped together as debris in this analysis.

Among all assemblages, debris is the most dominant type. The ratio of flakes to blades is most similar between *Ais Yiorkis* and *Tenta* Period 5/4. The ratio of blades to bladelets is most comparable between *Ais Yiorkis* (3.6:1) and Period 5/4 (3.6:1), with the exact same ratio, which is the highest ratio of blades to bladelets. When the cores are examined it is clear that *Ais Yiorkis* has a comparatively low core ratio, while Periods 1 and 2 have very high ratios. No *Tenta* period has a comparable flake to core, blade to core, or tool to core ratio. Of the debris to microflake ratios the most comparable are between *Ais Yiorkis* (6:1) and Period 5 (5.9:1).

Table 105 Comparison of chipped stone types between *Ais Yiorkis* and *Tenta*. Adapted from tables 23, 24 and 25 in McCartney and Todd 2005.

Category	*Ais Yiorkis*	Period 5	Period 5/4	Early Period 4	Period 4	Period 3	Period 2	Period 1
Debris	20,367	2,200	845	3,150	3,525	1,952	6,206	4,645
Flakes	16,868	536	194	647	597	331	1,501	892
Blades	5,851	58	83	67	76	62	286	222
Microflakes	3,382	375	55	368	487	273	715	485
Tools	2,386	204	87	312	343	279	990	612
Bladelets	1,643	56	23	52	44	29	111	63
Cores	449	64	24	76	87	47	244	158

6.4.2.6 Tool Type Comparison

Finally, tools classes were compared between *Ais Yiorkis* and *Tenta*. It was necessary to create a restricted table in order to look at the tools, as the *Ais Yiorkis* analysis includes a greater number of tool classes. The tools that were not identified as primary classes among the *Tenta* assemblage were generally removed from the *Ais Yiorkis* count. The perforators identified among the *Tenta* assemblage are termed piercing tools in this analysis, and the backed tools for *Ais Yiorkis* include tools that are backed and those that are backed and truncated. Retouched flakes and blades dominate all assemblages, but *Ais Yiorkis* has the highest rate. The percentage of retouched blades and flakes among the *Ais Yiorkis* assemblage, at 59.0% is most comparable to Periods 3 (55.6%) and 4 (54.3%), which have the highest rates among the *Tenta* assemblages. As previously discussed, scrapers are the most common tool class after retouched blades and flakes at *Ais Yiorkis*. Interestingly, the high rates of scrapers at *Ais Yiorkis* are unmatched in any other assemblage. The occurrence of notched tools appears relatively regular in all assemblages outside of Period 5 and Early Period 4, which have slightly higher rates. Other tool classes do not appear comparable to *Ais Yiorkis* (see Table 106). The lack of comparable data may be due to one of two factors. Either the removal of a number of tool classes from the *Ais Yiorkis* tally, as mentioned above, has distorted the *Ais Yiorkis* data, or the different rates between *Ais Yiorkis* and the *Tenta* periods indicates differential activities occurring at *Ais Yiorkis*. These trends should be further investigated via collaborative research and in depth statistics in the future.

Table 106 Tool classes by total and percentage for *Ais Yiorkis* and *Tenta* Periods 5, 5/4, Early Period 4 and 4. Adapted from tables 67, 68 and 69 in McCartney and Todd 2005.

	Ais Yiorkis		Period 5		Period 5/4		Early Period 4		Period 4	
Class	n	%	n	%	n	%	n	%	n	%
Retouched Blades/Flakes	1,219	59.0	91	50.6	35	45.5	119	48.0	120	54.3
Scrapers	236	11.4	2	1.1	1	1.3	4	1.6	6	2.7
Notches	206	10.0	27	15.0	9	11.7	39	15.7	19	8.6
Backed Pieces	122	5.9	4	2.2	8	10.4	19	7.7	11	5.0
Burins	81	3.9	9	5.0	2	2.6	9	3.6	10	4.5
Truncations	69	3.3	12	6.7	5	6.5	16	6.5	16	7.2
Glossed pieces	47	2.3	6	3.3	7	9.1	10	4.0	10	4.5
Piercing Tools	31	1.5	13	7.2	0	0.0	8	3.2	9	4.1
Denticulates	25	1.2	14	7.8	10	13.0	24	9.7	19	8.6
Pieces Escallier	24	1.2	0	0.0	0	0.0	0	0.0	1	0.5
Projectile Points	6	0.3	2	1.1	0	0.0	0	0.0	0	0.0
Total	2,066	100	180	100	77	100	248	100	221	100

	Period 3		Period 2		Period 1	
Class	n	%	%	n	%	n
Retouched Blades/Flakes	125	55.6	435	51.1	252	50.1
Scrapers	7	3.1	16	1.9	13	2.58
Notches	25	11.1	100	11.7	48	9.54
Backed Pieces	14	6.2	82	9.6	48	9.54
Burins	10	4.4	38	4.5	20	3.98
Truncations	16	7.1	48	5.6	45	8.95
Glossed pieces	11	4.9	57	6.7	29	5.77
Piercing Tools	5	2.2	17	2.0	17	3.38
Denticulates	11	4.9	56	6.6	30	5.96
Pieces Escallier	0	0.0	0	0.0	0	0.00
Projectile Points	1	0.4	3	0.4	1	0.20
Total	225	100	852	100	503	100

The presence of microliths as a distinctive tool class at *Ais Yiorkis* is significant as these tools relate *Ais Yiorkis* directly to *Tenta* Period 5. While as previously discussed, the microlithic tool class totals just 1.8% at *Ais Yiorkis* compared to 6.1% in Period 5. Period 5 has been identified as the only period that has a documented microlithic tool population. In the tool table McCartney does not distinguish microliths as their own tool class, but rather identifies them as a type within each class, which would have minimal effects on the overall totals. The rates of microliths among the *Ais Yiorkis* tool assemblage and their apparent relationship to earlier periods at *Tenta* would seem to correspond with other aspects of the assemblage discussed thus far.

6.4.2.7 Summary of Inter-site Comparison

The goal of this comparative analysis was to contextualize *Ais Yiorkis* within the Aceramic Neolithic of Cyprus through inter-site comparison with *Tenta* period deposits. Raw material usage, chipped stone types, blank types, tool classes, and lengths, widths and thicknesses have been compared between *Ais Yiorkis* and *Tenta* Periods 5 through 1. Similar trends were noted between *Ais Yiorkis* and various *Tenta* periods.

The raw material analysis revealed that *Ais Yiorkis* most closely resembles the distributions of *Tenta* Periods 5, Early 4 and 4. In terms of debitage blanks, *Ais Yiorkis* and *Tenta* period 5/4 share the most similarities, and tool blanks equate most with *Tenta* Periods 5 and 4. The dominant platform type, single, among the *Ais Yiorkis* assemblage correlates most closely to Period 5 among the debitage, and Period 4 among the tools, although truly similar trends are not seen for any one period. The *Ais Yiorkis* debitage assemblage has an unusually high incidence of crushed platforms compared to *Tenta*, which remains unexplained. The average length, width and thickness of the *Ais Yiorkis* blade debitage, blade tools, and flake debitage compare most clearly to Early Period 4, but the small samples of flake tools resemble Period 2 in length and width, and Period 4 in thickness.

The rates of flake and blade debitage most closely correspond with *Tenta* Period 5/4, while the *Ais Yiorkis* tool blanks are most similar to Period 5. The ratio of blades to bladelets is most comparable to *Tenta* Period 5/4, and the ratio of microflakes to debris resembles Period 5. Although the restricted analysis appears to have somewhat distorted the tool comparison, enough data was comparable to allow for a useful assessment. The rate of retouched flakes and blades at *Ais Yiorkis* is most comparable to Periods 3 and 4. While scrapers are among the most common tools at *Ais Yiorkis*, none of the numbers reported from Tenta approach this. *Ais Yiorkis* appears to have a comparatively low core population compared to all *Tenta* periods. *Tenta* Period 5/4 and 5 seem to represent the most comparable assemblages when general types were examined. Overall *Tenta* Periods 5, 5/4 and Early 4 stand out as the most similar in most cases.

CHAPTER 7

FINAL DISCUSSION AND CONCLUSIONS

This analysis of the chipped stone assemblage has proven Kritou Marottou *Ais Yiorkis* to represent a very complex and significant phase of the Aceramic Neolithic in Cyprus. As the Middle CPPNB is largely undefined, this analysis presented the first detailed description of chipped stone from this period. The objective was to generate a large scale comprehensive characterization of the chipped stone. The primary goal of this analysis was to explore and explain what the chipped stone assemblage tells about the people of *Ais Yiorkis* and their economic choices and lives. The process of characterizing the site required and included the analysis and presentation of a massive amount of qualitative and quantitative data. The challenge was to present and interpret this data in a meaningful way.

Chapter 1 introduced the project and outlined the important questions addressed here. Chapter 2 provided background information related to the prehistory of Cyprus and Chapter 3 focused specifically on the history and details of the *Ais Yiorkis* Archaeological Project. In Chapter 4 the methods and typological descriptions used in this analysis were considered, which not only provided insight into this research, but will serve to ease comparative research. Chapter 5 provided the primary presentation of the baseline data. The data offered here represents the most comprehensive analysis of its kind to date and can be used for comparative purposes in the future. Chapter 6 presented and detailed research questions investigating variation, association, distribution and comparison.

Ultimately *Ais Yiorkis* has been characterized within in the context of the prehistory of the Near East, Cyprus, the Neolithic, the Aceramic Neolithic and most specifically the Cypro-PPNB. This investigation revealed a great deal about the lives of the people of *Ais Yiorkis*, especially concerning the collection, reduction, production, utilization and discard of chipped stone artifacts as well as the technologies used in flintknapping, and the related technological and economic decisions. The economic management of the chipped stone at *Ais Yiorkis* includes the selection and importation of raw materials, the reduction of cores and production of blanks and tools, the use and discard of tools and the distribution of chipped stone artifacts throughout the site.

The characterization of the chipped stone assemblage provided the baseline data. This data was used in concert with the investigation of internal artifact variation to examine the larger chipped stone economy. The trends observed and questions answered via this analysis have revealed the processes involved in the collection, reduction, production, use and discard of chipped stone artifacts, informing the chipped stone economy of the people inhabiting *Ais Yiorkis*. Specifically portraying which and how tasks were conducted, revealing decision making processes related to site selection, raw material selection, and other economic and technological choices.

Contextual analyses looking at how the artifacts were found distributed throughout the site was used to address a variety of questions related to contemporaneity, site function and economy. While the overall site characterization and discussion of inter-site variation presents the basic breakdown of the chipped stone artifacts by classes and types, the contextual analysis looked at how these classes and types are distributed by unit and level. The contextual analysis revealed that the manner in which debris, debitage, cores, and tools are distributed throughout the site is very similar to the way that the categories, classes and types in the overall chipped stone assemblage are dispersed. The overall baseline numbers and percentages closely resemble the way the artifacts were distributed by unit. The locations of units and presence of population concentrations have informed interpretations related to the chipped stone economy, technology, and the site at large.

While agricultural plowing and bulldozer activity and terracing have been documented in the lower field, this distribution analysis has revealed two primary trends related to this portion of the site: 1) the type and extent of plowing activities that have occurred in the lower field have not had a noticeable impact on the chipped stone assemblage in terms of breakage (complete: broken) and/or artificial reduction affecting category, class or type, and 2) the deposits recovered from the units in the lower field probably represent the remnants of a destroyed site and/or wash/erosion from the upper field. The shallow soil with mixed havara inclusions and bedrock encountered near the surface, in combination with low density cultural deposits within the lower field, an area where bulldozing activities are known, indicate that any in-situ cultural materials have long been removed. The Feature 1 area is the obvious exception in the lower field, but actually can be seen as what remains of this portion of the site. Section A revealed a broad profile of dense cultural materials visible in the "terrace" wall suggesting a more dense upper terrace. In concert with the low density, highly disturbed deposits and removed lower field deposits, the distribution data from the upper field, along with more recent excavations in this area, reveal that this is the principal intact site area. The distribution within the intact, in-situ, upper field suggests that while midden units exist, *Ais Yiorkis* has a very large and dense chipped stone assemblage in general, indicating a flourishing, active and broad economy.

The inter-site comparison looking at Kritou Marottou *Ais Yiorkis* and Kalavasos *Tenta* inquired whether or not the *Ais Yiorkis* assemblage could be positively equated to one or more periods in the *Tenta* complex. This analysis looked for and revealed similar trends between *Ais Yiorkis* and *Tenta* periods. Although the *Ais Yiorkis* assemblage seems to have proven to be generally more dissimilar than similar to the *Tenta* assemblages, there are parallels between the *Ais Yiorkis* assemblage and the earlier

Tenta Periods. These parallels appear to agree with the Middle CPPNB chronological placement of *Ais Yiorkis* within the Cypriot Aceramic Neolithic. Overall, the analysis revealed that *Ais Yiorkis* and *Tenta* Periods 5, 5/4, Early 4, and 4 share the most trends in common. While a single most comparable *Tenta* period assemblage does not immediately dominate the comparison, the four primary periods follow the expectation that the radiocarbon dates recovered from *Ais Yiorkis* set. Although Early CPPNB deposits have not been documented via radiocarbon dating at *Ais Yiorkis*, (most dates point to the Middle CPPNB), the chipped stone assemblage shows a high degree of similarities to the earlier CPPNB period assemblages, Period 5 and 5/4. The *Ais Yiorkis* assemblage also shows a relationship to Early Period 4 and Period 4, which have been identified as Late CPPNB. The strongest or the most similarities appear to be between the *Ais Yiorkis* assemblage and that from *Tenta* Period 5/4. As previously discussed, Period 5/4 appears to represents a mixed deposit.

The association between the *Ais Yiorkis* assemblage and the Tenta Period 5/4 assemblage can be interpreted as suggestive of two primary options. First, it can be proposed that Tenta Period 5/4 was not a mixed deposit and that it represents a middle period between Period 5 and Early Period 4, although this possibility is slim as it was identified as mixed via archaeological methods not through analysis. The second option considers that while Tenta Period 5/4 is a truly archaeologically mixed deposit it in fact portrays the MCCNB, which may have combined both Period 5 and Early Period 4/Period 4 chipped stone economic strategies, enticingly suggesting that the Middle CPPNB, as evidenced at *Ais Yiorkis* truly does represent a transitional time between the Early CPPNB and the Late CPPNB. It seems that while given attributes from the *Ais Yiorkis* chipped stone assemblage can be shown to be similar to various *Tenta* periods, the *Ais Yiorkis* assemblage has largely proven to be disparate, which further attests the sites idiosyncrasies.

The use of naviform core technology, the focus on and/or preference for blade tools, and the continued but extremely limited production of projectile points, albeit rudimentary, suggests at the very least the memory or intentional replication of the dominant mainland PPNB technology that was being employed at this time. The presence and use of small amounts imported obsidian also provides a link to the mainland and evidences some level of contact. These aspects, in conjunction with faunal, botanical, and other symbolic/artifactual evidence lend to the significance of *Ais Yiorkis* within the greater context of the Near East.

All of the major trends discussed related to the chipped stone assemblage at *Ais Yiorkis* are quite revealing about the nature of the assemblage and intent of the knappers. At *Ais Yiorkis* people were knapping a great deal of stone, and producing a massive amount of debris and debitage. This study has proven the assemblage to be contemporary, has shown that within the site there is a low degree of variation, and has revealed a largely systematic use a of a distinctive, possibly site specific technology, not shared with, borrowed or copied from *Tenta* peoples or periods. The results are significant in themselves, but the definition of the site does not stand alone, but in fact documents a period in the prehistory of Cyprus that has until now been largely undefined.

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