STATUS AND SOCIETY IN THE GREEK NEOLITHIC: A MULTI-DIMENSIONAL APPROACH TO THE STUDY OF MORTUARY REMAINS

by

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A Thesis
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STATUS AND SOCIETY IN THE GREEK NEOLITHIC: A MULTI-DIMENSIONAL APPROACH TO THE STUDY OF MORTUARY REMAINS

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What could be more universal than death? Yet what an incredible variety of responses it evokes. Corpses are burned or buried, with our without animal or human sacrifice; they are preserved by smoking, embalming or pickling; they are eaten - raw, cooked or rotten; they are ritually exposed as carrion or simply abandoned; or they are dismembered and treated in a variety of ways. Funerals are the occasion for avoiding people or holding parties, for fighting or having sexual orgies, for weeping of laughing, in a thousand different combinations. The diversity of cultural reaction is a measure of the universal impact of death. But it is not a random reaction; always it is meaningful and expressive.

Huntington and Metcalf 1979:1

Every archaeologist must accept the following challenge: archaeological observations are contemporary facts and they are static facts. Our job is to make meaningful observations about the past from contemporary facts and to make meaningful statements about dynamics from static facts. In order to accomplish this, the archaeologist must have a strong body of theory - middle -range theory - which guides him in making statements about dynamics from observed statics. In short, we must have a strong and well-founded understanding of the formation processes of the archaeological record.

Binford and Bertram 1977:77

ABSTRACT OF THE THESIS

Although the theoretical approach to the study of mortuary remains as social information was crystallized in the 1970's, there is still much debate regarding the methodological enterprise of mortuary archaeology. Much of this debate centers around the quantification of mortuary data, and whether the patterns observed from these analyses are more apparent than real. As a consequence, there have been many methodological approaches put forward to reconstruct social behaviors from mortuary behaviors. In this thesis, I review the errors and valued contributions of this research and propose a new method for mortuary analysis. This methodological approach is based upon the premise that the social rank and statuses held by members of a community provide better structural referents to the composition of a social system. Three dimensions of social distinctions are targeted for analysis in this study: vertical, horizontal, and special status distinctions. A new technique is employed to quantify these dimensions of social distinctions. A mathematical model that delineates the structural and organizational properties of a social system using ratio and interval scales is then used to monitor social development and change over time and space. The mortuary data from the Greek Neolithic (6500-3200 B.C.) is used to illustrate this new methodology and its applicability to the study of social formation.

The concepts and qualitative methods developed in this thesis proved useful in the study of Greek Neolithic mortuary differentiation, social distinctions, and social development. The quantitative methods employed in this thesis revealed patterns of social differentiation and development that in many ways parallel the qualitative suggestions of earlier research. There is strong evidence to suggest that rank and status differentiation existed in Greek prehistory far earlier than previously expected. Overall, the results of this analysis suggests that the Greek Neolithic can no longer be characterized as a time when various semi-nomadic and sedentary groups lived during a period of social equality. Instead, it appears the economic and social inequality that characterizes subsequent periods of Greek prehistory have their origin in the Neolithic.

PREFACE AND ACKNOWLEDGEMENTS

As is the case with many academic works, this thesis is a product of what Nobel Laureate and physicist Stephen Wilkinson has called "creative worry." In the course of my graduate studies I became increasingly disconcerted with myriad of archaeological approaches to studying society, social formation, and social collapse. This thesis presents my thoughts and views on this subject. This work does in no way represent a completion of these thoughts. Rather, I consider this incarnation as the beginning of an exploration that attempts to evaluate social relationships in prehistory by looking at cultural reactions to death.

These ideas would never have been fostered, nor this work accomplished, without the insight, guidance, and support of numerous people. First of all I would like to thank the members of my committee: Haskel Greenfield, Christopher Meiklejohn, and Lea Sterling. They made their knowledge of the broad range of issues addressed in this thesis readily available.

I am much in debt to Dr. Greenfield for his patience, guidance and friendship throughout the process of developing and writing this thesis. I would like to thank Dr. Townsend and Dr. Raymond Wiest for comments on an earlier draft of Chapter 2. A special thank you is extended to Dr. Tracey Cullen for her help in guiding me through the Franchthi Cave material. I would to extend a special acknowledgment to Dr. Michael Cosmopoulos for first introducing me to the richness of Greek prehistory through his entertaining lectures and the fieldwork I was fortunate enough to participate in under his tutelage. I appreciate his comments on an early draft of the manuscript, which helped greatly in its development.

Finally, I would like to thank my family, who have provided me with both moral and financial support. First, my parents, Doug and Buella, and my sister Aujah have traveled with me along the six tumultuous years it took to reach this point. Forever I am in their debt. Last, and by no means least, my wife Karen has literally taken care of me throughout the development and writing of this thesis. Without her this research would never have been completed.

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CHAPTER 1

INTRODUCTION TO THE PROBLEM

I. Introduction

This thesis represents an archaeological attempt to understand the meaning and expression of cultural reactions to death. The "archaeology of death," as it has been called (Chapman and Randsborg 1981), is certainly not new to archaeological inquiry. The subject is also not new to the public. New mortuary findings have always prompted public and professional enthusiasm - from the discovery of Tutenkamen's tomb, to the Siberian "Ice Queen," to the unparalleled "Ice Man" found in the Austrian Alps.

Mortuary archaeology, as it is now known, has a long and opulent history. For much of the 19th century, most of what was known about the Neolithic, Bronze, and Iron Ages was gained from funerary remains. To this day, some cultures, such as the Badarian culture of predynastic Egypt, are best known from their burials. Some have suggested that the earliest archaeology was the beginning of mortuary studies (Chapman and Randsborg 1981:3).

Archaeologists traditionally viewed mortuary remains with skepticism. It was generally thought that little could be gained from studying the relics of the dead. Many early investigators studied only the richest graves (e.g., Swanton 1911) at the expense of the poorer ones, or were interested in the "fashion-trends" of burial practices (e.g., Kroeber 1927). In North America, archaeology moved from speculation in the 19th century, to chronological and cultural concerns throughout the early part of the century (Willey and Sabloff 1980; Trigger 1988). Beginning in the 1960's, the New Archaeology changed the nature of archaeological inquiry forever. This reaction against the pessimistic views prevalent in the 1940's and 1950's, broke the boundaries of how archaeologists explained the past. Mortuary practices played a key role when archaeologists began to argue that we *can* reconstruct relationships between material culture and living culture (e.g., Ucko 1969; Binford 1964, 1971; Saxe 1970; Brown 1971b). Throughout the 1960's and 1970's archaeologists began to use mortuary practices to talk about society. The basic premise of these studies was that differences in mortuary practices could be attributed to different statuses held by the people when they were alive. It has been more than twenty years since the social approach to mortuary studies was crystallized (Brown 1971b). Since this time many archaeologists have been preoccupied with reconstructing society from mortuary remains. This thesis continues this tradition.

II. Purpose of the Study

The present study reflects a research interest in archaeology involving the problems surrounding processualist and post-processualist interpretations of mortuary remains as social information. The primary goal of such research is still to determine the range of socioeconomic differentiation expressed through mortuary activity. The approach, however, utilizes middle-range theory. However important the theoretical perspective is, mortuary archaeology is largely a methodological enterprise, experimenting with analyses that reconstruct social relationships from mortuary patterns.

Since the 1970's, mortuary studies have gone several different directions. More recent work has focused upon site specific studies (e.g., Beck 1995; Douglas and Brown 1985), while others have concentrated on regional analyses (e.g. Beck 1995; Campbell, Stuart and Green 1995), or applying mortuary analyses to problems of social development (e.g., Price and Feinman 1995; Wason 1994). However, in a review of Wason's (1994) recent monograph, Kohl (1996) has observed that most of this research has only reaffirmed the obvious. Little can be gained from knowing that society has a ranking system or a wide range of different social statuses. What is important, as will be argued in the present work, is how rank and status is structured *and* organized. Most social reconstructions that are based upon the analysis of funerary remains are the product of inexplicit and non-standardized analyses. As a consequence, redundancy of results and interpretations are seldom performed or possible. This is most apparent in the recent debate over O'Shea and Zvelebil's (1984) interpretation of the 'Oleneostrovski mogilnik hunter-gatherer data from northern Russia (Jacobs 1995; Brinch-Peterson and Meiklejohn 1995).

As will be described in later chapters, mortuary studies have not made a concentrated effort to define the stuff that is society: rank, status, structure, and organization. Most of the recent research has only focused upon delineating differences in social rank and status, while neglecting the structural and organizational aspects of society. In this thesis I will present a new methodology that targets all the aspects of a social system for analysis. The method generally argues against the mortuary archaeologists' reliance upon complicated statistical approaches and the use of anomalies to interpret and explain social differentiation and change (e.g., Tainter 1973, 1975, 1978; Brown 1981; Gordon and Buikstra 1981; O'Shea 1984; Brown 1987). Furthermore, the methodology is made explicit and therefore invites corroboration of results. To illustrate this new methodological approach I will use mortuary data from the Greek Neolithic period.

A. Summary of the Thesis

In Part I of this thesis, I will examine how anthropology and archaeology have theoretically gone about studying society and social formation (Chapter 2 and 3, respectfully). In Chapter 4, I will outline the methodological approach taken in this thesis. The background to the Greek Neolithic will be presented in Chapter 5. In Part II, I will investigate the mortuary differentiation and social distinctions detectable in the Neolithic mortuary sample. In Part III, I will examine the classes of change that may occur in a mortuary complex through time and space. I will also explore the potential constraints or systematic aspects of such change (Chapter 10). In the final chapter, Chapter 11, I will integrate the current analysis with recent views on how settlement pattern, settlement architecture, subsistence, technology and crafts, and trade and exchange reflect social attributes of Greek Neolithic societies.

III. The Greek Neolithic Period

This thesis is a study of society and social development during the Neolithic period of Greece. Under this general theme I will examine the structural and organizational aspects of societies dating from the Early to Final Neolithic phases (6500-3200 B.C.). This investigation of Greek Neolithic society will focus on examining the mortuary assemblages for evidence of social ranking and other means of socioeconomic differentiation, rather than making a comparative study of burial customs (e.g., Hourmouziadis 1977), employing insensitive evolutionary typologies to measure social change and complexity (Renfrew 1972; 1982), or making social inferences using only ceramic data (Cullen 1985; Demoule and Perlès 1993). This analysis of mortuary distinctions and social parameters will be described in both geographical and chronological terms. The results of these analyses will also be related to specific regional developments in the cultural-history of the Neolithic period. Therefore, regional and chronological variations in society will be compared and related to major developments and changes in settlement, technology and economy.

In using the Greek Neolithic data, I will address both theoretical and methodological problems faced by studies of prehistoric social development. My principal thesis is that settlement location, scale, and economy are not variables which allow the structural and organization aspects of a prehistoric society to be modeled adequately. Rather, it will be argued in this thesis that the social rank and statuses held by members of a community provide better structural referents to the composition of a social system. Furthermore, by monitoring changes in these elements of a social structure, the social development of a single society, societies inhabiting a common region, and social changes over time, can be sensitively described and compared. In the pages that follow, I will make explicit both the errors and valued contributions of previous research on the study of social development, how social structure and organization may be described through an investigation of mortuary remains, and how a spatial and temporal analysis of these data may be used in conjunction with studies of settlement location, scale, and economy, to suggest testable regional and chronological hypotheses of social development.

A. Geographical and Chronological Scope of Study

There are several reasons why I have chosen to study society during the Neolithic period of Greece. The principle reason is because of the unique place it holds geographically between the Near East and Europe. Perhaps it is this unique position that has allowed the prehistoric and historic cultures living in modern Greek lands to play the roles they have in the development of the Near East, European, and Western culture. The modern country of Greece is composed of a large peninsula thrusting out into the eastern Mediterranean, and a package of over 500 islands scattered throughout the Aegean Sea (Illus. 5.1). It is segregated from the rest of Europe by several high mountain ranges. The geographic reality of Greece has nevertheless allowed movement of peoples into the peninsula, and has also promoted unique cultural, social, economic, political, and technological developments.

The chronology used in this thesis is based upon calibrated radiocarbon dates, and expressed in approximate calendar years (Table 1.1). In this study, I will follow the recent dates given by Demoule and Perlès (1993) for the chronological phases of the Neolithic.

Period	Phase	
Neolithic	Early Neolithic	6500-5800 B.C.
	Middle Neolithic	5800-5300 B.C.
	Late Neolithic 1	5300-4800 B.C.
	Late Neolithic 2	4800-4500 B.C.
	Final Neolithic	4500-3200 B.C.
Bronze Age*	Early Bronze Age I	3200-2600 B.C.
	Early Bronze Age II	2600-2300 B.C.
	Early Bronze Age III	2300-2000 B.C.

***Table 1.1.** The chronology of the Greek Neolithic and Early Bronze Age expressed in calibrated calendar years. Source: Demoule and Perlès 1993. * The Bronze Age dates are listed here only as broad reference points and are given in approximate calender years.*

B. Reviewing the Character of Neolithic Society

No longer is the Greek Neolithic period viewed as an indigent offshoot of the Near East (Childe 1934, 1936; Weinberg 1954, 1965; Mylonas 1957:27, Smith 1965; Caskey 1964:36; Vermeule 1964:26; Sherratt 1981, 1983). Instead, it is now argued that local dynamics during the Greek Neolithic should be viewed in a southeastern European context (Demoule and Perlès 1993:405). This is particularly apparent during the Late Neolithic (LN) and Final Neolithic (FN) phases, when the Greek Neolithic shows much the same character as cultures in southeastern Europe. It is unlikely, however, that this was a southeastern European *koine*[1], as Demoule and Perlès (1993:405) suggest. This statement is controversial mainly because it implies a common *culture*, moreover, a common *ethnicity* in southeastern Europe during the Neolithic. Those who take this viewpoint apparently do not see the difficulty in arguing for local uniqueness, yet common ethnicity or culture over such a large geographical area (i.e., the entire mainland). Furthermore, one cannot still maintain that the cultural traditions of Neolithic Greece more often resemble the Near East than temperate Europe. There are many commonalties in material culture and behavioral patterns in southeastern Europe during the Neolithic, to be certain, but this does not immediately suggest a common archaeological culture (Clarke 1968).

From a recent review of the available data, six characteristic trends have been proposed for the Greek Neolithic (Demoule and Perlès 1993:405-406), identifying it by:

1. a true farming economy, based on exogenous species with very little use of wild local resources;
2. permanent villages of very long (several centuries) duration, developing as tells rather than as flat, expansive settlements, with unusually dense concentration in alluvial basins;
3. extensive trade in utilitarian goods and evidence for early craft specialization;
4. an unusual proportion of fine, highly decorated wares and a surprising scarcity of cooking wares until late in the Neolithic;
5. the ephemeral character of signs of social inequality or hierarchical organization; and
6. the absence of funerary or ritual monumental architecture.

C. Problems in the Study of Greek Neolithic Society

The main problem in the study of Greek Neolithic society is that research over the past century has not focused upon sociological issues.[2] Further, it is generally argued that there is not enough adequate data to support a detailed investigation of social systems in the Greek Neolithic period (e.g., Cullen 1985:97). However, I am hesitant to agree with this later observation. Research strategies into Greek Neolithic social parameters have never employed a dual diachronic and comparative approach to the data. Neolithic society has only productively been studied using one of two sets of data, and never in concert: variability in the decorative styles of ceramic assemblages of a specific time period (Middle Neolithic; MN), or mortuary data (30 individuals dating from the Early Neolithic (EN)-Final Neolithic). The assumed lack of quality data is reflected in the very small number of studies into Greek Neolithic society. There has only been one study of the variability in ceramic styles by Cullen (1985), and the only mortuary data to be treated even as a source of sociological data has been from Franchthi Cave (Jacobsen and Cullen 1981). However, this is not surprising. It is traditional in Greek archaeology to study ceramic assemblages in terms of chronology, and for mortuary data to be discussed in terms of burial customs or ritual, or what can be gleaned of the ideological workings of the society (e.g. Hourmouziadis 1977; Demoule and Perlès 1993). Neither of these approaches goes beyond the descriptive.

Because of these *a priori*, traditional and philosophical limitations set upon research, the scope of previous research into the origins of social differentiation in the Aegean has been limited to time periods of high archaeological visibility. Consequently, investigators have largely concentrated their efforts on the period succeeding the Neolithic, the Early Bronze Age. Renfrew (1972), Pullen (1985), Wienche (1989), Cosmopoulos (1991), Forsen (1992), and others describe the Early Bronze Age as a period where the results of changes played out in the Neolithic are most visible. This is particularly apparent in the social make-up described for the two periods.

For the Neolithic, research has continually supported the hypothesis that various sedentary and semi-nomadic groups lived during a relatively uneventful period of social equality (e.g. Renfrew 1977; Warren 1989:60; Demoule and Perlès 1993; Cullen and Talalay 1995). However, at the same time, it is argued that the origins for the complex societies observed in the Bronze Age, must lie in the final stages of the Neolithic (Renfrew 1972:80; Pullen 1985:102-105; Demoule and Perlès 1993:405-407). In contrast, the Early

Bronze Age (EB 2) is heralded as having the first evidence in Greek prehistory for segmented societies in the form of chiefdoms (EB2, Mainland) and tribes (EB2, Cyclades and Crete) (Cosmopoulos 1995). These are societies with distinct socioeconmic levels represented by individual wealth and membership in socioeconomic groups (Pullen 1985; Cosmopoulos 1991; 1995). These contradictory views necessitate more detailed investigation.

Recent research into the origins of social inequality in eastern Europe (Price and Feinman 1995) has suggested that hierarchical social organization did not develop until sedentary, agricultural communities arose in the Neolithic. Despite these social developments in eastern Europe, complex society has only been recognized in the rich material culture of Early Bronze Age. Even though the precedent for complex society in the Aegean has been given to the Neolithic, the possibility that social inequality existed any earlier than the Early Bronze Age has not been tested. It will be argued in this thesis that the assumptions about Neolithic society are a by-product of the ineffectual measures employed in previous analysis.

IV. The Study Area and the Data

A. The Geographical Area of Study

The study area for this thesis emphasizes the most intense regional clustering of settlement in the Greek Neolithic period. These regions are, essentially, the "heartlands" of Neolithic culture. It is here that the most intense evidence of Neolithic settlement has been discovered. To facilitate a spatial analysis of mortuary differentiation and social distinctions, the study area has been divided into three spatial zones: 1) macrolocation; 2) mesolocation; and 3) microlocation. The macrolocation is the largest spatial unit, and here sites to the north and south of the Pindos mountain range are addressed as two individual units. In this study, the Northern sites are located in Thessaly, the Southern sites are located in Attica, the Argolid, southern Laconia, and on the islands of Euboea and Kea. The purpose for this division is also cultural. Research on the Greek Neolithic (cf. Theochares 1977; Demoule and Perlès 1993) has consistently described significant cultural differences between these two areas of Greece during the Neolithic period.

The two large zones are also discussed in terms of mesolocation, which examines the regional clustering of sites. The mesolocation of sites is defined by distinct aggregation of settlement and by close material cultural affinity between these settlements. There are four regional units. Region 1 encompasses the sites of Plateia Magoula Zarkou and Souphli Magoula in central Thessaly. Region 2 includes the sites of Kitsos Cave in Attica, Tharrounia on the island of Euboea, and Kephala on the island of Kea. Region 3 includes the sites of Prosymna, and Franchthi Cave located in the Argolid. Region 4 is represented by only one site, the Aleopotrypa Cave, located in southern Laconia.

The third unit that will be used in spatial analysis of the sites is the microlocation. The microlocation takes into account the immediate environmental and ecological conditions and the resources available to the Neolithic inhabitants of the sites. A general understanding of the local resources and the possible extent of the catchment area of each settlement plays an important role in mortuary analysis. For example, this information can help identify the locality of the materials used to build graves or manufacture burial furniture. It can also help define the strategies of procuring such items as obsidian or metal through trade or exchange processes.

In this thesis, I focus largely on the mainland because most of the mortuary remains from the Cycladic Islands and Crete date to the Bronze Age (Branigan 1970; Doumas 1977; Cosmopoulos 1991), or have already been addressed (see recently Broodbank and Straser 1991). However, I have included the Cycladic islands of Kea and Euboea in the study area for reasons similar to that of Pullen (1985:51): first, because of their proximity and notable cultural affinity with the eastern mainland; and second, because Kephala on Kea and Tharrounia on Euboea provide us with two well documented cemeteries from the Greek Neolithic. While the mainland provides evidence of the most intense Neolithic occupation, the amount of mortuary data is quite limited. However, mortuary data has never been systematically collected and placed within the context of multi-site interpretation that will be proposed in the following chapters.

B. The Data

The quality and quantity of mortuary remains dating to the Greek Neolithic period are a result of three factors. First, the frequency of excavations has varied by region, and this has limited the identification of burials to certain intensively studied areas of the mainland and several of the Cycladic islands. Second, it has only recently been recognized that most Neolithic burials or burial grounds are spatially separated from open-air settlements. The disposal areas used by inhabitants of caves are generally found within a separate section of the same cave. This common spatial distinction between disposal area and settlement (or occupation area) was not recognized by early excavators. Therefore they often did not venture exploratory soundings too far outside the settlements. Many of the disposal areas dating to the Neolithic have become known mainly as a result of modern construction that exposed the prehistoric disposal area (e.g., Souphli Magoula, Plateia Magoula Zarkou). More recent excavations (since the mid-1970's) have purposefully attempted to locate Neolithic burial grounds by executing test trenches around the settlement (e.g., Kephala, Tharrounia). Third, the apparent size and scale of the disposal areas during the Greek Neolithic are not only a result of excavation and recovery strategies, but are also a reflection of the size of the associated settlements and how long the settlement was inhabited. In general, Greek Neolithic cemeteries are small, and C^{14} samples from the sites suggest that single occupation levels did not extend beyond several centuries. Even sites such as Franchthi Cave, which was inhabited from the Upper Palaeolithic to classical times, were occupied sporadically throughout the Neolithic. The occupation of many sites seems to be redundant, but not consecutive, and many are thought to be seasonal settlements (cf. Jacobsen 1984; Sampson 1992, 1993).

For this study, I initially proposed to investigate twenty-one sites that had associated burials. However, upon closer study of the available data, many of the site reports did not hold information that met the basic requirements for analysis. For example, several sites only had one burial recorded (Servia), many site reports gave no descriptions of the burial facilities or associated grave goods (Rhodochori Cave, Rachmani), and several reports had no information beyond a description of the skeletal remains (e.g., Nea Nikomedia). Other sites, such as Lerna, had well-recorded burial data. However, most of the individual burials were not contemporary, and dated to more than one phase of the Neolithic. For this analysis, it was desirable to study conterminous burials. For this reason, only groups of contemporary burials were considered in this analysis.

As a result of these restrictions, eight sites representing eleven different temporal occupation levels are focused upon in this thesis. The burials at these sites represent the largest samples, and some of the best documented and preserved burials of the Neolithic period. Admittedly, the overall sample is small. It is, however, adequate for the current analysis. To remind the reader, the purpose of this analysis is to evaluate and compare mortuary differentiation and social distinctions across time and space, and relate these observations to previous studies of settlement, subsistence, trade and exchange, etc. This study is not designed to answer how or why change and variation occurred during the Greek Neolithic. Rather the purpose of this study is to establish what changes and variations occurred, where they occurred, when they occurred, and what are some possible mechanisms of change acting during the Greek Neolithic. Targeting the best documented and preserved mortuary remains of the period allows hypotheses regarding social differentiation, change, and variation during the Greek Neolithic to be tested.

V. Hypothesis Testing

This study will address two hypotheses that have been made regarding the development of society during Greek prehistory in general. The first hypothesis suggests that evidence for social disparity and hierarchical social structure and organization did not exist during the Neolithic (cf. above), and is only observable in the succeeding Bronze Age (cf. Renfrew 1977; Warren 1989:60; Demoule and Perlès 1993; Cullen and Talalay 1995).

If Neolithic societies do show hierarchical attributes, it has been argued that these would only be observable in the archeological record in the final phase of the Neolithic (Renfrew 1972:80; Pullen 1985:102-105; Demoule and Perlès 1993:405-407). Therefore this hypothesis relates to the origins of social inequality in Greek prehistory. This study will investigate if there is any indication that social inequality or heterogeneity existed during the Greek Neolithic.

The second hypothesis relates to the change and variability observed in the Greek Neolithic record- not why variation and change occur, but how it is explained. For the Greek Neolithic, social change has been explained as a result of external influence upon society, or as a result of internal changes. External influence is generally argued to result from the arrival of new populations in the area (e.g., Mylonas 1957:27; Smith 1965; Weinberg 1954, 1965; Caskey 1964:36; Vermeule 1964:26), or by the introduction of cultural advancements from the Near East (Childe 1934, 1936; Sherratt 1981, 1983). On the other hand, social developments have also been explained in terms of local processes by using a systems model (Renfrew 1972). Therefore, I will investigate whether the Greek Neolithic social data suggests a more likely development through local processes or external influences from the Balkans and/or the Near East.

Notes to Chapter 1

[1] The Greek term *koine* roughly means "common" in English.

[2] During November of 1995, the Sheffield Centre for Aegean Archaeology sponsored a round table discussion entitled "Neolithic Society in Greece." At the time of writing, no papers resulting from these discussions were published. None of the topics listed in the publication *Nestor* (1995, 22[8]), however, focused specifically on *society* during the Greek Neolithic.

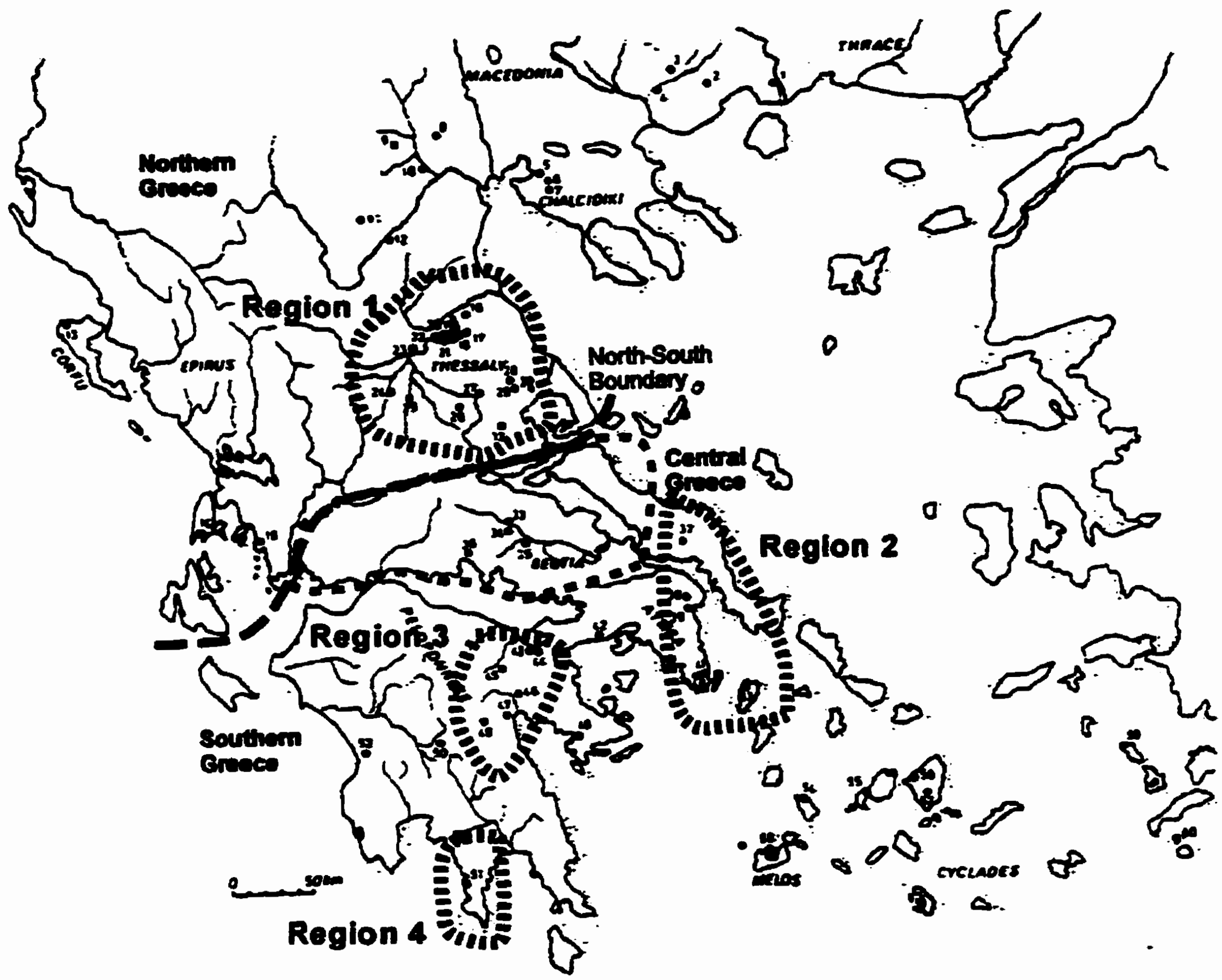

Illustration 1.1. Map of Greece showing the study area and location of sites discussed in text (except Crete). After Demoule and Perlès 1993:Fig. 1. (1) Pradeisos; (2) Dikili Tash; (3) Sitagroi; (9) Nea Nikomedia; (10) Rhodochori Cave; (12) Servia; (16) Rakhmani; (17) Gediki; (18) Souphli Magoula; (19) Arapi; (20) Otzaki; (21) Argissa; (22) Agia Sofia; (23) Plateia Magoula Zarkou; (24) Prodromos; (25) Tsani; (26) Achiilleion; (27) Tsangli; (29) Sesklo; (30) Dhimini; (31) Pevkakia (33) Elateia; (35) Chaeroneia; (37) Tharrounia; (40) Kitsos; (41) Thorikos; (43) Corinth; (44) Gonia; (45) Nemea; (46) Prosymna; (47) Lerna; (48) Franchthi; (49) Ayioryitika; (51) Alepotrypa; (52) Ayios Dimitrios; (53) Kephala; (55) Saliagos; (57) Zas Cave; (58) Melos; (60) Gali.

PART I

THE STUDY OF SOCIETY

CHAPTER 2

THE ANTHROPOLOGICAL STUDY OF SOCIETY

"Basically, the test of language used for scientific expression is measured, not by truth or falsity per se, but by ability to convey distinctness, similarity, identity, independence, dependence, association, and other presences or absences of relationship, all to the nicest degree."

Morton Fried 1967:4

"[T]he world of humankind constitutes a manifold, a totality of interconnected processes, and inquiries that disassemble this totality into bits and then fail to reassemble it falsify reality. Concepts like "nation," "society," and "culture" name bits and then threaten to turn names into things. Only by understanding these names as bundles of relationships, and by placing them back into the field from which they were abstracted, can we hope to avoid misleading inferences and increase our share of understanding."

Eric Wolf 1990:3

I. Introduction

The study of society holds a unique place in the conception of ourselves as sophisticated social animals. It has long been a subject of discussion for those concerned with the nature of society and culture. Debates over the way in which our most ancient ancestors behaved socially have their origins in the early philosophies of antiquity the world over. Greek, Roman, as well as the Arabic and Hebrew doctrines, particularly influenced thoughts in the later 18th and 19th century philosophies, from which modern anthropology and sociology trace their roots. This chapter serves to address some of the most pervading ideas that have shaped both how we view and study ourselves. In the following pages, I will briefly trace these themes as they relate to the issues encapsulated by the comments of Morton Fried and Eric Wolf above: 1) the language of the study of society, and 2) how society has been approached analytically and theoretically. It is from these origins that archaeology has drawn many of its concepts of culture and society. These concepts have changed as the study of society has gone through a process of theoretical and methodological maturation.

II. The Language of the Study of "Society"

In surveying how society has been studied, I find it first necessary to define the language that is used to study society. As stressed in the comments by Wolf and Fried above, the language of a discipline holds a key place as broad categories of reference. The language we use is not just a vehicle for our concepts, but it is an instrument which can shape and even determine our concepts (Renfrew 1979:51). Discussions of terminology may seem tedious, but they are not trivial. They provide a platform for us to build our theory and develop and justify our methods.

Perhaps the most fundamental problem that characterizes the language of studying society is describing not what society is, but what it is composed of. In these terms, it is imperative to define society in opposition to culture. Although culture is not easily defined (Kroeber and Kluckholm 1952), there is some agreement on what should constitute the concept of culture. Instead of undertaking the daunting task of adding another definition to an already long list, I would prefer to follow Gary Ferraro in emphasizing what a definition of culture must include: 1) material objects, 2) ideas, values, and attitudes, and 3) patterned behavior (1995:17).

The fundamental difference that has been made between "culture" and "society" is that only humans have culture. Society, then, is a term concentrating attention on groupings, and for this reason a definition by Aberle and his colleagues serves to make this distinction:

> A society is a group of [...] beings sharing a self-sufficient system of action which is capable of existing longer than the life-span of an individual, the group being recruited at least in part by the sexual reproduction of its members [Aberle *et al.* 1950:101, quoted in Fried 1967:8).[1]

With this definition however there is no indication of context. In this respect, Wolf has made an essential observation. Wolf argues that society must be understood as being in flux, without fixed boundaries or a stable internal composition (1990:387). Essentially, "society" is less an aggregate of emerging and changing alignments of social groupings, as it is an analytical unit to study the dynamics of the social groupings. It is with these basic notions of flux, dynamics, and variability, that society has been modeled as a system, with constituent parts (social groupings), changing boundaries (social structure), and the forces that organize and hold this system together (social organization). If this concept of society is at the least acceptable and operational, then why, as Wolf (1990a:4) states, are dynamic, interconnected phenomena turned into static, disconnected things? Sociology continues to divide the world into separate societies, and anthropology views each society as having a unique culture. Societies are modeled as integrated and bounded systems contrasted to other sets of integrated and bounded systems (Wolf 1990a:4).

In this thesis I take the position that society must first be understood by its most basic elements: structure and organization. By including time in this equation, the results of the dynamic, interconnected phenomena acting upon and within the societies can be described. This then allows a discussion of interconnectedness. As Wolf has said, "I think we must move [...] to analytical concepts that allow us to set what we know about X against what we know about Y, in explanation" (1990b:587).

As such, an approach of this kind is not concerned with what the particular processes acting upon a society are. Rather, the first step in explanation is one of description: we must first understand and acknowledge the pattern of social actions we observe over time before undertaking the project of describing how this pattern came about. In the descriptive process, it is imperative to use a language that links the variables of the society we study to the concepts which drive the explanation.

A. Defining "Society"

Perhaps the most confusing problem that has arisen in the language used to study society is the confusing distinction between social structure and social organization. Social organization has long been a "catch-all" term used to signify the nature of a particular society. Social organization is often equated with a type of society. The particular type of organization is equated with societies of certain sizes, technologies, production strategies, etc. The result is a certain preconceived social arrangement of the people involved. Hence, the terms "stratified societies," "ranked societies," "peasant societies," "chiefdoms," and so on, have appeared. In historical terms, this language has just replaced the rubric of the stages in sociocultural evolution. These early theories were formed during the Enlightenment, in the late 18th and 19th century. The jargon of this time can still be found in the literature today although the concepts behind them have since proved oversimplified and unwarranted (Wolf 1970;180), telling us little about the cultures they posed to represent (cf. Kish and Yoffe 1996:290). In the process it seems the purpose of the exercise had become lost on the evolutionists: what is society composed of, instead of how did society *become*.

1. Social Structure and Organization

In its wake, sociocultural evolutionary theory has left social structure often confused with social organization, or it is used interchangeably. Social structure and social organization are however two conceptually different aspects of a society (Fig 2.1). Social structure can be defined as the network of social relations in a society; it is the total pattern or repertoire of social positions or statuses which a society offers its members (Gibb 1964:164).

Social structure is an abstract level for inquiry, and is best approached using analytical models (Fried 1967:8-9). The primary unit in a structural model of society is a social status. Social status is the relative social position of the individual assigned on the basis of birth or attained through the effort of the individual. In other words, there are two main categories of status: ascribed and achieved. For example, kinship status is a class of ascribed status (i.e. "mother," "father," "brother," "aunt," etc.). On the other hand, the term "Bigman," used to denote Melanesian leaders of renown (Sahlins 1963), is a class of achieved status. From these examples, it becomes apparent that these classes of status have two parts, the structure of the roles involved and the associated behavior.

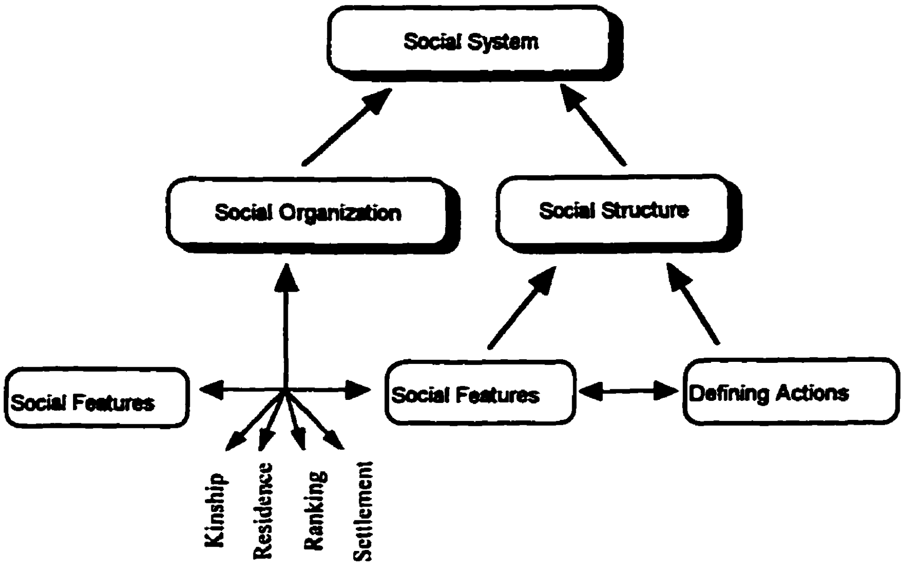

Figure 2.1. The principal components of a social system.

Social structure actually consists of two specific aspects: social behavior and what are termed here "social features." *Social features* are the "sub-systems" of a social structure; they are the units of social structure that carry out a distinct and specific process (cf. Tainter 1977a:328). Some social features may be kinship, residence patterns, ranking, settlement, marriage patterns, and non-kin based social membership. These features serve to define the positions or statuses available to the members of that society. The number, nature, and composition of the features define the social structure. In discussions of "complex" societies most social researchers term these units "institutions" (e.g. Service 1965). The basic difference between these social groupings in "primitive," "non-literate," or "prehistoric" societies is simply that the number and composition of the social features is smaller, and constitutes a fewer number of people involved. Again, size has mattered in these definitions.

The other aspect of social structure is behavior. *Social behavior* is recognized as the roles associated with the social statuses and positions; they are the actions that define the social positions or statuses (Gibb 1964:164). A *social role* is primarily understood as the rites and duties society expects an individual to display in a given relationship (cf. Howard 1989:456; cf. Goodenough 1965). These ideas can be more easily conceptualized if statuses are thought of as a bundle of roles commonly combined in one social person (Fallers 1965:238). A social rank, then, can be viewed of as a bundle of social statuses.

In contrast to social structure, *social organization* can be defined as the constraints imposed upon the ranges of behavior that may be pursued by the members of a social system (Rothstein 1958:34-36). Organization is the patterned interaction among the social features (Tainter 1977a:328). It is only under a system of constraint that organization can exist, for if there is no organization the system would be random or chaotic. Ideally, this situation does not allow the members of the society an environment to make decisions or selections that would be advantageous (although this is not always the case anyway).

Most of the anthropological approaches to studying society equate social organization with the totality of interrelationships in a particular type of society. Even Fried, who subscribed to the understanding that social organization refers to the relations that exist among the parties of a society, succumbed to this pitfall in his definition of social organization:

> "By the term 'social organization' we comprise the totality of patterned relations among the members of a society, the subgroups formed in the course of these relations, and the relations among these groups and their component members (1967:8).

In this definition, the term "organization" is conceptualized much the same as it is in the modern usage of the word "organism": "[an] organized body with connected interdependent parts sharing common life (The Concise Oxford Dictionary 1985). However, most important to the term organization is "the act of organizing; the state of being organized" (Webster's New Dictionary and Thesaurus 1990). In other words, it is the mechanisms of organization that are important to defining it in terms of society. In this way social organization is viewed as the organizing force behind a society, and it cannot then be relegated to a subsystem of behavior operating within a society. In order to model the totality of a society, both the structure *and* the organization of the society must be subsumed in definition.

2. Society as a Social System

A social system can be defined in terms of both its organization and structure. A system is a holistic entity, and what characteristics a system cannot be determined by describing the attributes of all of its parts (Bertanlanffy 1968:55, 328). The character of a social system is not the sum of its individual features. This excludes the pattern of interaction between these features, which defines the organization of a society. A *social system* can best be understood as the interaction of patterned constraints put upon the network of social relations in a society.

When the features of a society are isolated and synthesized into a model of the "social system," seldom are the interactions among these features *and* the constraint placed upon them(e.g., Radcliffe-Brown 1952). Inquiries such as these disassemble the totality into bits and then fail to reassemble it. Such were the problems faced by the early evolutionists, the diffusionists, and the functionalist "schools" of anthropology.

Most evolutionists were aware of the defects in their procedure (such as Tylor), but it was not until the early decades of the twentieth century that these were fully exposed. The basic arguments against evolutionism showed that social and cultural processes of change could not be thought of as consistent through time and space. It was argued that spatial differences could not be translated into temporal differences without historical data. The line of questioning eventually moved towards trying to explain these discrepancies.

One group of scholars began to focus their attention on the mechanisms that could have brought about changes to society. The diffusionists demonstrated the problems and limitations encountered by the evolutionists through acute criticism and testing. They showed that the "universal" attributes of the evolutionist did not hold up when applied to every culture. For example, if the Bushmen of the Kalahari were to develop bow and arrow technology, this would not automatically elevate them to the stage of barbarism; while the absence of this technology would not relegate the Polynesian cultures back to a stage of savagery (Wolf 1970:180). However, in performing their critiques and testing, the diffusionists became more interested in how the traits came about, rather than the reasons for why they would come about.

The functionalists, on the other hand, were more interested in how the traits studied by the diffusionists meshed together, and how they interrelated and interpenetrated situations in real life. Their questions focuses on how these traits functioned in a "real" cultural situation. The functional school did not reject evolutionism for the same reasons as their North American contemporaries. In general, functionalists agreed that the evolutionists had simply failed to describe what culture or society is. This failure was largely contingent upon sociocultural evolutionism's inability to explain cultural change: i.e., culture or society was not modeled as being in a state of flux. Bronislaw Malinowski provoked a generation of scholars when he argued that social science must first understand the "nature" of cultural phenomena through their function and form before one can intelligently discuss their origin (1935:624). Even Malinowski's strongest opponent, Radcliffe-Brown, agreed that "we cannot successfully embark on the study of how culture changes until we have made at least some progress in determining what culture really is and how it works" (1931:22). Perhaps it is in Malinowski's words where archaeologists dealing with the study of social development can find some direction: how should we discuss the origin of something if we do not yet understand its composition, nature and arrangement?

The strongest contribution of the school of structural-functionalism was to address the question of why cultural change occurs at all, and what factors influence change to happen. These scholars accepted change as a natural phenomenon, and when it does not occur, bizarre and unusual circumstances were used to explain stability.[2]

What the functionalists ended up doing was focusing their attention on stability, pattern-maintaining, and boundary-defining processes involved in society. The major downfall of such an approach was that it put them in a position where they had to explicitly state the facts of change. In order to do this, functionalists stressed that the order and systemics which surrounds their analytic concepts were not actually as orderly or systematic as they just talked about; socialization is an uncertain process and we should expect more occurrences of variations than similarities; role specification is very loose, and even in a highly integrated society, innovations are always probable. This guided the functionalist's view of the social scene where change is "imminent" or "inherent" in society. As Bock (1970:200) has noted, although this "imminent change" can be readily accepted as a general view of social phenomenon, it really provides a poor theoretical explanation for social change. It addresses the idea of process with no solution, nor even an approach. Society must then be a "boundary-breaking" process, rather than a "boundary-making" process. Society then must be seen as constantly destroying what is has just created. However, for all this stabilizing, pattern-maintaining, and boundary-making done by society, it must also actually be a "boundary-defining" process (Bock 1970:200).

The main criticism of the functional approach was that it vastly overplayed the analogy of culture to an organism. In studying the function of cultural traits, it was often over-stressed how these traits fit together. It placed them in a situation where every part in the cultural system contributes to the survival of every other part (Wolf 1970:181). Consequently, the detailed studies produced by this paradigm gave us the idea that societies have an incipient knowledge. This knowledge was quite beyond the individual's capacity to grasp, but collectively and subconsciously molded and shaped the "cultural body" (Wolf 1970:181). However, among American anthropologists, this "mosaic" (Keesing 1981:11-120) composition of culture was tempered by the understanding that the cultures they studied bore some relation to the environment in which they lived, and the presence, absence, and composition of the societies that neighbored them (Wolf 1970:180).[3]

3. Mechanisms of Structure and Organization

If any society is composed of structure and organization, only in different forms, the question remains as to what forces within a society operate to keep these in a state of flux - a state of constant boundary-breaking and boundary-making. Fallers has observed that "[i]nequality appears to be an inescapable feature of the human condition" (1965:237). Perhaps at the core of this issue is the concept of social opposition. Members of a society are constantly in a state of dissimilarity with each other, but not necessarily in a state of conflict as Marx (1948) would propose.[4]

Concepts of power and authority come to the fore when discussing social opposition, and the mechanics of how society is structured and organized. Power, in general, is thought of as "the ability to forcefully compel the behavior of others" (Fried 1965:181), whereas authority is based upon social approval. Authority allows the individual the ability to orient the behavior of others (Fried 1965:181), often through exchanges of gifts or displays geared towards publicizing the individuals sphere of influence. Thus, there are two major differences between power and authority. One contrast is that authority is rarely connected with force or compulsion (Fried 1965:181). The other difference is that one does not necessarily need social approval to employ force. There can be considerable power without social approval or authority (Fried 1965:181).

Power and authority are often viewed as transitory in society. They are objective states of social recognition that a person can occupy or employ in varying degrees, at various times, in various contexts. However, both power and authority extend beyond the range of the individual. As Wolf (1990b) has shown, power, as it has been used in the anthropological literature, is viewed from and defined in four distinct ways. I would argue that authority, although not addressed by Wolf, could be similarly viewed and defined in four different "modes."

As Wolf conceptualizes it, balances of power are always shifting and changing, operating against entropy (1990b:590). Entropy is synonymous with randomness. Power is a principal mechanism employed by members of a society to guard against or combat randomness. However, power can be thought of in four distinct ways. First, power can be understood "as the attribute of the person, as potency or capability" (Wolf 1990:586). Here the individual is recognized as having "power," and perhaps this can be thought of as kind of "kinetic power." On the other hand, power can also be viewed "as the ability of an *ego* to impose its will on an *alter*, in social actions, in interpersonal relations" (Wolf 1990:586). This draws attention to the ability of an individual to have power over another individual, but does not state the context in which this may happen, or how power may be utilized.

Wolf's third mode of power takes context into account, stating that power also "controls the setting in which people may show forth their potentialities and interact with others" (1990:586). By using power in this way individuals can "circumscribe the actions of others in determinate settings" (1990:586). This relates directly to how power is used in organizing social actions, thus Wolf has termed it "organizational power." By controlling the context within which people may interact, the behavior of those individuals can only be expressed in a limited number of ways. Power in this sense, is viewed as an organizational mechanism in society. It simultaneously defines behavioral norms (in-range behavior) from deviant behavior (out-range behavior). This mode of power patterns the interactions among either groups or individuals in a variety of social contexts, in essence, the contexts understood as social features.

However, organizational power is only useful for controlling behavior or potential behavior within a certain context. Wolf has also recognized that power can be used in a way "that not only operates within a setting or domains [the realm of social features] but that also organizes and orchestrates the setting themselves, and that specifies the distribution and direction of energy flow" (1990:586). Here power is not used just to conscript or constrain the pattern of behavior within a certain context, but it is further employed to *create the context itself*. As Michael Foucault has noted, when power is used in this way it can "structure the possible field of actions of others" (1984:428). In terms of society, this "structural power" is the mode by which social structure is formed, maintained, and by which it ultimately changes. Categorically, the social structure of a society is dependent upon structural power, as it is this which "shapes the social field of actions so as to render some kinds of behavior possible, while making others less possible or impossible" (Wolf 1990:428). This mode of power can be thought of in much the same way as Fried attempted to define "the political" in society as the "means whereby society defines its component statuses, equips these statuses with roles, and rationalizes all of the implicated interactions in terms of larger groups rather than in terms of individual's behavior" (1965:183).

B. Studying Society

In the previous sections I have outlined the principle components of a social system, a language that is useful to discuss it, and the mechanisms by which social change can occur. This, nevertheless, still leaves society at an abstract level. As such, an analytical model must still be suggested (cf. Firth 1957). Before proposing the details of such a model (Chapter 4), I would like to comment on outline what has been and must be monitored to understand the structure and organization of a social system.

The study of society is generally characterized by approaches that treat societies as distinct, insular units somehow interacting with other distinct, insular units. Each society is analyzed according to a select group of components. The variables selected for analysis, more often than not, reflect the problem with which the researcher is most interested. Take, for example, the study of gender roles in society. When talking about gender issues, it is often the differences between men and women that are the focus (Sanday 1981). Apparently, differences between males and females, regardless of their age, is not as great an issue.

With analytical models, it is variability that commands central attention. Variability is often regarded as the total range of observable behavior regarding the theme under study. These behaviors are categorized in order to determine and understand redundant patterns of behavior. In the study of society, one example of such a categorizing procedure is the "levels" of society used by the evolutionists (e.g., Morgan), reformed by the functionalists (e.g., Durkheim), and reformed again more recently (e.g., Service, Sahlins). The variations in categorized behavior between societies has played a pivotal role in how the study of social development has been approached. The general conception is that social development is a slow and gradual process (following Darwinian evolution). Arguments for developing social complexity rely on increases in variability. If there is an increase in the range of behavior in a society, or behavior becomes more elaborate, this is equated with an increase in complexity (Brinch-Peterson and Meiklejohn 1995).

There are two basic problems in relying so heavily upon equating variability with complexity. The first is that analyses may generate variability that was not necessarily apparent in the living society. This is otherwise known as idiosyncratic variability. In statistical analyses this is a difficult problem to overcome. This is mainly because one never knows if they are generating idiosyncratic variations. However, as I will show in later chapters, this problem can be kept in check by implementing several measures of redundancy into the analytical model.

The second problem is more theoretical than analytical. As previous approaches to studying society have concentrated upon what certain societies have and what they do not, seldom is the purpose of social behavior taken in to account. This is largely because we feel this encroaches upon the psychology of ancient peoples and their cognitive behaviors, which are felt to be largely untestable (Binford 1981) However, it is possible to understand the purpose of social behavior without being reductionistic or functionalistic.

It has been repeatedly argued (Marshack 1972; Renfrew 1985; Mithen 1990) that those who live in a society share a similar world view - a common cognitive map. It has been argued that these shared views play a major role in promoting innovations and changes in society, technology, subsistence, and so on. In other words, society is geared towards changing and varying its strategies. Seldom does this boundary-defining process have the purpose of creating randomness, or entropy. Disorder is not beneficial to the society in the long-term. In the short-term it may act as the agency of change, but, generally, any network of social relationships is not founded upon the idea of promoting randomness or chaos. Rather, the purpose is to combat this. The selections individuals and groups make in a society form the perspective from which entropy is to be faced.

Wolf has stated that power, which is both a mechanism for change and stability, operates against entropy (1990b:590). I believe authority acts in much the same way, but without forcefully compelling the behavior of others. By employing power and authority in various contexts it is possible to stabilize or alter those contexts. Power and authority are then the vehicles people use to make selections. These selections alter the nature of the society, and change the way the society will face entropy. From an anthropological perspective, we regard this as a social development. We do however often characterize the nature of the new social form by what it once did not have. That is, the society has become more "complex."

Johnson (1978) has noted that social "complexity" increases through two processes: 1) an increase in decision-making units in a hierarchical level; and 2) an increase in the number of hierarchical levels. We should expect, then, the number of groups making selections to increase and, likewise, an increase in the differences between the groups.

It has been argued that by monitoring the information flow within and between these groups, it is possible to understand how the hierarchical system communicated (Shannon 195x). It is through communication that strategies for combating entropy will be expressed to the people involved (symbolically, vocally, or otherwise). I follow others in arguing that studying entropy will allow a basic description of a social system (cf. Wright 1977; Tainter 1978). The benefit of this theoretical premise is that it empowers the researcher to move beyond the practice of classifying social types. It also allows any society to be discussed using the same language. By focusing on how the structure and organization of a particular society acts to impair or enhance the flow of information it is possible to compare societies on the same level. Analytically, we can set what we know about one society against what we know about another.

This is a fine compass for the discussion of societies were information flow is quite visible, such as in modern or even historical societies. However, it remains to be seen how this can be applied to archaeological societies, where entropy is detectable only through material remains. It is to this issue that I turn next.

Notes to Chapter 2

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[1] The original defintion in Aberle *et al.* (1950:101) reads, "A society is a group of human beings [...]," but this does no longer coincide with what is known now about primate and other animal forms of social grouping (such as elephants), so was modified.

[2] Incidentally, it is the recognition of stability, or "stagnation," which formed the evolutionists basis for explaining the "original," "ancestral," or "survival" forms in the present (Bock 1970:199).

[3] This interest in the relationship between culture and the environment later developed into the "cultural-ecological" approach of Julian Steward (1955). Steward inquired about the specific relationships between a particular technology to a particular environment, and the limitations that result from borrowing traits from other cultures. This lead to the study of *acculturation*, where cultural groups were considered in a broader context, including the relationships to other cultural groups that surrounded them.

[4] See Robert Lichtman's *An Outline of Marxism* (1970:185-195. Toronto: Forum House) for a description of Marx's views on class structure and conflict.

CHAPTER 3

THE ARCHAEOLOGICAL STUDY OF SOCIETY

The hunter-gatherers' world had been a world of equals. Braggarts had been ridiculed until they fell silent. Would-be hoarders had been made to feel so uncomfortable, so resented, that valued possessions quickly became gifts and passed like hot potatoes from person to person and band to band. Now for the first time there were places for big men and elites, pomp and circumstance, arrogance and the accumulation and display of wealth. The emergence of complex society, the most radical development in human evolution since the emergence of the family of man from ancestral apes some 15,000,000 years ago, is one of science's deepest mysteries.

John E. Pfeiffer 1977:20

The way many present day archaeologists are approaching the nature of complexity, all known cultures in the world from the late Palaeolithic ones to the present reveal aspects of complexity. To continue on this course would rob us of the value to be derived from the study of complexity in culture as it relates to the processes of cultural evolution. For example if any inequality in the status or rank of individuals within a social system is viewed as an expression of social class or the existence of an elite, then all societies possess classes. Should any society with a recognizable elite or class system be considered complex, than all cultures are complex.

Arthur H. Rohn 1996:1

I. Introduction

If one thing has been learned in the study of both historic and prehistoric societies it is that social relationships have always been "complex." By this I mean that people have always had to relate to others in a variety of roles, based upon a variety of statuses, and none of these relationships have ever been "simple." The unwritten rules of social relationships are never easy to perfect, and almost no one ever does. When, in archaeology, we study the origins of complex society, what we are actually looking for is when societies began to symbolize their relationships in very noticeable, perhaps even monumental, ways through material mediums.

A quick parousal of the papers from the recent Chacmool conference on this subject (Meyer, Dawson and Hanna 1996), shows that the term complexity is too vague and can virtually be defined for any culture. Neither is the evolution of society as simple or as mysterious as Pfeiffer's (1977) popular exposé would lead us to believe. There is in any society an element of individualism, even in egalitarian societies, where certain persons are recognized differently based upon first their birth, and then the actions they make in their life. There is this feature, then, for society at large to recognize accomplishments. In death ritual, this recognition may be as minor as placing an eagle feather in the grave, or may be as monumental as the pharaoh's pyramid. However, only when these accomplishments are recognized symbolically, therefore materially, can we as archaeologists generally begin to understand the intricate and subtle interactions between people in the past. Social relationships are defined and governed by both emotional and obligational ties; sometimes fear, sometimes nostalgia, or economic or kinship obligations. But always there is this recognition of distinctiveness, and also of belonging.

Only very recently in the history of archaeological thought have the non-material aspects of past lifeways been introduced into discussions on prehistoric societies (cf. Trigger 1989:348 ff.; e.g., Hodder 1982a, 1982b; 1982c; 1984, 1986, 1990a, 1990b). The underlying idea in archaeology for many years was that the complexity of distinctions in society must equal a complexity of social relationships. This, in turn, must equal a complexity of social organization, or in the terms used here, the social system. We must be reminded, though, that this is actually the complexity of material distinctions which is thought to equal complex social relationships and characterize "complex society." However, scalar models have not proven to always be the best approach to defining cultural complexity (Cannon 1996; Fogt and Ramsden 1996; Young 1996; Spencer-Wood 1996; Fish and Yoffee 1996).

Analytically, the archaeological study of society has generally been approached by studying three visible units of culture: the individual, the group, and the settlement (McGuire 1983:109). In order to study these social units, three sets of data have been utilized: mortuary remains, settlement architecture and planning, and more recently settlement pattern (McGuire 1984:104; cf. Pullen 1984:44-45). Each of these data are studied for evidence of inequality or heterogeneity, with the assumption being that social inequality leads to the development of a social hierarchy and, at some point, social stratification (cf. Cosmopoulos 1995). In the following sections of this chapter, I will outline the theoretical approaches to the archaeological study of society primarily as they relate to prehistoric Aegean studies. In the process, the discussion will underscore my argument that many of these different theoretical approaches are not so uncomplimentary as their proponents have contended.

II. Archaeological Approaches to Community Organization

A. Society and the Individual

The study of the individual focuses on the relative status of that person in relation to others. The *social personae*, or the individual's social identity or identities which reflect the rights and duties held by that individual during life, is used to measure the degree of inequality between individuals (Goodenough 1965:1,24). This measure of inequality is interpreted as that individual's rank within the social hierarchy relative to others. In other words, it is the bundle of social statuses which that person held during their lifetime.

For the prehistoric Aegean, Renfrew (1972) was the first to identify wealth as a principal hierarchical separator, or a factor by which individuals were socially differentiated from each other. Wealth as a differentiating factor appeared during the Early Bronze Age II phase on the mainland (Pullen 1985:369, Cosmopoulos 1991:290), the Cyclades (Renfrew 1972:370-390; Doumas 1977:55-60, 1987; Cosmopoulos 1991:33), and Crete (Branigan 1970: 128-129; Blackburn and Branigan 1977, 1982; Pullen 1985:81, 102; Cosmopoulos 1991: Appendix 3.5-3.7). From the limited investigation of Neolithic society (Jacobsen and Cullen 1981; Cullen 1985; Demoule and Perlès 1993; Coleman 1977), there is little evidence to indicate any significant social differentiation among either individuals or groups. But there are some grounds for suggesting males and females received differential mortuary treatment (Cullen and Talalay 1995). However, as Greek Neolithic societies have not yet been systematically studied in the way proposed here, some authors still hold to the hypothesis that there should be some evidence of inherited social differentiation, beyond that of age and sex, at least as the Neolithic period draws to a close (cf. Demoule and Perlès 1993).

B. Society and the Group

There has been little agreement as to what should be recognized archaeologically as a "social group. The principal reason for these difficulties lie in how a social group is observed archaeologically. For example, membership in social groups have commonly been based upon the spatial distribution of settlement residence (i.e., a settlement plan). If two or more nuclear families are recognized as living together, this is a social unit defined as a "small community group" (Hayden and Cannon 1982:135). If a settlement shows many of these small social units each living in a different residence, these are termed "institutions," because it is inferred that each may also have religious, economic, or political functions (Hayden and Cannon 1982:135). The last definition, however, is based upon the assumption that each residence is home to an "extended family." By studying settlement architecture and planning (Renfrew 1984:47; McGuire 1983:124), one can infer, at least broadly, the existence of these types of social groups. For example, in the Aegean, the size of residential units (cf. Pullen 1985:372-375), monumental architecture (cf. Wiencke 1989:496), and special function buildings, such as workshops (cf. Wiencke 1989:507), can all act as markers for social groups (cf. Wright 1996). As well, mortuary data can be studied to understand how the formal arrangement of burials represents various types of social groups, such as a moiety (Binford 1971), or other smaller types of corporate groupings (Hayden and Cannon 1982; Pullen 1985:370-371).

1. The Corporate Group

The reason for suggesting certain residence patterns reflect different types of social groupings comes from ethnographic studies of kinship and descent groups. When anthropologists talk of a "corporate group" they are generally speaking of a kinship or descent group that collectively has access to certain valued assets and rights, including both economic and noneconomic holdings (Murphy 1989:118). It becomes increasingly necessary for the group to establish rules stating who has exclusive rights to the corporately held assets, be they land, resources, or even other people. The extended family moves from being an *ad hoc* group defining themselves by a residence preference to being "a formally defined, continuing group with rules of membership and exclusion" (Murphy 1989:118). A corporate group is a very general term, and may be used to designate one or more types of descent groups. The largest descent group unit is identified as a lineage, or a clan, which utilizes a common ancestor to symbolize the social unity and identity of its members, usefully distinguishing them from other groups.[5] If members of a particular descent group live the same area, such as the same village, they are known as a local descent group. However, within a community there may be a situation where two descent groups exist, and this is known as a moiety.

The corporate group has also been recognized as a valuable archaeological unit of study (Saxe 1970; Hayden and Cannon 1982; Pullen 1985:37-42). This is an important advance mainly because it then allows archaeologists to infer the type of social group(s) (lineage, clan, moieties, etc.) which make up a society's structure. As Goldstein (1981:60-61) has shown, the corporate group can be identified through the mortuary record. Goldstein's work focused on the restructuring of Saxe's original hypothesis. This hypothesis states that corporate groups, which control crucial and restricted resources through lineal descent, will maintain discrete formal cemeteries (Saxe 1970:119). However, not all cultures will symbolize their social system in such a way, and Saxe's hypothesis failed in testing. Therefore, Goldstein proposed a modification of Saxe's hypothesis, which takes symbolic variability into account, by suggesting three related testable hypothesis:

1) To the degree that corporate group rights to use and/or control crucial but restricted resources are attained and/or legitimized by lineal descent from the dead (i.e., lineal ties to ancestors), such groups will, by the popular religion and its ritualization, regularly reaffirm the lineal corporate group and its rights. *One* means of ritualization is the maintenance of a permanent, specialized, bounded area for the exclusive disposal of their dead.

2) If a permanent, specialized bounded area for the exclusive disposal of the group's dead exists, then it is likely that this represents a corporate group that has rights over the use and/or control of crucial but restricted resources. This corporate control is most likely to be attained and/or legitimized by means of lineal descent from the dead, either in terms of an actual lineage or in the form of a strong, established tradition of the critical resource passing from parent to offspring.

3) the more structured the formal disposal area, the fewer alternative explanations of social organization apply, and conversely. [Goldstein 1981:61]

This work done by Saxe, Goldstein, and others, now allows archaeologists to do two things: 1) predict the existence of one or more corporate groups based upon the formal, spatial arrangement of burials; and 2) use this to infer the existence of lineal descent groups. By combining what is known of the formal arrangement of both residence and mortuary remains (McGuire 1983), archaeologists can then attempt more specific conclusions. For example, they may attempt to infer what type of local descent group(s) are represented (such as lineages, clans, or moieties), or what type of lineal descent was practiced by the society (such as hereditary lineal descent; e.g., Saxe 1971). Furthermore, with Goldstein's modification, the hypothesis can predict that a group organized by lineal descent will be widely applicable cross-culturally, as shown by Chapman (1981) and Pullen (1985).

How archaeologists study the individual and the group in a society provides the foundation of how they view the society to be structured and organized. Essentially, the

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individual and the group can be seen as the fundamental elements with which a researcher will try to reconstruct the workings of a social system. Unfortunately, in the study of "complex" society, the study of the individual and the group has largely taken a back seat to the study of the settlement. In most studies of social development, it has been the attributes of a settlement, such as the nature of the technology, subsistence practices, or general economy, that has been given centre stage in theories proposed to define the "origin of the state" (cf. Wright 1996 for the Aegean).

C. The Study of Complex Society

The study of prehistoric social development in the Aegean been largely restricted to the Early Bronze Age or later periods (Wright 1996). A precise definition of the settlement in terms of society has been hindered by debates regarding theories about the development of complex societies.

The study of complex society is made up of two ideas which are often difficult to separate. First, "origins of the state" is the term used to describe the field of study that attempts to explain how "the state," or the highest form of cultural and social achievement, originated and developed. This is accomplished by deterring causal links between different "levels" of cultural development. It can be thought of as a "ladder" of development, where the notion of progress is theoretically understood as the mechanism driving the culture up the "ladder." With each step up this ladder the culture becomes more and more complex. This is closely linked with the notion of "cultural evolution." The "ladder" analogy shows that there is some direction to the cultural development, with each step up the ladder representing a significant improvement from the last stage.

To explain why this change takes place, authors have taken two basic theoretical stances (Flannery 1972; Wright 1977). They have relied on either a single "prime mover," one factor that was responsible for the change, or on using several factors to explain why the change took place (Fig. 3.1). Both theoretical stances are evolutionist because they subscribe to distinct stages in social and political complexity in a ladder model (Pullen 1985:7; see also Service 1975; Wright 1977; Yoffee 1979, 1993; Haas 1982).

Elaborate waterworks	Steward 1955; Wittfogel 1955
Integrating power of great religions	Willey 1962
Regional symbiosis and cooperation and competition	Sander1968; Sanders and Price 1968
Technological improvement and economic surpluses	Childe 1951
Monopolistic control of critical resources	Flannery et al. 1967
Environmental diversity and redistribution	Fried 1960; Sahlins 1958
Population growth, circumscription and warfare	Carneiro 1970; Webster 1975
Sociological differentiation	Adams 1966
Trade	Polanyi et al. 1957; Rathje 1971
Risk dividing in agriculture and distribution	Chmurny 1973; Halstead 1992; cf. Yoffee 1988
Population growth	Harner 1970; Smith 1972
Diffusion	Meggers 1975
Psychological variables (i.e., individual motivations for power and dominance)	Service 1975
Cybernetic processes and multivariate causality	Flannery 1972; Wright 1970; Wright and Johnson 1975
Emulation of more "complex" societies	James Wright 1994; 1996
Cooperative models (encompassing more than one of these causal factors)	Renfrew 1972; Renfrew and Cherry 1986

Figure 3.1. *Ideas used as causal factors to explain complex society formation. Source: updated from Athens 1977:354.*

The "prime mover" explanation consists of several complimentary theories. In the Aegean, the diffusionist perspective was used to explain new patterns in the archaeological record by relying on evidence for the introduction of cultural advancements from the eastern Mediterranean (Childe 1934, 1936; Sherratt 1981, 1983). The migrationist view holds that new developments were caused by the arrival of a new population in the area. Changes that occurred in the Aegean from the sixth to the third millennium have been explained by different authorities as due to an influx of populations from the Balkans (Mylonas 1957:27), from Crete, Egypt, and North Africa (Smith 1965), from the Near East with the Ghassul culture of Palestine (Weinberg 1954; 1965), and from Anatolia (Caskey 1964:36; Vermeule 1964:26).

The other type of theory seeks to explain developments in terms of local processes by using a systems model. Renfrew (1972) was the first to systematically use this model for the Aegean. This study has since proven one of the most comprehensive and systematic treatments of the development of social life in the Aegean, and has formed the basis of much current research. In particular, the principles on which the study was based has since fostered many regional studies geared to mapping out local developments, then comparing different regions (see Davis 1992; Rutter 1993). However, Pullen (1985) has noted that there are three fundamental problems with studies of this kind, in particular Renfrew's work, but these reflect general difficulties faced by researchers studying the development of complex societies:

1. a lack of detailed empirical testing within a limited region;
2. adherence to the evolutionary theory of tribe-chiefdom-state succession and to an empirically invalidated theory of the nature of the "chiefdom"; and
3. the use of a systems model as an explanatory device for social change but with the relegation of social organization to a subsystem. (Pullen 1985:3).

Pullen cited this first problem specifically because of Renfrew's failure to explain the differential developments on Minoan Crete and the Mycenaean mainland. This was due to his treatment of Aegean societies as if they were a polyculture little changed over time (i.e. the Minoan-Mycenaean civilization; Pullen 1985:2; Wright 1996:536). Studies of the Neolithic also face this same problem. A paper by Jacobsen and Cullen (1981) of the burials at Franchthi Cave treated their findings against burial customs of the entire Neolithic period. In the same sense as Renfrew, they treated the cultures of the Neolithic as a polyculture, but used only the burial customs of the period. Basically, the did not control for time in their study. As Jacobsen and Cullen noted, this type of study discourages generalization. However, changes in settlement pattern, subsistence, metallurgy, and mortuary treatment over those 3,000 years do suggest a need for a more detailed study (Renfrew 1972; Jacobsen and Cullen 1981; Cullen and Talalay 1995).

1. Approaches to the Origins of Complex Society

Renfrew's principle thesis was that Aegean civilization did not develop by diffusion but rather through a process of internal changes in the third millennium B.C. This is largely why he chose the perspective of systems theory. These internal processes, Renfrew argues, led to the development of the Minoan and Mycenaean civilizations (1972:xxv). Renfrew based his concept of culture on White: "man's extra-somatic means of adaptation" (1959:8; in Renfrew 1972:13), and by using Binford's (1965:203) idea that culture should be studied as a system composed of subsystems. From these ideas he constructed a model for studying Aegean society rooted in five principal, interacting subsystems of an archaeological culture:

1. Subsistence subsystem
2. Technological subsystem
3. Social subsystem
4. Projective or symbolic subsystem

5. Trade and communication subsystem.

Renfrew's concept of systems change is very intrasystemic. He modeled culture as a *closed* set of interacting subsystems. The interactions between subsystems cause growth and change that are explained as being due to a type of positive feedback from within the system. The mechanism of change is a positive-feedback loop that Renfrew termed the "multiplier effect", which he defined as:

> changes or innovations occurring in one field of human activity (in one subsystem of a culture) sometimes act so as to favour changes in the other fields (in other subsystems). The multiplier effect is said to operate when these induced changes in one or more subsystems act so as to enhance the original changes in the first subsystem [Renfrew 1972:37].

These systematic interactions are then left as "explanations" of changes in the system/culture. However, the boundaries of these subsystems and the subsystems themselves are difficult to identify. This becomes particularly strenuous when dealing with "social complexity," as Pullen notes:

> If indeed the principal problem at hand is one of developing social complexity...then modeling should emphasize the social aspect. [T]he social "subsystem" is not a mere subsystem on par with the subsistence or technological subsystems, but it is, rather, structurally a part of the system, a part of the systemic nature of interacting parts. [Pullen 1985:18]

Pullen's point is that Renfrew used this model with the idea that these five subsystems were actually distinct structural parts of the culture, rather than as "activities or classes of phenomena upon which the social system acts" (Pullen 1985:19). Essentially, what Renfrew succeeded in doing was relegating the organizational aspect of society to a subsystem in a case where social organization should have been viewed as the organizing force of the entire system (cf. Chapter 2; Pullen 1985:20).

In this respect, Flannery's model (1972) remains far more workable. In Flannery's version a subsystem is not an actual bounded structure of society, but rather is "the actual control apparatus regulating certain activities among replicated lower order units" (Pullen 1985:19). The subsystems conceived by Flannery are structural units that perform differing activities in the social system, not the actual activities themselves as formulated by Renfrew. In other words, the subsystems, as defined by Flannery, correspond to distinct *social features* in society. These features compose the structure of a society, they are in a state of flux, and therefore, the boundaries which define them are constantly being made and destroyed. This highlights another fundamental problem with Renfrew's model in that it was structurally static. Increasing social complexity does seem to involve a structural and organizational change of the system, and Renfrew did not account for this structural change, and therefore could not adequately model and explain change (Pullen 1985:21).

Other authors have followed a similar systemic approach to modeling the development of the "state." Wright (1977:381) emphasized a centralized decision-making or regulation of activity of the system, rather than groups, institutions, or roles. Wright was concerned mainly with the mechanisms at work in society and how society goes about making selections. As emphasized in the previous chapter, the study of selection strategies does not have to be approached with such a specific focus. Centralized (i.e. formalized) forms of decision-making are not characteristic of all societies, and even if they are present, this formula is not used for *all* the decisions one makes in course of daily activity. A series of small selections can result in change just as easily as the proclamation of a grand edict. As suggested previously, studying decision-making, or selections, is important in studying society, but can be more generally and efficiently modeled by focusing on information flow in a social system.

Wright (1970:8) also argued that the study of state origins must focus upon the analysis of information flow (for him, though, this includes matter and energy exchanges). Information flow is argued as an essential factor in the dynamics of institutional development. For Wright, the major problem in studying state origins was in defining "the subsystem operating in any given case of state development and [devising] some means of measuring the major flows into, within, and between these subsystems during this period of development (1979:8-9).

In this respect, Flannery's article (1972) is very similar to Wright's, in that he identifies "institutions" as the domain where the study of social development should be focused. To Flannery, institutions are seen as the information processors in the society, and they serve to regulate information flow (1972:409-412). Their purpose is to maintain a steady state of information flow. Change comes about if the institutions are not able to maintain a steady state, which causes segregation and centralization of the social system. It follows, Flannery said, that "more highly evolved systems may be less stable" (1972:411). A study by Donald Henry (1989) has recently shown that the Natufian culture of the southern Levant underwent a segregation and centralization process of the kind proposed by Flannery.

Also on the issue of social development, Peebles and Kus (1977:427) noted that the progression from egalitarian societies to more specialized, hierarchical societies is partly due to the development of more specialized, hierarchical regulators (i.e. elements used by the society for mark different hierarchical strata, such as wealth). As Peebles and Kus see it, the major differences between segmentary societies, ranked societies ("chiefdom"), and states are structural and organizational. That is the differences between particular forms of society lie in the degree to which society is structured and organized. For example, the structural units or social features in egalitarian societies are interchangeable. This means that an individual is not greatly restricted to the social setting (context) in which they can show forth their potentialities. However, in more "complex" societies these same units become differentiated to the degree that they are segmented into finer, more distinct groups within the social structure. Individuals would then be operating under a system of more strictly defined social action. Their social field of action is now constrained to a specifically designated range of contexts. This idea is quite helpful if it can be understood, in Peebles and Kus' terms, that a "complex" society allocates a greater number of roles to individuals, and recognizes a greater number of statuses. However, this does not necessarily mean that the society itself, in pure numbers, has to increase in size (scale) as the number of roles and statuses increase (cf. Carneiro 1970; Webster 1975).

In another important contribution, complementary to that of systems theory, Johnson (1978) employed information theory to model the organization and structure of complex administrative organizations. In his study, Johnson observed that these distinct, specialized social groupings (defined by Peebles and Kus) caused increasing complexity. He observed that an increase in the "number of decision-making units at a given level of a decision hierarchy" gave way to an increase in the "number of hierarchic arranged levels" (Johnson 1978:87-88; 1982). In both of Johnson's studies he showed that once a society begins to exhibit a situation where certain groups or individuals (decision-making units) are operating the contexts in which the pattern of social behavior may be played out, the number of contexts increases. Furthermore, as part of this process, any one hierarchical unit will act to create another unit. Often, this new unit will have the pattern of their behavior constrained to such a degree that they will only be able to perform as social subordinates.

Wright, Flannery, and Johnson were concerned with the internal dynamics of system states (i.e., a social system), as was Renfrew when he stated that:

> Changes in culture can meaningfully be explained in terms of the continuous operation of factors within the culture, which are continually interacting [citing Flannery 1969:119]. The explanation then involves the choice of a mechanism, a notion of how these factors interact. [1972:17].

Those who have critized research that monitors social change by as study of the internal workings of an archaeological culture, have been correct in pointing out that "this kind of endeavor will never lead to an understanding of *why* complex social systems have evolved (Athens 1977:359). This is mainly because the theoretical orientation can never predict the evolution of complex social systems (Athens 1977:356). However, if this ever was the purpose of these studies, as Renfrew has denied (1994), they did indubitably fail, but only in part.

The part they did not fail to understand was that the internal dynamics of a system must be made the first priority in the study of social development. In other words, we should first ask "how can we discuss the origin of something, if we do not yet understand its composition, nature, and arrangement"? This is essentially what a study of systems, or interrelatedness, and specifically, the systemics of a society will delineate. What these critics do not like is that a study of a society's composition, nature, arrangement, and organization, does not *explain* how that composition, nature, arrangement, and organization came about. Again, though, this is not the purpose of inquiry. To answer why or how the society is organized and structured in a certain way involves an entirely different level of inference (in archaeology, anyway), and hence, a different body of theory to govern study. This theory (or perhaps groups of theories) must, however, be compatible with the approach to studying social structure and organization. This is because the purpose of inquiry is now to translate the "internal dynamic" information into a context that interprets many "external dynamic" variables acting upon the social system.

Not surprisingly, this has not been the goal of those who are interested in theory building for studying the development of society, or "complex" society. This approach has not ever been considered as the goal of research (for example see Meyer, Dawson and Hanna 1996). In fact, the study of the origin of the state is a specialized field of archaeological inquiry without really any discernible goals whatsoever. Perhaps this is why most arguments surround *what* should be studied, rather than *how* the information relevant to social reconstruction and social development should be studied. In other words, what should be the plan of action to get at the answers that everyone involved wants so badly. The problem is that the questions asked are so demanding that one body of theory simply cannot get at the answer in an adequate way. I argue that several complementary bodies of theory must be utilized to answer even "simple" questions about the development of society.

For example, if one would like to address questions regarding the functioning of agricultural systems and their relationship to the character of "complex" cultural systems, one must first understand what the character of that cultural system is. In an article on this subject, Athens figured that if one could determine how agricultural systems function in terms of intensification and varying meteorological variables, then one can "develop a series of expectations regarding the character of specified dimensions of complex cultural systems" (1977:354). Important to this approach is recognizing that agricultural intensification and meteorological variables call for different strategies by the society, and therefore different social make-ups to create those strategies.

The fundamental flaw in this approach is that one will only come to an understanding of how different forms of agricultural practice relate to how decisions or selections could be made in the society. Decision-making relates to how information is moved about the social system, which is what Wright, Flannery, and Johnson have studied. In turn, the flow of information relates to how that particular society is structured and organized. Social structure and organization are the aspects of society which determine how power and authority operate. Power and authority are the vehicles used to regulate the contexts in which selection may operationally be made and by whom (Wolf 1990a). I argue, then, that Athens' theory may be better employed if a focus is on the different strategies made regarding agriculture under certain environmental constraints. From this viewpoint a society cannot be "pigeon-holed" as "more" or "less" complex based upon the agricultural strategies they employ. In Athens' favour, though, the theory outlined in his article can be utilized to understand the relationship between subsistence strategies and other strategies conceived by a particular social system.

I hopefully have shown here that any discussion of social structure and organization, the mechanisms employed to create and destroy them, and the general patterns of social behavior studied by archaeologists, cannot be adequately understood through categorizing procedures alone. It follows that the problems inherent in the "tribe-chiefdom-state' model (Service 1962) of social development do not *explain* why the change occurred. Rather, this is a categorizing procedure, specifically focused to delineating what elements characterize structural change. Unfortunately, this models is still widely used in the study of Aegean social development (Wright 1996; Comospoulos 1995).

I advocate that the approaches outlined above are not as incompatible as their authors have argued (Flannery 1972; Wright 1977). Instead, these ingenious ideas do work off each other once the basic mechanisms driving society are understood: this being power and authority. In the section that follows, I will address how theory can built around these core ideas of modeling social structure, organization and change.

III. Studying Diversity: Theory Building for Studying Social Complexity

The validity and the use of evolutionary theory in archaeology and anthropology has recently undergone a reevaluation. It has been criticized because it has failed to provide an explanatory framework and because it is not a scientific approach to the study of human behavior (Yoffee 1979, 1988: Cordy 1981; Dunnell 1980). Dunnell (1980) in particular has made it clear that the problems with this theoretical stance lie in three areas: the social philosophy of human progress, the idea of scientific (Darwinian) evolution, and theory construction.

The idea of the social philosophy of progress ("survival of the fittest") was first advocated by Spencer, and was later adapted by other early anthropologists, such as Morgan, Tylor, Marx, and White. Dunnell (1980) has shown that this idea actually has very little to do with Darwin's concept of evolution because it is not founded on any actual scientific theory. This is not to say that the idea of scientific evolution cannot be utilized in the study of culture and archaeology. But, according to Dunnell, we must overcome some very basic epistemological problems, such as the rejection of Spencerian evolution.

Dunnell (1980:84) has proposed three areas where a change of thinking must occur. First, the subject must be conceived of as the investigation of empirical variability rather than the typological approach utilized by cultural evolution. Second, this variability must be understood as continuous rather than being separated from nature and biology. Third, change must be conceived as a selective process rather than a transformative process.

It is Dunnell's third point that commands attention here, as it lies in the arena of theory construction. As the use of cultural evolution has not been founded upon any scientific theory, even the most rigorous of theory construction by those using this perspective has failed at a very basic level. Dunnell (1980:85ff) has proposed utilizing Lewontin's (1974) formulation for the construction of scientific theory. There are three components to this formulation:

1. there must be a completeness of the theoretical system;
2. there must be measurability of the appropriate variables;
3. the must also be standards set to measure against the fitness of theoretical descriptions to empirical descriptions (in Pullen 1985:17).

A. Approaching Social Complexity

In using evolutionary theory and systems theory, archaeologists are trying to determine the "complexity" of a society by determing the complexity of social structure (but not "organization" defined here), or modeling the main differentiating factor in the social hierarchy. As shown above, in approaching this subject most archaeologists have used administrative or control hierarchy to model social disparity. This approach utilizes only a single parameter (or "marker") that may be indicative of the relative status of individuals. However, this may only reflect the role of that individual in one relationship. In other relationships, the roles may be different involving different status which could be ranked on different scales This has been termed by McGuire (1983:100) the "layer-cake" model of social structure, and is integral to cultural evolutionary theories.

The layer-cake model of social structure used by cultural evolutionism is based upon only *one* measure of inequality, and this is similar to Marx's idea that inequality is based upon class (McGuire 1983:100; cf. Rohn 1996 above). This uni-dimensional approach has often viewed social organization as being equal to political organization. Therefore, if one can recognize political differentiation, this directly relates to the *structure* of social organization, or vice versa. In this thesis I follow Morton Fried's argument that political organization should be viewed as a sub-part of the social system (1965:183), unlike Haas (1982) and Pullen (1985:25-26) who believe that political organization deals only with those activities related to the concept of power. As I showed in Chapter 2, this does not have to be the case in the anthropological study of society, and I argue that it also does not have to be the case in the archaeological study of society. If the social system also includes political relationships, ranking, economic relationships, and other types of relationships, it helps define emerging social complexity through more than one set of behavior (i.e. only one of political or economic relationships, or ranking). As well, this perspective does not relegate social organization to a sub-system of behavior in an archaeological society, but promotes it to a major organizing force of the society and the culture.

Because of the narrow scope of the uni-dimensional approach, McGuire (1983) suggested a multi-dimensional approach to the archaeological study of hierarchical social systems. In the following chapter I will outline one type of data that can best be used to investigate the aspects of a social system, how this data can be quantitatively modeled for the purposes of social reconstruction, and how a method to model information entropy can be employed as a means to investigate social structure, social organization, and change in society through time.

Notes to Chapter 3

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[5] There is a difference between a "lineage" and "clan," and this difference lies in how lineages and clans go about identifying their relationship to the apical ancestor, or the person at the top of the common genealogy. Lineages use what is called demonstrated descent to do this. The individual, in this case, must recite all the names of their forebearers in each generation until they reach the apical ancestor. Kottack (1991:106) notes this does not have to be, and rarely is, accurate, but it is only important if the lineage members believe it is. Clans, on the other hand, use what is called stipulated descent to show they are descended from a common ancestor. Using this method, the clan member only has to mention the name of the apical ancestor without reciting everyone in between. In all lineages the apical ancestor is human, and only in clans do we find that an apical ancestor can be a plant or an animal. This is commonly called a totem. Regardless of what the apical ancestor is, plant, animal, or human, it performs the same function in either clans or lineages: to promote group unity and identity.

CHAPTER 4

MONITORING MORTUARY RITUAL

I. Introduction

The modern study of mortuary remains grew out of ideas fostered in the early days of the New Archaeology. This approach to archaeology showed that even the most inaccessible and transitory aspects of extinct cultures could be recovered through careful and clever analysis. Effort was initially concentrated on two main lines of inquiry: 1) using the variability noticed in ceramic assemblages to infer residence patterns after marriage (Deetz 1965; Hill 1970; Longacre 1970); and 2) studying mortuary remains to infer social organization and complexity. However, studies of social organization and complexity were no less controversial than those of residence and kinship. Certain authors, but particularly Binford (1962) and Saxe (1971), even attempted to link mortuary patternings with post-marital residence practices (patrilocal, matrilocal, etc.) or kinship types (matrilineal, patrilineal, etc.), and were rightly criticized (Allen and Richardson 1971). The use of mortuary data itself was never questioned, but the extent that it could be used to talk of prehistoric politics, religion, settlement pattern, household organization, economic cooperation spheres within and outside the community, was argued to be quite limited (Allen and Richardson 1971; O'Shea 1984:1). Although fraught with the problems inherent in transferring theory from ethnographic to archaeological data, the social analysis of funerary remains has become common in the mainstream of archaeological thought. The goals of mortuary analysis have changed little over the past thirty years, but the methods used to realize these goals have changed considerably.

Since the Society for American Archaeology symposium in 1969 (Brown 1971c) a great quantity of archaeological mortuary studies have appeared, and employing funerary analysis in the social reconstruction of extinct cultural systems has been the most common focus (O'Shea 1984:2). However, there is a division on the units relevant for analysis. Most research has concentrated on either the evidence of social differentiation at a single site, or on discerning the social systems at work in a group of nearby sites over time. The theory produced to guide these studies was not really concerned with being generalizable (cf. Renfrew 1984a: Chapter 1). Both have been the issues of contention, but it was how inter-site studies were to be carried out that became the subject of much greater debate (see especially papers in Chapman, Kinnes, and Randsborg 1981).

Formal theory for the study of mortuary data, then, remained fragmented and governed by personal preference (Tainter 1978) until studies began to compare the results of an ethnographic analysis of mortuary practices to the archaeological analysis of the same culture's mortuary remains. For example, O'Shea's (1984) study is particularly important because it establishes a bridge between ethnographic studies of mortuary customs and the archaeological study of mortuary remains.

In the following section, the body of theory that can be utilized to manage studies of mortuary remains is discussed. No claims for originality are taken here, as these ideas and governing principles are drawn from the current body of knowledge.[1] Nevertheless, several of these ideas have been modified or amended in considering the cultural system to be studied and the variety and state of the remains being addressed.

As well, keeping in theme with previous chapters, an attempt is made in the following pages to align two theoretical and methodological approaches for the study of mortuary ritual by following Lewontin's (1974) formula for theory-building. The procedure I propose to employ in the analysis of social distinctions in the mortuary record can be termed a multi-dimensional approach. This method focuses on attributes in the mortuary treatment that act to break up the population into identifiable sub-sets, or social *dimensions*. These sub-sets are identified on the basis of both quantitative and spatial parameters. The basis and advantage of the method is that it provides a formal structure for the study of mortuary ritual in an archaeological context. It describes mortuary variability and provides a means to relate certain types of variability to particular kinds of social behavior. This approach follows Lewontin's first criteria by proposing a complete theoretical system.

In order to model and explain mortuary variability, we must make explicit principles that aid in providing a description of the variability, what constraints are put upon the variability, and the ways through which this variability will be expressed in the archaeological record (O'Shea 1984). The first section of this chapter outlines the classes and categories of observable archaeological data through which mortuary variability can be observed. The following section outlines formal principles of analysis that can provide a description of the basic constraints affecting mortuary patterning, essentially providing a description of the variability. These two sections meet Lewontin's second criteria: that the appropriate variables be made explicit and that they be measurable.

The final section describes interpretive correlates that have been developed in mortuary analysis that can be used to explain variability. These correlates act as theorums, they can be deduced as hypotheses and tested, and can therefore later be incorporated into the general analysis as theorums in a formal sense (cf. O'Shea 1984). These, essentially, are the standards which the fitness of theoretical descriptions can be put against empirical descriptions, or Lewontin's third criteria.

II. A Formal Structure for Mortuary Analysis

The formal structure is composed of two parts: 1) an orderly method of recognizing and organizing mortuary data from the archaeological record; and 2) a set of theoretical assumptions that provide the researcher with a way of recognizing distinct structures in mortuary variability.

A. Categories and Classes of Archaeologically Observable Mortuary Variation

The purpose of the categories and classes is to describe several general kinds of data that would best be observed by archaeologists in a mortuary context. These have been proposed in different forms (Sprague 1968; Binford 1972; Goldstein 1981; O'Shea 1984), and the list I use is derived from a synthesis of previous research. The following list, however, is expressed in more detail than earlier versions because I feel the variables acting upon a mortuary program should be made explicit.

There are six categories of mortuary data where variation may be observed: 1) biological, 2) preparation and treatment, 3) the mortuary facility, 4) the furnishings or burial gifts, 5) locational variability, 6) and environmental data (Fig. 4.1). Each category is composed of smaller bits of archaeological data, or classes. These classes act as independent variables in later analysis. This is why it is useful to express them in detail, in order to take into account all the probable mortuary expressions.

CATEGORIES

- → Biological
- → Mortuary Facility
- → Preparation and Treatment
- → Burial Goods
- → Spatial Location
- → Environmental Information

Figure 4.1. *Categories and classes of archaeologically observable mortuary variation. Source: based on O'Shea 1984:Table 3.2.*

1. The *Biological* category includes such elements as the demographic factors of age and sex, dietary information, skeletal pathology, and circumstances of death.

2. *Preparation and Treatment* describes how the body and the grave were prepared. It includes variables relating to the disposal type and the disposal program. The *disposal type* includes such factors as the form of interment, the form of the disposal area, body posture, body orientation, pattern of bone association (scattered, articulated, etc.), and minimum number of individuals (or MNI). The *disposal program* is separated into two parts: the *pre-interment treatment*, and the *burial scenario*. When discussing the pre-interment treatment we must take into account practices indicative of "secondary" burial (specific mortuary treatment then final interment). These include such practices as defleshing, cremation, ritual mutilation, exposure, partial interment, and exhumation and reburial. Second, attention must be paid to the burial scenario, be they single interments or multiple burial scenarios.

3. The *Mortuary Facility* category deals specifically with the *tomb* or *grave* itself. It includes such variables as type, shape, dimensions, orientation, and structural enhancements (such as coverings, doorways, etc.). If the facility is more elaborate, we must also consider specific design and construction practices and techniques, while always bearing in mind the raw materials used.

4. The *Furnishings/Burial goods* category provides information on the variety (or typology), quantity, quality, and source of goods if possible. It may also be useful to separate, or distinguish between 1) intentional grave inclusions (implements and furnishings) and 2) incidental inclusions (clothing ornamentation).

5. *Locational variability* takes into account three levels of location. Measured at the *macrolevel* is the disposal area in relation to the settlement or other disposal areas. The *mesolevel* is a unit to describe the variation within the confines of a single disposal area, such as a cemetery or house floor. The *microlevel* can be used to measure the relationships within a single disposal unit, or a grave (for example, the variation in spatial relationship between the grave goods and the body).

6. *Environmental* information comes from entomological, botanical, and faunal sources. This type of data is rarely used, and is especially difficult to employ if trying to recapture information from dated sources, simply because it was not collected.

This is only one way of organizing the sources of variation visible in the archaeological record. Regardless of their arrangment, these variables represent a basis for the study of mortuary variation (O'Shea 1984:41). However, when faced with actual mortuary data often not all the categories or classes of information can be found (i.e., were not recovered). This occurs due to several reasons, such as pre- and post-depositional effects, or non-systematic or non-problem oriented approaches to excavation (Fig. 4.2). Regardless of the reason, this makes it essential to break down the categories once again. There are two reasons for this reduction: 1) lack of detail in the excavation record, due to those factors just noted above (and Fig. 4.2); and 2) any particular attribute or class (such as demography) of observable mortuary ritual does not provide all the potential information itself, but must also be taken in context with all of the other attributes relative to it (O'Shea 1984:41). This final breakdown forms the irreducible basis for the study of mortuary remains.

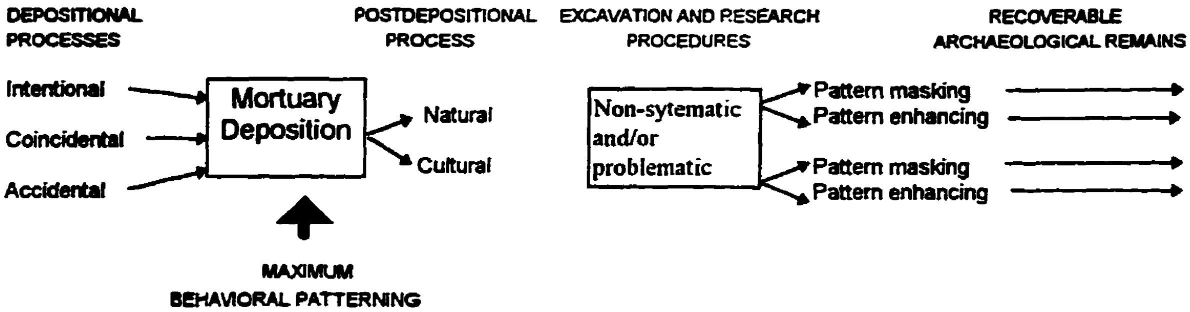


Figure 4.2. The transitional processes between the funerary activity and what may be recovered archaeologically from that activity. Source: O'Shea 1984: Fig. 2.1.

At this point, it is important to note Taylor's (1969) emphasis on the importance of *affinities* in archaeological research, as archaeological data essentially "[...] consists of the material result of cultural behavior, and the affinities- quantitative, qualitative, spatial, etc.- which can be found to exist among them, and between them and the natural environment (1969:112). The concept of affinities is particularly important to the study of mortuary remains, as O'Shea (1984:41) points out, because we are not really interested in the presence of only one attribute, but how the occurrence of many attributes are structured to produce a certain mortuary patterning. However, we are, at present, unable to observe the patterns produced by *all* the affinities. But, due to the work that has been done on discovering the common constraints put on mortuary variability, we can specify a smaller set of attributes, called *primary affinty categories*, which are composed of their *primary* *referents* (Fig. 4.3). Using the primary categories, we end up with the minimum constraints put upon mortuary variability by a society. This includes information on the age and sex structure, frequency, how certain attributes extend throughout the data matrix (pervasiveness), source of materials, and the spatial properties of a disposal area.

CATEGORIES
→ PRIMARY AFFINITY CATEGORIES
- → ***Demographic***
  - → Age constraint
  - → Sex Constraint
- → ***Physical***
  - → Pervasiveness
  - → Frequency Distribution
  - → Sources
- → ***Spatial Pattern***
  - → Macrolevel
  - → Mesolevel
  - → Microlevel

Figure 4.3. *A schematic representation of the primary affinity categories and their primary referents. Source: based upon O'Shea 1984: Fig. 3.2.*

This smaller set of attributes are useful because they are fundamental and perform two main functions: 1) they describe critical aspects in the observed mortuary patterning; and 2) they are relevant to the social differentiation being expressed through mortuary behavior (O'Shea 1984:42). Perhaps most importantly, these primary affinity categories allow any element of mortuary ritual to be monitored and described in an objective manner. When they are combined it allows the researcher to 1) describe the symbolic function of many attributes used in the mortuary ritual; and 2) make inferences on the structure and complexity of mortuary differentiation that produces the mortuary behavior

(O'Shea 1984:43). Practically, this allows a researcher to describe the elements of social organization in terms of what is observable in the archaeological record. Therefore, theoretically, one can submit the observed patterns of mortuary differentiation as descriptions of units (social features) of a social system.

B. Principles of Constraint for Mortuary Analysis

When dealing with any particular type of data, archaeologists must always work with some set of theoretical assumptions. These conventions serve the investigator by providing a framework within which to understand the capricious nature of the data. Several principles (made explicit by O'Shea 1984:33-39), can be assumed to structure the variability noticed in mortuary data. The benefit of making the principles explicit is that it brings into the open the minimum constraints that can be put upon the mortuary variability by a society (O'Shea 1984:33). For example, Clarke (1972:5-6) referred to such principles as *controlling models*, and Binford (1977:6) proposed that an elaboration of such principles be used for middle-range theory. In this section, a summary of those factors which reflect the minimum inhibitions placed upon the expression of mortuary ritual are given. These basic principles provide a logical foundation upon which analysis can be firmly established.

> *Principle 1.* All societies employ some regular procedure or set of procedures for the disposal of the dead.

The first principle is based upon the "assumption" that all humans die and that society must eventually confront death, either emotionally or physically, or both. That is, the society must deal with the emotions that surround the event of death, such as the apparent social disruption surrounding death (Malinowski 1955:33), and they must deal with the disposal of the dead.

Although based on a very solid assumption, the principle must be further qualified. First, the treatment accorded an individual who is not a member of the society may differ altogether from those who are. As early as Kroeber (1927), and later emphasized by Peter Ucko (1968:273), we have been warned of the great variability in mortuary customs within a population. Even heeding this warning, what is most important to this principle, however, is that "at any given moment burial practices *may* in some way characterize particular societies" (Ucko 1969:275). There are ample ethnographic and archaeological examples to demonstrate that the treatment of those outside the society are accorded different mortuary treatment (for example, Rouse 1948:560; Saxe 1970, 1971).

Second, for certain cultural groups the disposal of the dead may reflect more the departure of the social individual rather than the irradication of the physical remains (O'Shea 1984:34). This notion is related to Hertz's (1960) idea that those who are full participants in the living community must be given the appropriate rites to sever the relationship with the community once they are dead. In this way society integrates the individual of the "visible society" into the community of the dead, or the "invisible society." In these terms, mortuary ritual is understood as the final *rite of passage* that must be endured by the individual. Rites of passage have been shown by Hertz (1960), van Gennep (1960), and Leach (1982) to be a near-universal characteristic of societies. It is the main mechanism used to promote an individual from one status in society to the next

(Leach 1982). Rites of passage are prohibitive rituals insofar as they act to exclude participants from the community in the process of ritual. During life the process utimately incorporates that individual back into society, but in death one is forever excluded from participation in the living society.

Lastly, there may be a temporary cessation of mortuary practices due to catastrophe or mass death. Radical change in mortuary practices of this type, characteristically temporary in nature, are no longer considered to be due to changes in "beliefs." For many early authors, from Tylor (1871) to Kroeber (1927), mortuary practices were endowed with great stability. Change in these practices were only attributed to change or variability in beliefs (Binford 1971:13).

This principle prescribes a regular procedure for the disposal of the dead. It views the range of mortuary behavior only as a result of human cultural behavior, but provides a necessary basis for the elaboration of further principles.

> *Principle 2.* A mortuary population may exhibit demographic and physiological characteristics reflecting those of the living population.

As O'Shea stated it, this principle is based on a demographic principle which predicts that an identifiable age and sex structure will be produced by a living population with known rates of fertility, mortality, and growth. Such calculations have, for example, been undertaken by Arthur Saxe in a social reconstruction of a Mesolithic population at Wadi Halfa, Sudan (Saxe 1971:39-57). Saxe's analysis, as well as this principle, is based on the fact that there are fundamental regularities in the patterns of human mortality, which can be detected in a sample of an expected living population (O'Shea 1984:34).

Based upon this regularity, it is possible to detect major deviations and variations in a sample of the expected population through various measures (Jackes 1988; 1994).

However, this principle, as stated by O'Shea (1984:34), does not in itself hold true of all mortuary populations. In a recent paper, Jackes (1994) has made clear the limitations placed upon palaeodemographic research. The general state of the remains and the bone elements used to figure the age and sex structure of a population are of central concern. Difficulties in samples may lead to several problems, such as the ages of adults and children not being accurately known; dealing with a short time-span may lead to unrepresentative figures; and not everyone in the living population may be represented by the figures (Jackes 1994:161). Given these consistent problems facing palaeodemography, physical anthropologists have been led to produce a broad picture of demographic profiles and demographic change, rather than focus upon details (Jackes 1994:161). Following Jackes' cautions, such procedures will be employed when dealing with determining the age and sex structure of the Neolithic populations under study (cf. "Methodology" below).

> *Principle 3.* Within a mortuary occurrence, each interment represents the systematic application of a series of customary (prescriptive) and prohibitive (proscriptive) directives relevant to that individual.

Following from Principle 1, which asserts there is a regular procedure for disposing of the dead, Principle 3 advances the concept that the treatment given any individual in burial will be linked systematically to the treatment received by other members in that society. As burials are a cumulative record of the repetitive normative and differential mortuary action by a culture (Peebles 1971:69), it is assumed that a single set of directives are producing the observable cumulative sample regardless of how "complex" they seem. No rationale for the behavior is explained by this principle, except that the behavior is regularly applied and defines the parameters of mortuary treatment practiced by the particular society (O'Shea 1984:35).

Although social differentiation may be inferred from the regular pattern of mortuary behavior, we must be aware of the limits we can infer through such differentiation in the data. For example, the investigator may not be able to observe the total range of a society's mortuary behavior (O'Shea 1984:35). Ethnographic studies have taught archaeologists that individuals of particular status are accorded radically different types of disposal, such that they may not be discovered by the archaeologists, or if discovered, may not be recognized as part of the main mortuary manifestation" (O'Shea 1984:35; cf. Ucko 1969).

Further, cultural drift may cause a gradual change in either the meaning of disposing of the dead or in the way the dead are disposed of (Binford 1963[b]). In the absence of an acute micro-chronology, these effects on mortuary practice may make disposal appear more complex or show more than one mortuary manifestation. Therefore, the degree of idiosyncratic variation must be confronted by the researcher. The regular patterning must be determined and the variation permitted in the pattern must also be identified. The degree of variation allowed in the regular pattern can itself provide an informative indicator of social consensus and control (O'Shea 1984:36).

> *Supposition 3a*: The nature of the society will pattern and circumscribe the practices for the disposal of the dead.

Ethnographic studies suggest at least two further relationships. The first is presented here as Supposition 3a. This premise was formulated by Binford (1972:235) and lays emphasis on the interdependence of social structure and mortuary practices. It refines Principle 3 by noting that the directive of disposal is not an independent variable in the cultural system in general. This does not mean that there is an equal 1:1 relationship between the two phenomenon, with a particular type of funerary practice and behavior being particular of only certain types of societies, but does not exclude that this may occur in a limited way.

> *Supposition 3b*. The specific treatment accorded an individual in death will be consistent with that individual's social position in life.

This proposition derives from the work of Saxe (1970; 1972), and attempts to further specify the relationship between the disposal directives and the society as a whole. It targets the constraint affecting the decision-making process that differentiates individuals by disposal directives. This premise asserts that observed differences in the mortuary record will be consistent with the real social differences in life, but does not imply that all of these social differences will be 1) observable in the mortuary record; or 2) given symbolic recognition by means of mortuary differentiation (O'Shea 1984:36). For example, the circumstances of death may far outweigh the treatment accorded the individual's interment. Particular circumstances, then, may govern the disposal directive, and the individual will be given varying mortuary treatment according to that circumstance.[2]

The purpose of Principle 3, and its corollaries, is to define the relationship between archaeologically observable mortuary behavior and the organizational aspects of society by stressing the interdependence of variables in a social system. It accomplishes this objective by delineating a relationship between 1) the archaeological remains and the society's procedure for disposal of the dead; 2) society in general and its particular mortuary practices; and 3) the specific mortuary treatment accorded the individual and their social position in life (O'Shea 1984:36).

Using this formal structure it is possible to describe the variability and differentiation observable in a mortuary context. This formal structure does not explain the variability and differences, but allows several modeling procedures to be applied to the data. These can be used to explain the variability and differentiation in terms of various social behavior.

C. Inferring Social Differentiation from Mortuary Remains

In this study, funerary differentiation serves as a basis to evaluate the behavior of social differentiation from spatial and temporal variation in mortuary practices. To isolate structural and organizational differentiation in a social system, two social distinctions have been targeted in previous research. These are descent group differentiation and rank differentiation. In this thesis, I will address both of the types of distinctions, but will concentrate attention on the second. The fundamental reason for this bias is because rank differentiation can be detected through a variety of techniques, whereas determining descent group differentiation is more limited. Descent group differentiation is invariably linked with socioeconomic group membership, and analysis is based primarily on spatial factors. Mortuary analysis can be studied to understand how the formal arrangement of burial represents social groups, such as a moiety (Binford 1971), or a corporate group (Saxe 1970:119; Goldstein 1981; Hayden and Cannon 1982; Pullen 1985:370-371). On the other hand, rank differentiation has benefited from several approaches. The major problem with most of these approaches is that they were based upon the study of ethnographic and not archaeological data. Therefore, they did not take into account the relationship between the social system and mortuary differentiation as expressed in the archaeological record (O'Shea 1984:12). However, two techniques have successfully been utilized specifically for archaeological data. These techniques are useful because they can isolate and quantify rank differentiation, therefore yielding reproducible results through testing.

The formal theory outlined in the previous section allows for a description of the variability and differentiation that can be noticed in a funerary population. However, it is still necessary to explain this variability and differentiation in terms of various social behavior and how the social features can be modeled by archaeological occurrences. The process of interpretation further involves two essential components: *behavioral correlates* and *social modelling*.

1. Social Modelling: Dimensions of Social Distinctions

The interpretation of mortuary data proceeds by comparing the observed patterns with idealized patterns produced by similar types of social differentiation (such as those produced by ethnographic sources; see O'Shea 1984:64). This involves considering the *dimensions of social distinctions*, first introduced by the sociologist P.M. Blau (1970). There are two great advantages gained in considering this idea. First, these dimensions represent the sum of the possible distinctions that can be made, and second, this approach allows the production of information that is *comparable* (Tainter 1978:122).

In any social system there will be at least several dimensions of social differentiation detectable, regardless of how complex the society is (Tainter and Cordy 1977:96). There are three dimensions of social distinctions that can be abstracted for the analysis of social structure and organization: *vertical* social differentiation, *horizontal* social differentiation (Tainter 1977),[3] and what can be termed *special status distinctions* (Table 4.1). These dimensions compose the structure and organization of social systems.

Vertical social distinctions are characterized by the unequal ordering of social components (i.e. the primary referents described above) at each hierarchical level, and clearly refer to the structure of rank grading within a society (Tainter 1977:96). *Horizontal* social distinctions are characterized by ordering (of variables) based upon the individual's age, sex, and *social persona* (Goodenough 1965), or the roles people are expected to exhibit for any given social interaction (cf. Chapter 2). Therefore, the structural components of the social system are equal at each hierarchical level (Tainter

1977:96). *Special status distinctions* are reserved for those peculiar, non-normative mortuary treatments, which show radically different strategies from the normal variation.

	DIMENSIONS OF SOCIAL DISTINCTIONS		
Referent Value	**Vertical Social Differentiation**	**Horizontal Social Differentiation**	**Special Status Distinctions**
Age/Sex	skewed distribution	normal distribution	variable
Frequency	hierarchical pyramid	variable but equal size	low level of occurrence
Spatial distribution	unlikely	likely	likely
Means of Symbolic Designation	differential energy expenditure in treatment and grave goods	equal levels of energy expenditure; use of non-valued symbols	non-normative treatments; low levels of energy expenditure

Table 4.1. The dimensions of social distinctions showing the expected configurations for referent variables in each major category of the dimensions. Source: O'Shea 1984: Table 4.3.

2. Behavioral Correlates

Behavioral correlates is a term used by Schiffer (1976) to specify hypotheses that relate certain types of variability to certain types of social behavior. Behavioral correlates (Schiffer 1976) act as a pattern of expected attributes reflecting material behavior which can be used to provide a detailed structural description of attributes that would characterize certain social membership (social behavior); i.e. they aid in translating material behavior into terms of social behavior. Beyond the spatial correlate of Saxe (1970) noted above for determining corporate group membership, two further central behavior correlates will be utilized in this thesis, but to test for rank differentiation.

First, I will use a distribution pyramid (or hierarchical pyramid), a common model used in mortuary analysis (cf. Braun 1979; Peebles and Kus 1977). This model is based upon the distribution of grave good frequencies and associations (Binford 1963; Stickel

1969). The premise behind this is that certain mortuary treatments using certain social symbols refer to different statuses, and these positions are of successively higher importance. These positions are held by a progressively decreasing number of individuals, and one ends up plotting a pyramid of specific social rank categories (Fig. 4.4).

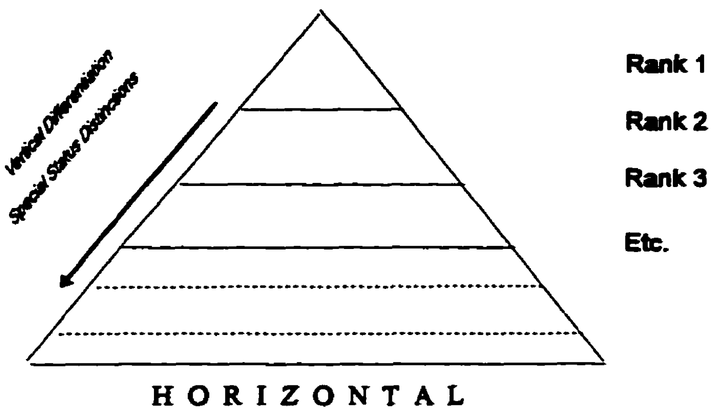


Figure 4.4. Typical distribution pyramid with dimensions of social distinctions and rank designations. Those holding a respective rank position decreases as the pyramid reaches the apex.

The second correlate to be used in the analysis of rank will involve a measure of the different levels of energy expended in the mortuary treatment. For determining the symbolic designations given individuals and groups in a mortuary population, energy expenditure has proven a useful analytical variable (Buikstra 1972; Brown 1973; Peebles 1974; King 1969; Tainter 1973, 1975a, 1975b, 1976, 19777a, 1977b; Tainter and Cordy 1977). This correlate was first used in terms of reconstructing a social system by Tainter (1975a), which has proven a powerful concept because one can quantitatively describe the effort given an individual's mortuary treatment. The notion of measuring energy expenditure for determining rank differentiation is grounded in systems theory and based upon premises made by Arthur Saxe (1970) and Lewis Binford (1971). Saxe (1970:6) noticed that the occasion of death calls for the participation of individuals who had entered into relationships with the deceased. Further, Binford (1971:21) noted that two general components of social significance which aid in structuring the form of mortuary ritual are the *social personae* and the size and composition of the social unit which endorses certain status responsibilities to the individual (cf. Tainter and Cordy 1977:96-97). Binford (1971:21) proposed that individuals of higher rank would be entitled to greater corporate involvement in their interment, and therefore would cause a greater degree of disruption in the community for conducting the mortuary ritual. The premise for measuring energy or labour expenditure was expanded by these ideas, stating that

> we may observe that both the amount of corporate involvement, and the degree of activity disruption, will positively correspond to the amount of human labour expended in the mortuary act. Labour expenditure should in turn be reflected in such features of the burial as size and elaborateness of the interment facility, method of handling and disposal of the corpse, and the nature of the grave associations. [Tainter and Cordy 1977:97]

These observable levels of energy expenditure are understood to reflect the existence of a corresponding structure of rank grading in a society (Tainter 1977a:331), as it is assumed that the archaeological evidence of energy expenditure in a mortuary treatment has a direct relationship to the hierarchical strata which the society is divided into. Using this correlate, it is possible to attach specific meaning to the patterns observed in a funerary occurrence. Perhaps most important to a study such as this, is that a measure of differential energy expenditure is useful for comparing ranking systems at different sites in both space and time.

In general, these correlates are useful because they permit specific meaning to be attached to a pattern of variability. In this context, what correlates do is act as an expected configuration of attributes in mortuary ritual to provide a link to the observed configuration of attributes. As such, they tie hypotheses of *social distinctions* with *symbolic social distinctions*, such as moiety membership (Binford 1964) and hereditary social ranking (Braun 1970; Peebles and Kus 1977). What is important to this combined procedure is that a pattern of attributes (not a single attribute) is used to test for a particular type of social distinction.

The significance of using the formal structure and the two correlates is that they provide an understanding of social structure and social organization by directly referring to the pattern observed in the mortuary assemblage. O'Shea (1984:48) has outlined the advantage of working with a predicted structural arrangement of the mortuary variability. Using this approach, it becomes unnecessary to determine beforehand which particular attribute or set of attributes will function symbolically in any given set of mortuary data. Therefore, it is possible to state that a certain class of artifacts, for example, will be distributed in a particular manner. This, in turn, can be used to isolate a specific sub-set of the mortuary population (as did Peebles and Kus 1977:431), making it possible to test for any potential type of social distinction that may be differentiated in a mortuary sample (O'Shea 1984:48).

III. Methodology: Quantitative Modeling Procedures

The *first* objective of analyses is to generate information relevant to understanding the four distinct aspects of Neolithic mortuary remains: 1) mortuary differentiation as an expression of social distinctions within the living society; 2) variation and change within a society's funerary treatment of the dead through time; 3) variation and change within the funerary treatment of contemporary societies; and 4) the overall patterning of social distinctions throughout the Neolithic period by intersite comparisons. This objective necessitates a *second* purpose of analyses, which is to translate the observed mortuary rituals into the language of a social system. This will be accomplished by studying the mortuary remains in terms of social individuals and social groups. The *third* objective of analysis is to determine the spatial and temporal trajectories of social development in terms of social status, ranking, organization, structure, and social efficiency. The modeling of mortuary remains as social information must focus on four primary variables, or referents, that characterize the three dimensions of social differentiation: 1) the age and sex structure; 2) frequency distribution; 3) spatial distribution; 4) and the means of symbolic designation (cf. O'Shea 1984:48). For each dimension a specific configuration of these variables is expected (see Table 4.1).

The search for patterns in the data involves primarily statistical operations. The statistical analysis of mortuary data involves two principle procedures (O'Shea 1984:65): 1) discovering relationships within a body of data; and 2) evaluating the significance of these relationships.

A. Monitoring Mortuary Differentiation and Social Distinctions

The basic elements needed to monitor mortuary differentiation and social distinctions are the *primary affinity categories* composed of their *primary referents*. As described above, these main categories include demographic or biological, physical, and spatial information.

1. Modeling Biological Information

The biological information available on the skeletal population (or "analytical individuals") present at the site is used to describe the demographics of the population. This can be done through two methods. The first method evaluates the sex and age structure of the population by determining the frequency and distribution of age and gender in the population using the MNI (minimum number of individuals) calculated for the site from complete and incomplete (bone scatter) skeletal remains.[4] If this information is relatively complete, then it also is possible to determine the mortality rates for the population.

The second method involves judging if the collected age and sex data conforms to what would be the normal age and sex distribution for a population, by comparing it with others of the same time. One solution to the comparative problems noted by Jackes (1988; 1994; and discussion above) is to treat adults (>20 yrs) as a group (1988:144). Pooling the adult population in this way navigates the problems noted by Jackes (1988:143), and allows calculations of the probability of death. This comparative procedure is executed by plotting the regression of mean of child mortality for the population (5-20yrs) against the ratio of juveniles (12/13-18/22 yrs.) to adults (18/22-50/60 yrs.). These calculations may also be used to compare a particular site to archaeological, historical, and modern examples (as did Jackes 1986; 1988).

2. Modeling Physical Information: Artifact Occurrence

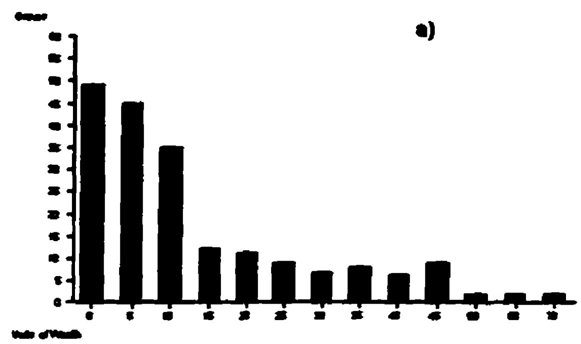
Determining the occurrence of artifacts at a disposal area is done using the information on burial gifts. Three types of information *must* be determined about the burial gifts. These include:

1. a typology of the artifacts (composed of *n* number of elements [artifacts]). Typologies are arbitrary and serve only place the nature of the artifacts in line with the objectives of the study at hand.
2. frequency of the artifacts; and
3. distribution of the artifacts;

Artifact associations are determined by plotting the frequency (2) and distribution (3) of the artifacts according to the age and sex distribution of the population. Conclusions are then derived from the statistical determinations carried out in the last step.

a) Frequency Distribution Analyses

Frequency-distribution analyses are often used to infer the status of individuals based upon differential access to resources, or wealth. Authors such as Randsborg (1974), Shennan (1975), Peebles and Kus (1977), and Frankenstein and Rowlands (1978), have all made use of calculating frequency distributions. The procedure involves creating a numerical index that reflects the wealth and/or status of the population being studied. The modeling of frequency distribution involves calculating the number and nature of funerary offerings in each grave and plotting a histogram. As in the example from Branč (Slovakia) shown below (Shennan 1975; see Fig. 4.5), the histogram shows the number of graves that have a certain number and range (of types) of artifacts. These are expected to take a different configuration for each dimension (Table 4.1).



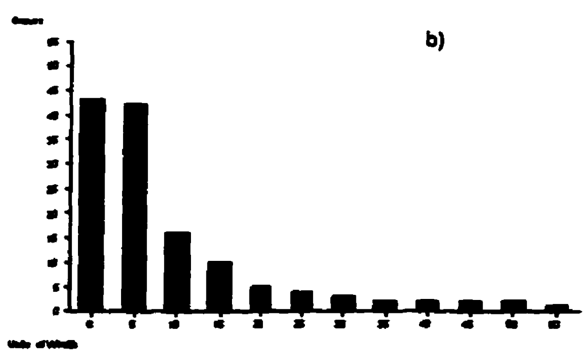


Figure 4.5. Wealth scores for the graves at Branč (after Shennan 1975). (a) Histogram of the raw data. (b) A Pareto distribution applied to this data, yielding a theoretical distribution for the observed scores. Source: Orton and Hodson 1981:105, Fig. 2. Raw data: Orton and Hodson 1981:111.

However, some problems with this method have been noted by Orton and Hodson (1981). Most important of these is that no null distribution is given to compare against the histogram. The idea behind using frequency distributions is that individuals can be assigned to "states" of wealth or status (such as 0, 1-5, 6-10, etc.). The individual can move from one state to another, and the score is the state they occupied at the time of their death. The state is the value of goods they possessed at that time and not the sum total of their wealth. Unfortunately, assigning "states" to the data creates discontinuous wealth levels. These form barriers because they prevent measures of movement from one state to another. Orton and Hodson suggest using a Pareto distribution to provide a null distribution, therefore reflecting a situation where there are no barriers and, thus, a hypothetical equilibrium distribution (1981:106; see Fig. 4.5b).

The Pareto algorithm essentially is a smoothing procedure, that sorts complicated distributions (a sorted historgram). The procedure measures the difference between the observed distribution (the histogram) and the theoretical distribution (the null distribution or sorted histogram). The fitted Pareto distribution is given by the formula

$$F(x) = 1 - \left(\frac{a}{x}\right)^{\theta}$$

(Orton and Hodson 1981:108),

while a and Θ can be varied and computed independently by the statistics package used for the analysis (Orton and Hodson 1981:108). The observed distribution is given by $F_n(x)$ and the theoretical distribution by $F(x)$.[5]

To examine the fit between the observed and theoretical distribution, the Kolmogorov-Smirnov statistic can be used because it is best when looking for small deviations. The Kolmogorov-Smirnov statistic (D_n) measures the greatest difference between the observed and theoretical distribution. Expressed mathematically, the statistic is given by

$$D_n = \sup_x | F_n(x) - F(x) |$$

(Orton and Hodson 1981:108).

It is only necessary to search for deviations when dealing with large amount of frequency-distribution data, such as when hundreds of graves are being analyized. None of the mortuary samples used in this thesis are that large, so the detection of small variations is not needed. The purpose for conducting these tests is to see how the number of status levels derived from the frequency-distribution analysis of grave goods correlate, if at all, with the levels derived from the analysis of the energy expended in mortuary treatment. One analysis targets status differentiation and the other rank differentiation. When the results are combined, it is possible to detect finer status distinctions within a rank grading system.

3. Modeling Spatial Pattern

The purpose of modeling spatial pattern is to determine if there are any significant spatial relationships between: 1) the graves; 2) the preparation and treatment of the body; 3) the age and sex structure; and 4) combinations of the above three (1-2, 1-3, 2-3). These objectives can be accomplished by referring to:

1. the distribution and frequencies of the variables for the mortuary facility;
2. the distribution and frequencies of the variables for the preparation and treatment of the body;
3. the distribution and frequencies of the variables for the age and sex structure; and

4. the distribution and frequencies of the variables for the combinations of these three groups of data using *correlation frequencies* using Pearsons *r* to determine relationships between "unrelated" data (i.e. it measures how likely these two variables are to be related to each other by giving a number between 0 and 1; the closer the combination approaches 1, the more related the two variables are). This is a bivariate statistical technique commonly used in mortuary studies.

Spatial modeling can be utilized to test for membership in socio-economic groups. Spatial analysis in this case consists of evaluating the distribution of artifact occurrence, age, and sex based upon their spatial location. In all cases the three levels of location are utilized (if data exists for them): the macrolevel, mesolevel, and microlevel. This analysis is best used to test Saxe's hypothesis that corporate groups, which control crucial and restricted resources through lineal descent, will maintain discrete formal cemeteries (Saxe 1970:119). However, as noted above, amendments have since been made to this hypothesis, and Goldstein's (1981:61) modifications will be taken into account, suggesting that socio-economic membership will be represented by:

1. a structured, formal bounded area for the exclusive disposal of the dead; and
2. the distinctive spatial clustering of the burials into one or more of these areas.

4. Methods for Analyzing Cremated Human Remains

In this thesis, I will address three sites with cremated human remains: Souphli Magoula, Plateia Magoula Zarkou, and Prosymna. Cremated human remains must be dealt with, and analyzed, differently than inhumed remains. Knowing the condition of the body before cremation is especially significant to the study of this form of mortuary practice. With this knowledge, inferences may be made concerning the length of the mortuary ritual, the season of death, or the distance between the mortal event and the mortuary site. Also of considerable concern, is the assessment of the degree to which human bone structure has been altered due to shrinkage or expansion during the combustion process. However, due to an absence of data on the latter processes, they cannot be explored in depth in the current analysis.

Buikstra and Swegle (1989:247) have noted that archaeological interest in burnt bone has been limited to four subjects: 1) determining if bone has come into contact with fire; 2) estimating the maximum temperature of the fire; 3) using surface changes in color and fracture patterns to determine the condition of the bone when it was burned; and 4) determining how burning has affected the original size of the bone.

Most archaeological reports outline the color and surface patterns of burnt bone. Two of the three site reports consulted for the Greek Neolithic material have color patterns recorded (for Souphli and Zarkou). However, in order for these observations to be significant, they must be compared with known bone and burning conditions.

Experimental studies of bone incineration are of two types: laboratory and replicative. Laboratory studies focus upon very specific variables for analysis, such as temperature, whereas replicative studies attempt to reproduce conditions that would have produced what is seen in the archaeological record. Most often, replictive cremation studies have resulted from archaeological interests in mortuary customs. Buikstra and Swegle (1989:248) note that there have been two common goals in replicative studies: 1) distinguishing the attributes of burnt remains that indicate the condition of the body before it was incinerated; and 2) estimating how shrinkage influences morphological alterations of the skeleton.

In the first instance, experiments have concentrated on defining macroscopic features, such as color, surface cracking, fragmentation patterns that relate to body decomposition or mutilation prior to burning (considered here as the pre-condition of the skeletal remains), and the possible postion of the remains in relation to fire (Webb and Snow 1945; Baby 1954; Binford 1963; Thurman and Willmore 1981). The second goal of this research, that concerning size and shape modification, has been undertaken because estimates of sex, stature, and population affinity are skeletal dimensions unmodified by burning (Buikstra and Swegle 1989:248). Compensating for the effects of burning, therefore, have great importance to the physical anthropological study of human skeletal remains.

Most descriptive and experimental work has distinguished between bones in one of three conditions; 1) fleshed; 2) green (defleshed shortly before burning); and 3) dry (bone burned after desication) (Binford 1963:98; cf. Baby 1954; Thurman and Willmore 1981; Bukstra and Swegle 1989:248). These categories are based upon the patterns of surface cracking, fragmentation, and coloring (Buikstra and Swegle 1989). In this analysis, Iwill only rely on coloring and fragmentation data provided in the site reports. The evidence for surface cracking was not reported in enough detail to warrent analysis based upon the observations of Buikstra and Swegle (1989).

Three major variables in the process of cremation can be isolated in order to study the pre-interment preperation and treatment of the dead: 1) method of incineration - such as on individual or collective pyres (Binford 1963:98); 2) the pattern of bone assocation before incineration - for example, if bodies were cremated articulated or dismembered; and 3) the pre-condition of the bone - for example, if there was cremation of dry defleshed bone or bodies in the flesh (Binford 1963:98; cf. Baby 1954; Thurman and Willmore 1981; Buikstra and Swegle 1989:248). Differences may also be recognized in the age and sex of individuals given cremation, as well as the associated burial goods.

A study of the elements present in a cremation leads to an indication of the preparation of the body. As one example, at the Pomranky and Andrew's sites studied by Binford (1963), the elbow region was not completely incinerated. Binford expected this this area to be exposed to intense burning. However, because it was not, a specific type of body preperation was inferred. Binford concluded that the body must have been prepared in such a way as to protect this area from intense burning (Binford 1963:105), and this was probably due to binding the body.

Another example from the Pomranky site illustrates a different type of body preparation. In Cremation 4, the skull of the individual was incompletely incinerated. This suggests the head was attached to the body during cremation. In contrast, at the contemporary Hopewell site, Baby (1954) observed a different program where the head was completely incinerated, suggesting the head was decapitated before cremation.

The above examples raise the important factor of burning intensity (Binford 1963:101, 105). The intensity of the fire used for cremation will lead to differing degrees of calcination of the bone. Binford noted that the degree of bone calcination can be due to four factors: 1) length of time in the fire; 2) intensity of the heat; 3) thickness of the protecting muscle tissue; and 4) the "position of the bone in relation to the point of oxidization of the consuming flame" (Binford 1963:101-102). As well, to expand on Binford's observations, three further possibilities can effect the degree of calcination: 1) the density of the bone (in direct relation to point 1,2, 4); 2) size of the bone (in direct relation to point 1,2, 4); and 4) if either *dry* bone (defleshed) or *fleshed* bone was burned (in direct relation to point 3). Variation in these factors can relate to how the bone was burned; i.e. if it was burned fleshed, defleshed, in groups or units (disarticulated), or as an articulated skeleton.

Key factors in analysis are the skeletal elements present, the frequency of these elements, the number of individuals in the particular grave (MNI per grave), and the sex and age of those individuals present. By determining the frequency and distribution of these variables, four general hypothesis can be tested for any instance of cremation burial:

1. the body was cremated articulated;
2. Null 1: the body was cremated disarticulated;
3. Null 2: the skeletal elements show differential calcination because they were burned in units or "bundles;"
4. there was a selection of certain bones for burial.

The sample used by Binford in his 1963 article was small, consisting of only 11 individuals from three contemporary sites (Pomranky, 4; Andrews, 6; Hodges, 1). His analysis first shows that material from contemporary sites can be combined and compared. As well, differential treatment can be interpreted within the framework of the dimensions of social distinctions. Further, because inferences can be made regarding the operation of the mortuary program, the data can be graded according to differential energy expenditure.

B. Monitoring Social Features: Using Symbolic Designations

The purpose of determining symbolic designations is to discover what material elements of the culture were used to symbolize social features. Symbolic designations can best be interpreted within the framework of the *dimensions of social distinctions*. Two complementary methods can be used to determine symbolic designations, and for each dimension a different configuration is expected. The means of symbolic designation can be determined by: 1) the level of energy expended in the mortuary treatment per individual; and 2) the use of valued symbols (primarily artifactual) in the treatment. These calculations also form the basis to determine rank differentiation amongst the mortuary populations.

1. Valued and Non-Valued Symbols

To determine symbolic designations using the burial goods (frequency, distribution and types), symbolic values can be given to the artifacts. These values are taken from a classification system developed by Binford (1962), where he used the terms *sociotechnic* and *technomic* to refer to artifacts of either social and technological value, or only technological value. Binford's definition of the first term is quite nebulous, and that stated by Peebles (1971) is preferred. Peebles refined Binford's classification of *sociotechnic* items by defining them in terms of their ability to define and symbolize differentiation and ranking (1971:60). Accordingly, he defined two types of symbols that could be sociotechnic: *supralocal symbols* and *local symbols*. Supralocal symbols are those that are recognized over a wide area and likely to crosscut ethnic boundaries (1971:69). Local symbols, on the other hand, serve to rank or differentiate individuals only within a given locality. As represented in Table 4.1, the use of supralocal symbols are expected to characterize vertical social distinctions, whereas local symbols are considered "non-valued symbols," and have no significant reflection of the status of the individual beyond the horizontal social distinctions (such as age, gender, or occupation).

2. Labour Expenditure as a Symbolic Marker: Rank Levels

The first step in determining rank differentiation is to assay the number of distinct levels of energy expenditure. These are indicative of the distinct levels of ranking within a society (Tainter 1977a:333, 1978:132) and serve to distinguish the degree of structural complexity in the dimension under study. This gives an indication of the number and complexity of ranking within the society. Determining symbolic designations using labour expenditure takes an entirely different approach. In this case, the first step in calculating the energy expenditure correlate, determining rank levels, can be used to show one channel through which individuals were symbolically differentiated.

a) The Energy Expenditure Index

In the previous applications of energy expenditure (Tainter 1977a, 1977b, 1977c, 1978; Tainter and Cordy 1977), Tainter used the information statistic, a monothetic-divisive statistical clustering procedure, to determine distinct levels of energy expenditure. In his study, O'Shea (1984) abandoned Tainter's method of quantifying energy expenditure, but nevertheless used polythetic and monothetic-divisive clustering techniques to isolate differences in mortuary treatment. Even though O'Shea used the *concept* of labour expenditure to interpret social distinctions in Plains Indian mortuary ritual (O'Shea 1984), he never did make the variables he used to monitor energy expenditure explicit. For all intensive purposes, O'Shea took a qualitative approach to energy expenditure. He did, however, believe that variations in energy expenditure would characterize different social categories (O'Shea 1984:64).

Sophisticated statistical clustering techniques certainly have their place in assessing the distribution patterns of a mortuary assemblage in a cemetery, such as in frequency-distribution studies of burial furniture (burial goods and other purposeful inclusions). But, in my opinion, neither monothetic or polythetic statistical approaches allow one to objectively arrive at distinct energy expenditure levels, nor an adequate description of sub-groups within a mortuary population. This is mainly because these analyses very effectively isolate similar groups within a mortuary population, but it is very difficult to evaluate acute differences between individuals using these methods. This, I argue, is critical if we are to synthesize the overall treatment accorded individuals in a mortuary population. Also critical is that a method be devised which allows cemeteries to be compared across time and space. An approach such as this would allow intra- and inter-site comparisons, regardless of the specific customary or prohibitive directives operating within any specific program of disposal. At this point, I will propose a new method that draws upon Tainter's original ideas for quantifying energy expenditure, and the theoretical approach to mortuary analysis advocated by O'Shea (cf. Fowler 1997).

In redefining the analytical parameters for studying energy expenditures (see above), it necessary to devise a method that expresses energy expenditure in terms of a cumulative record of each individual's mortuary treatment in relation to others. It has been observed that burials are a cumulative record of the repetitive normative and differential mortuary action by a culture (Peebles 1971:69). It is, therefore, reasonable to assume that a single set of directives is producing the observable cumulative sample regardless of how "complex" it may seem. Therefore, the treatment given any individual in burial will be linked systematically to the treatment received by other members of that society (cf. O'Shea 1984:35). It is also essential to account for the more "invisible" components of mortury ritual that help define the total energy expenditure in an archaeological context (O'Shea 1984:190).

Although we can never determine the "total" amount of energy expended in mortuary ritual, it is possible to infer a greater range of energy expenditure than with previous methods. This can be achieved by investigating the energy expended in three main elements of a disposal program: 1) preparation and elaboration of the burial facility; 2) the preparation and treatment of the body; and 3) the material contribution to ritual (cf. Tainter 1977a:332). The energy expended in the overall mortuary treatment can be evaluated by referring to several referent variables . These are directly observable in the mortuary context, or can be directly inferred by relying on archaeological examples, ethnographic parallels, experimental archaeological projects, and using directional logic (Goldstein 1976):

1. the preparation and elaboration of the burial facility, evaluated in terms of the effort required to procure material, manufacture the materials, construct the facility, and enhance the facility (e.g. plastered walls, engraving, grave platforms);

2. the preparation and treatment of the body, evaluated in terms of the pre-interment treatment and the act of disposal; and

3. the material contribution to ritual, evaluated in terms of

    a) the effort required to procure, produce, acquire, or replace an item lost through inclusion into the grave (Tainter 1977a:332); and

    b) the possible function of the artifact in mortuary ritual ("sociotechnic," or "technomic;" cf. Peebles 1971:60).

In this analysis, each individual is assessed on the effort expended in the various aspects of their mortuary treatment (i.e., the referent dimensions). The result is an index of the energy expended in the mortuary treatment of each individual in the cemetery. For example, as is shown in Appendix Table 4.2, the preparation and elaboration of the burial facility can be partially evaluated in terms of the effort required to construct the facility. Several elements of the facility are considered for analysis, such as the grave type, shape, volume, floor construction, wall construction, etc. Each element is graded on a pre-defined ranking scale that scores certain types of grave constructions over others. Each variable in the analysis has several components that must be considered. Each component is ranked according to the amount of energy it would have taken to manufacture, aquire, replace, etc.

In the hypothetical cemetery described in Appendix Table 4.2 there were three types of graves constructed: built graves, cist graves, and pit graves. Built graves are the largest and most technologically demanding to make. Pit graves are simple to construct, and cist graves fall somewhere in the middle. When the scores for each (and all) of the referent variables are summed, the result is a cumulative score of the effort expended in each individuals' mortuary treatment. The scores are ranked according to breaks in the index, and their distribution can be plotted to determine which individuals group together (Appendix Table 4.3). To determine which are the significant breaks in the distribution a statistical range is used. The range (*rn*) is determined by calculating the mean of the rank scores and subtracting one. For the example distribution, this range is from 1.1 to 2.1. These can be rounded to the nearest whole number. In this case, a maximum difference of *rn*=2 between index scores is considered to be statistically signifcant. Therefore, a difference of two points in the index represents a different rank distinction.

The energy expended in cremation can be ranked using the same method described for other aspects of mortuary activity (variables listed in Appendix Table 4.4 below). It can also be investigated if differential labour expended in cremation was related to status or technology, or if differences are more likely a result of taphonomic factors.

There are three major benefits with this method. The first is that it allows a greater amount of control in quantifying the data. It is difficult, and often near impossible, to weight certain aspects of an individual's treatment over others when employing univariate or multivariate statistics (e.g., giving a decorated pot a higher score than a pot with no decoration). The second advantage is that the framework is flexible. Different material attributes (grave types, burial furniture, etc.) will reflect the mortuary activity at any particular cemetery. The "predictive" aspect of the method allows the researcher to account for this variation before analysis. This helps reduce the chances of generating idiosyncratic variations which may have not been made in the living society (cf. *controlling models*, Clarke 1972:5-6; Binford 1977:6). This is intricately tied to the final benefit, which lies in the method's ability to produce data that is comparable. With this method, each disposal area is evaluated in its own terms and in its own context. Nevertheless, the cumulative mortuary variability (normative treatment, etc.), and the structure of rank grading the energy expenditures scores emulate, can still be discussed in relation to other societies.

3. Labour Expenditure as a Marker of Rank Differentiation

Using labour expenditure as a marker for rank differences is based on the inferred levels of ranking and a measure of rank differentiation made by Harary (1959). Rank differentiation is used as a primary analytical variable in the social system because it involves both elements of structure and organization. This measure of status is based on two interacting factors: 1) the number of persons subordinate to the individual, and 2) the number of rank grades that separate these subordinates from the person of higher status.

The goal of these calculations are to determine the *degree of rank differentiation* in a society. Following Harary, this is done by figuring the relative difference in status between the persons of the highest rank level and those of the lowest. For example, if we refer to the graph below, which shows a hypothetical hierarchical societal structure, the method is geared towards determining the status of A in the society.

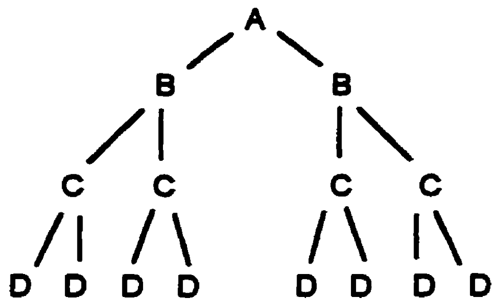


Figure 4.6. Graph of a hypothetical hierarchical social structure.

Determining the status of A is done not only by figuring the gross number of subordinates of A, but the distances from A to B, A to C, and A to D, must also be considered. The status of A is then the sum for all levels of the hierarchy, or as sum of all the subordinates in the hierarchy. This sum is the number of subordinates that separates A from D, the lowest level. Basically, the status measure of a person is the number of the individual's immediate subordinates plus two times the number of their subordinates, plus three times the number of their subordinates, etc. (Tainter 1977a; 1977b).

The following formula was designed by Harary and used to evaluate "structural or positional status." It works for any ranked hierarchy because, for person (P) who has n_k subordinates at rank level k, and where m is the number of ranks levels below P, the status of person P, (s(P)), can be measured by this formula.

$$s(P) = \sum_{k=1}^{M} k(n_k)$$

Thus, a measure of the degree of rank differentiation in the hierarchy can be expressed as the difference between highest and lowest levels. The status of the lowest level is always zero, so the degree can be represented as the status measure of the highest level (see *s(1)* below, for Kaloko rank differentiation). Working off the table below (Table 4.2) I will attempt to explain the process of calculating rank differentiation. As just noted, the goal is to denote the status of the individual or individuals belonging to the first rank level (S_a or S_1). In explaining the process I will use data from the Kaloko chiefdom in Hawaii, previously analysed by Tainter and Cordy (1977).

To compute S_1 it is necessary to consider the population of subordinate rank levels as multiples or fractions of the number of persons in the first rank grade. Tainter has used the formula N_k/N_1 for this measure, where N_k is equal to the number of individuals in rank level *k*, and N_1 is the number of individuals in the highest rank level. Transforming the data in this way gives the first rank grade a value of 1.0, and the subordinate rank levels become multiples or fractions of 1.0.

Rank Level	N	N_k/N_1	S_1
1	1	1.0	572.0
2	5	5.0	
3	12	12.0	
4	7	7.0	
5	3	3.0	
6	24	24.0	
7	65	65.0	

***Table 4.2.** Kaloko rank differentiation. Source: Tainter and Cordy 1977:Table 3.*

In order to complete the calculations for S_1 it is necessary to transform Harary's formula further. In the first instance, as is shown below (Fig. 4.9), the distance between the first rank and the subordinates ranks needs to be established; this is shown by the symbol *m*. The next transformation involves calculating the number of individuals in any given rank that are subordinate to the individual(s) in the first rank multiplied by the number of rank levels that separate them. This is given by the formula

$$n_k = N \cdot m$$

The status of the first rank, S_1, can now be computed by determining the sum of n_k and dividing this by the number of individuals who hold a position in the first rank level. This number must be divided, for if a society has 91 individuals in Rank 1, the influence (in terms of authority or power) of the paramount rank is theoretically segmented amongst 91 separate individuals. Furthermore, communications regarding the operational, cognitive, etc., aspects of society are being transmitted (proportionally) and (possibly) governed by 91 individuals. This is vastly different if this responsibility falls upon only one individual (as was the case at Kaloko). Therefore, the status of the first rank can be calculated using the formula

$$s(1) = \frac{\Sigma n_k}{N_1}$$

Rank Level	*N*	*m*	n_k
1	1	0	0
2	5	1	5
3	12	2	24
4	7	3	21
5	3	4	12
6	24	5	120
7	65	6	390
			$\Sigma = 572$

Table 4.3. *Transformation calculations for determining* s(1) *for the Kaloko data.*

The Σn_k is equal to 572, therefore, $S_1 = 572/1 = 572$, as per Table 4.3.

C. Monitoring Social Structure and Organization

The ultimate purpose of utilizing the energy expenditure correlate is to quantify social structural complexity, the degree of social organization, and the entropy faced by a society. Measures of these features are grounded in the fundamental assumption that the archaeological evidence of energy expenditure in a mortuary treatment has a direct relationship to the hierarchical strata of the society (Saxe 1970; Binford 1964; Tainter and Cordy 1977).

1. Structural Complexity

It has been shown repeatedly by Tainter that the structural complexity of a society can be determined statistically. The first statistical measure involves quantifying the "amount of organization," as Tainter called it, by using the Shannon-Weaver statistic (Shannon 1949:50-51). A measure of entropy in the social system is used to calculate both the degree of structural complexity (i.e, Tainter's "amount of organization") and the relative organization, or redundancy in the system (Tainter 1977a:336). Mortuary ritual is basically a communications system that uses certain symbols to express information about the status of a particular individual. Any communication is subject to background noise and this must be filtered. Using the Shannon-Weaver statistic for measuring information, it is essential to first calculate the entropy, or the amount of unavailable information in a system. Entropy is calculated using the formula

$$H = \sum_{i=1}^{N} p_i \log p_i$$

In this case H is the entropy of a set of probabilities, and p_i is the probability of the occurrence of the ith message (or the ith structural components/features). The number for H can range from 0 (no entropy) to $\log_2 N$ (or when all the messages or components are equally probable; this is the maximum entropy, or H_{max}). Worded, log_2N is equal to the logarithm of the number of rank levels represented in a social structure taken to the base of 2; therefore, $H_{max} = \log_2 N$.

Rothstein (1958:36) has suggested that organization can be measured as the excess of the entropy a system can potentially exhibit (H_{max}) less the entropy it actually does exhibit (H). In other words, by subtracting the amount of information the system actually does produce from the potential total, one gets an idea of the complexity of the communications between the structural components in that system; or the relative number of social features successfully communicating in the social structure. This, then, is a measure of the structural complexity of that society. Numerically, this number is given as D_I, or as Gatlin termed it, the Divergence from Equalprobability (1972). D_I is calculated using the formula

$$D_I = H_{max} - H.$$

This is equivalent to Tainter's calculation of the Amount of Organization (Tainter 1977a:336), which, using the model of a social system given above, equals the *degree of structural complexity*.

2. Measuring Organization

Now that an indication of the structural complexity of a system has been determined, attention is turned to the organizational constraints in that structure (at a particular time). Determining the relative organization of a society is basically a search for the constraint put on a system. If there is constraint, the system is not random or chaotic, and is therefore, organized.

The degree of structural complexity (the difference between the maximum and minimum entropy) can be used to determine the degree of organization of a system, or the *relative organization* (Tainter 1977a:336). This is accomplished by dividing the degree of structural complexity by the maximum amount of information (or communication) that can be processed by the particular system. This is done by using the ratio

$$\frac{D_1}{H_{max}} = RD_1$$

which is symbolized as RD_1. As with D_1, this can be plotted over time to measure changes in the degree of organization of societies chronologically. An example of these calculations using data from the Kaloko chiefdom on Hawaii is given below.

Rank Level	Frequency	p	$\log_2 1/p$	$p \log_2 1/p$
1	1	0.009	6.79586	0.0612
2	5	0.043	4.53952	0.1952
3	12	0.103	3.27928	0.3378
4	7	0.060	4.05889	0.2435
5	3	0.026	5.26534	0.1369
6	24	0.205	2.28630	0.4687
7	65	0.558	.846843	0.4708
Total	117			S = 1.9141

$H = 1.9141$ $H_{max} = 2.80735$ $D_1 = (2.80735\text{-}1.9141)$ 0.8933 $RD_1 = (0.8933/2.80735)$ 0.3182

***Table 4.4.** Entropy represented by the Kaloko rank system, Hawaii. Source: Tainter and Cordy 1977:Table 2.*

3. Monitoring Social "Complexity"

In the previous chapters I introduced the notion of monitoring social "complexity" by arguing that a society can be understood as a "degree of complexity" by how well it combats entropy. Using the calculations for entropy outlined above, this notion can be mathematically monitored. The entropy calculations for the Kaloko example above (Fig 4.11) showed that this social systems exhibits 1.9141 bits of entropy (H) compared to a possible 2.80735 bits the system could potentially exhibit (or H_{max}). By determining the rate at which entropy operates in this system it is possible to get an idea of how well this society fights off entropy, or how efficient it is. To do this, the amount of entropy exhibited by a system (H) must be divided by the potential (H_{max}). The formula for monitoring "social efficiency" is then:

$$^{\circ}SC = \frac{H}{H_{max}}$$

In this case, social efficiency is measured by how well its particular social structure and organization fare against the maximum amount of entropy it is capable of handling.

This maximum amount can be considered as "terminal entropy," or chaos. This is when the present social system will break down simply because it cannot handle the pressure of the entropy placed upon it, regardless if this has its origin internally, externally, or from a combination of both.

As an example, for the Kaloko figures used above, the calculation results in 0.6818 using the formula:

$$\frac{1.9141}{2.80735} = 0.6818(bits).$$

In this case entropy operates at 68.0% in this system, with the Kaloko system then operating at 32% efficiency against entropy. This is not as dismal at it may appear, though, mainly because the closer a society approaches 0%, or maximum entropy (i.e. chaos), the closer the system will be to at least theoretically breaking down.

As a comparative example, the Middle Woodland social system studied by Tainter (1977) exhibits 1.8354 bits of entropy compared to a possible 2.58496 bits. Entropy operates at 71% efficiency in this social system, and the society operates at 29% efficiency. Compared to the Koloko system, this system is technically less efficient because it does not combat entropy as well. This is, admittedly, a matter of degrees, but it is interesting to note that these calculations can denote fine differences between two societies separated by great distance and time, which have both previously been classified as "chiefdoms" based upon attribute lists (Middle Woodland, Illinois: Tainter 1977a:338-339; Kaloko, Hawaii: Tainter and Cordy 1977).

4. Measuring Variation and Change in Social Systems

In this analysis the classes of change which may occur in status and society are addressed. Drawing from the observations made in previous analyses, changes in status and society will be approached using two groups of data. For measures of status change, the chronological and regional variation in mortuary practices and social differentiation will be utilized. For measuring changes in society throughout the time period(s) under consideration, the variations in rank differentiation, structural complexity, and relative organization will be discussed. The purpose of studying variation and change is to provide a background against which the trajectory of social development in the particular time period(s) can be discussed. As such, in this section I explore the potential constraints or systematic aspects of such variation and change and outline methods that can be used to describe chronological and regional variation in status and society.

The basic method employed to describe changes in the social system(s) is comparative. The specific methods I use are identical to those employed by O'Shea (1984) in his study of Plains Indian (Omaha, Pawnee, Arikara) ethnicity. Although the objective here differs from O'Shea's, the principles and methods of his analysis can be used to compare the social systems outlined by previous analysis in terms of mortuary treatment, social distinctions, social structure, social organization, and rank differentiation. This analysis, then, specifically addresses regional and supra-regional variations in status and society. For determining spatial and temporal variation, six varialbes must be considered for analysis:

1. Normative Funerary Treatment
   1.1. Similarity in Normative funerary Treatment in Phase/Region
   1.2. Comparison by Site in Phase/Region
2. Categories of Social Distinctions
   2.1. Similarity in Social Distinctions in Phase/Region
   2.2. Comparison of Social Distinctions Between Sites/Regions
3. Changes in Rank Differentiation
   3.1. Rank Differentiation [in each phase]
   3.2. Rank Differentiation between [sites]/[regions]/supra-regions]
4. Change in Social Structure
   4.1. Social Structure [in each phase]
   4.2. Social Structure between [sites]/[regions]/[supra-regions]
5. Change in Social Organization
   5.1. Social Organization [in each phase]
   5.2. Social Organization between [sites]/[regions]/[supra-regions]
6. Conclusions
   6.1. Comparison of Normative Treatment between Phases/Regions
   6.2. Comparison of Social Distinctions between Phases/Regions
   6.3. Variation in Rank Differentiation
   6.4. Variation in Social Structure
   6.5. Variation in Social Organization

a) Chronological and Regional Variation

In studying chronological and regional variation attention must be focused on the two aspects targeted for discussion: 1) status; and 2) society. Social status can be described by studying the variability in normative mortuary treatment and in social differentiation. The methods by which this can be done following O'Shea's method for determining ethnicity, as noted above. The first step in this analysis is to outline the normative funerary treatment in terms of chronological phases. This is done by listing the primary features which define the mortuary treatment, such as grave orientation, the burial area, and the individual's posture upon interment. Each type within these features is given a code number, for example Orientation has 3 types, Posture has 4 types, etc. This allows the data to be compared by transforming the data in such a way that it describes what features are similar across sites. Performing the exercise to determine what is different across sites is unnecessary, as an analysis of what is similar will show what features differ, especially if presented in the format outlined below.

Feature	Phase 1			Phase 2		
	Site 1	Site 2	Site 3	Site 1	Site 2	Site 3
Orientation	Type 1	Type 2	Type 1	Type 3	Type 3	Type 1
Posture	Type 4	Type 2	Type 1	Type 4	Type 3	Type 4
Burial Area	Type 1	Type 3	Type 3	Type 2	Type 2	Type 1
etc.						

Figure 4.5. Hypothetical normative mortuary treatment outline.

The second step in this analysis is to assign similarity coefficients to the data (Person's r will be used for this analysis). What a similarity coefficient does is describe how similar certain features are between sites. This is accomplished by a count of the similar features between sites (Table 4.6) This count is then transformed into a number between 1 and 0. The more similar the features between sites are the closer the number is to one, the greater the difference between them, the closer the number will approach 0. This transformation of the data allows us to see which sites are most similar to each in terms of the overall normative mortuary treatment at the site and if the site *most* similar belongs to the same phase or is located in the same region. Each site can most simply be expressed as either positively (+) or negatively (-) belonging to their own chronological phase, or region (Table 4.7).

Site	Phase 1			Phase 2		
	Site 1	Site 2	Site 3	Site 1	Site 2	Site 3
Site 1						
Site 2				# of matching features		
Site 3						
Site 1	Similarity Coefficients					
etc.						

Table 4.6. Hypothetical example of modeling similarity in normative treatment.

Site	Most Similar Site	Same Phase	Same Region
Site 1	Site x (.89)	+	-
Site 2	Site x (.65)	-	-
Site 3	Site x (.45)	-	+
etc.			

Table 4.7. Hypothetical example of a comparison by site.

What needs to be answered next is how similar to each other are sites within their own chronological phase, and how similar are they to the sites belonging to other phases. This is statistically accomplished by calculating the average similarity the normative treatment a site has compared to sites within its own phase and region. For example, below the sites that belong to Phase 2 are 87% similar in terms of normative funerary treatment, and have very little in common with sites from other phases (34%) (Table 4.8). On the other hand, those sites belonging to Phase 1 are quite dissimilar to each other in terms of normative mortuary treatment (33%), but curiously have more in common with later phases (67%).

Phase	Average Similarity	
	Within Phase	Between Phases
Phase 1	.33	.67
Phase 2	.87	.23
Phase 3	.67	.33
etc.		

Table 4.8. Hypothetical comparison of normative treatment between phases; and for social differentiation

Although I have only outlined how the normative funerary treatment in a group of societies can be described and compared, these same methods can be used for determining similarities between social distinctions and regions. For discussing regions, "Phase" in the above tables is simply replaced by "Region," and calculations are made within the context of a region rather than chronological phases; i.e., the same steps apply. As well, for social distinctions, the distinctions replace the list of normative mortuary features. A coding system is devised based upon the types of social distinctions present or absent in each society, and this data is transformed into similarity coefficients.

The results of analysis on these three groups of data can be integrated to discuss the similarities and differences in status between individual sites and groups of sites belonging to the time period(s) and regional location under consideration. Comparing social status in this way provides the background necessary to achieve the goal of defining regions based upon social criteria, rather than in geographical of assemblage terms.

b) Measuring Changes in Society

In order to understand changes in society over time between individual sites and regionally, an entirely different approach is needed. Change in society can be determined for social structure, organization, and rank differentiation over time using the data gained from the analysis of each of these variables for the sites in question. Ultimately, these data can be used to determine change in social complexity over time and space.

Each of these primary variables (social structure, organization, and rank differentiation) must be analyzed in three different contexts in order to describe the trajectory of social change. First, time must be controlled for, and each site under consideration is plotted according to the timeline, preferably using an absolute chronology. One way to do this is to give a general graphic representation of all the sites in relation to the time considered (such as those given below). Following this, the data can then be broken up into chronological phases, if more than one is being considered. In this way both the sites considered in relation to time are described. Second, change must be determined according to spatial location. Each region has a timeline, and the sites located in the region are plotted against this timeline. Three regional units can be considered as a starting point (particularly for this study): 1) the smallest geographical regions that sites can be placed within (localized regions); and 2) two or more larger geographical units (supra-regions); and 3) the entire study area. In this way the analysis moves from the individual sites to the largest unit, the study area.

In the following, examples are given for measuring change within the largest regional unit, the study area. The data used for these example charts are drawn is taken from Tainter's (1977) data on the Middle and Late Woodlands systems of the American Mid-West.[6] Therefore, it must be made clear that the study region in this case also corresponds to a supra-region located in two distinct chronological phases.

(1) Measuring Change in Structural Complexity

Above the methods for determining structural complexity was described, which corresponds to the symbol D_I. Changes in structural complexity can be calculated over time by plotting the D_I number against time (in years). It is significant in this pattern, and those that follow, that complexity in neither structure, organization, or rank differentiation is linear.

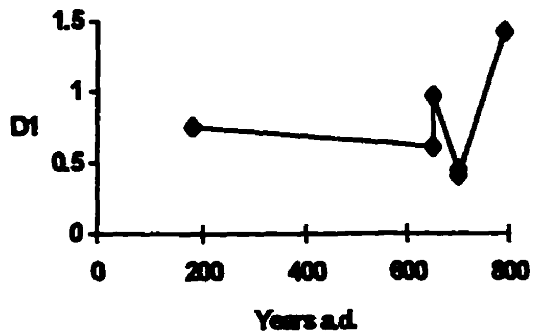


Figure 4.7. Change in the structural complexity in the Woodland social systems. Source Tainter 1977b:344.

(2) Measuring Change in Social Organization

The degree of structural complexity (the difference between the maximum and minimum entropy) can is used to determine the *relative organization* of a system. As with D_l, this can be plotted over time to measure changes in the degree of organization of societies chronologically. It is notable in the chart below, how closely the pattern of relative organization of these societies corresponds to their structural complexity.

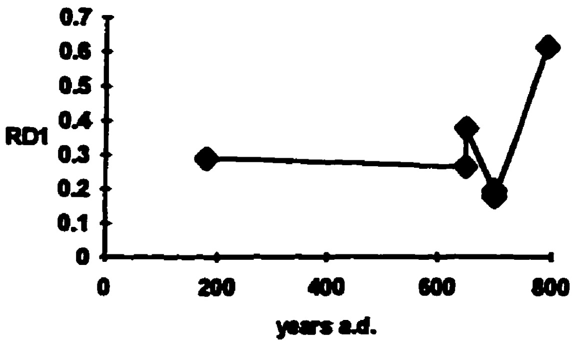


Figure 4.8. Change in the degree of social organization in Woodland social systems. Source: Tainter 1977:345.

(3) Measuring Change in Rank Differentiation

As with the other permutations, changes in rank differentiation can also be calculated over time. Here, unlike the structure and organization of these societies, the rank differences between them are quite minimal. The site with a score of over 160 is an anomaly and Tainter (1977b) has given numerous reasons for questioning the reliability of the data from this site.

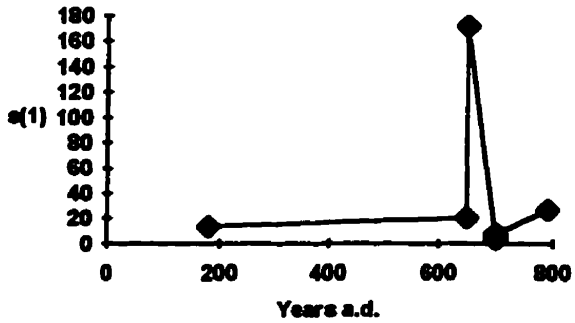


Figure 4.9. Changes in rank differentiation in the Woodland social systems. Source Tainter 1977b:346.

IV. Stages of Analysis

Analysis must, then, proceed through five ordered stages:

1. A search for socially generated constraint or patterning in the distribution of funerary attributes for each mortuary population represented in the study area.

2. A description of each differentiated subset of the funerary population in terms of the categories of age, sex, frequency, and spatial distribution.

3. The classification of each differentiated subset in to three types of mortuary distinction: vertical distinctions, horizontal distinctions, and special status differentiation. This will be achieved by relying on the referent dimensions, or values, and behavioral correlates.

4. The interpretation of each differentiated unit of the mortuary population, using the behavioral correlates and the appropriate models of social distinctions for the Greek Neolithic period.

5. A comparison and contrasting of different patterns observed between each mortuary population in terms of both geography and chronology.

When these five steps are completed, and all possible identifications are made, the relationships between the different dimensions can be examined, the remainder identified, and social inferences can then be made. As it stands, this modeling procedure is not particularly complex, but does account for the two principle aspects of mortuary patterning (O'Shea 1984:48; cf. Binford 1964; Peebles and Kus 1977; Braun 1979):

1. It predicts the values of the variables of age, sex, frequency, and spatial arrangement (when possible, at all levels).

2. It predicts, using the behavioral correlates, the structure of attributes that will serve to mark distinctions within the mortuary population.

Notes to Chapter 4

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[1] Binford (1971), Chapman, Kinnes and Randsborg (1981), O'Shea (1984), provide in-depth reviews of the literature, rich bibliographies, as well as providing a history of mortuary analysis.

[2] O'Shea (1984:36) cites this as the *reason* for the plague pits in Europe, or the massacre burials at Crow Creek.

[3] These terms are very closely associated with those used by Peebles and Kus in their 1977 paper. They defined *superordinate* and *subordinate* dimensions in order to show which attributes of the mortuary variability were the result of social ranking. These two dimensions correspond directly to the *vertical* and *horizontal* dimensions used by Tainter, respectively. They are used here simply to establish continuity in approach to the data, and a more comprehensive use of terminology.

[4] Calculating the MNI using bone scatter data involves grouping the data by referring to how the skeletal elements (such as a humerus, or part of a cranium) are distributed spatially throughout the site, if possible by age and sex. Osteological relationships are evaluated through numerous methods to see if skeletal elements from various locations at a site are in fact related (these techniques are outlined in most human osteology texts).

[5] In calculating a Pareto distribution Orton and Hodson (1981) are suggesting that the researcher submit a hypothetical distribution to compare to the actual observed results. For example, in Hodson's study of 740 single graves from Halstatt, he simply counted the number of functional types of artifacts in each grave (n), which broke the graves up into 13 different groups. Applying the Pareto formula to these data gives a hypothetical distribution of the data (n_1) : 453 graves are expected to have 1 or 2 types, 122 to have 3 types, etc. The model predicts that 27 graves will have more than 13 types, the reason for the discrepancy in the totals column for n_1. The point of this exercise is to determine where the largest break in the sample comes. For the Halstatt graves, Hodson determined when x=6 the difference in fuctional types is statistically signficant. In other words, there is a definite break in the distribution of types of grave goods between 6 and 5. If the theoretical distribution $F_1(x)$ is trucated and distributed over the lower scores (x=6 to x=13), a second distribution (F_2 (x)) shows a hypothetical distribution for all scores at Halstatt (n_2). At this point the observed distribution (n) can be compared to the hypothetical distribution and tested for statistically significant breaks.

x	n	$F_n(x)$	$F_1(x)$	n_1	$F_2(x)$	n_2
1	212			453		454
2	220	0.584	0.580	*	0.613	*
3	138	0.773	0.756	122	0.785	127
4	82	0.881	0.832	57	0.864	58
5	41	0.936	0.874	31	0.908	33
6	25	0.970	0.800	19	0.935	20
7	9	0.982	0.918	13	0.952	13
8	6	0.991	0.931	10	0.968	11
9	3	0.995	0.941	7	0.977	7
10	2	0..997	0.948	6	0.985	6
11	0	0.997	0.954	4	0.991	4
12	1	0.999	0.959	4	0.996	4
13	1	1.000	0.963	3	1.000	3
Total	740			713		740

Example of data layout for Pareto distribution using functional types in the Halstatt graves. Source: Hodson (1977).

[6] **The data for the Woodland social systems studied by Tainter are as follows:**

Mound Group	Date (A.D)	R.L.*	D_1	RD_1	s(1)
A	180	6	0.7496	0.29	13.671
B	650	5	0.6125	0.2638	20.446
C	650	6	0.971	0.3756	171.6
D	700	5	0.4546	0.1958	3.413
E	700	5	0.4125	0.1777	7.756
F	790	5	1.426	0.6141	26.998

* R.L. = Number of Rank Levels

Source: Tainter 1977b:344, Table 9.4.

Appendix Table 4.1. Ranking variables for the energy expenditure index.

Variables	Sub-Variables		Comments
	Criteria	*Rank**	
Source	Imported	1	
	Local	2	
Distance	>500 km	1	measure of procurement effort, by land or sea is relative. See Cullen 1985.
	>100 km	2	
	<100 km	3	
	Local	4	within region of exploitation
Manufacture	Imported, finished (bone, stone)	1	
	shape 1-3; material 1-2; unusual, slipped-burnished-painted	1	see below for shape and manufacture definitions
	local, worked (bone, stone)	2	
	shape 1-2; material 1-2; slipped-painted; monochrome-burnished; Urfirnis ware	2	
	import, unfinished and locally worked (stone)	2	
	shape 3; material 1-2; slipped-painted; monochrome-burnished	3	
	shape 1-3; material 1-2; monochrome	4	
	shape 1-3; material 1-2; plain	5	
	local unworked (bone, stone)	6	
Individual artifacts	spindle whorls figurines amulets/ornaments	5 3-5 3-4	simply made dependent upon style complexity; marble -rank 3 depends upon material and craftsmanship
Function	Sociotechnic- Supralocal	1	see below for definitions
	Sociotechnic- Local	2	
	Technomic	3	

Table 4.10. Cumulative ranking variables for burial furniture or goods, and purposeful inclusions.
** In this case the highest rank is represented by 1.*

Rank Values for Shape (and Size) Classes

Rank

1. large or difficulty made shape (e.g. carinated vessel, or pithos)
2. moderate size, globular or straight-sided shape
3. small size, globular or straight-sided shape

Material Classes

Rank

1. fine
2. coarse

Function Classes

These are the same classes used to denote symbolic designation, but they also refer to the function of the particular artifact (Binford 1962). Following Peebles (1971) definitions, the ranks given to the artifacts in terms of *symbolic* and *technological* function are as follows:

Rank	Symbol
1	Sociotechnic Supralocal symbolic function
2	Sociotechnic Local symbolic function
3	Technomic function

Appendix Table 4.2. Energy expenditure index for a hypothetical mortuary population

Grave #	Skeleton #	Burial Facility						Subtotal	Preparation of the Body				Subtotal	Burial Goods				Subtotal	Total Score
		Type	Shape	M^2 Rank	Floor	Walls	Special Features		PBA*	Posture	Pre-Inter**	MNI + Type		Source	Distance	Manufacture	Function		
1	1.1	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
1	1.2	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
2	2	1	1	1	2	4	2	11	1	1	1	1	4	2	4	2	3	11	26
3	3.1	1	1	1	2	3	2	10	1	1	1	2	5	2	4	3.5	3	12.5	27.5
3	3.2	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
3	3.3	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
3	3.4	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
3	3.5	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
4	4.1	1	1	1	2	3	1	9	1	1	1	2	5	3	5	7	4	19	33
4	4.2	1	1	1	2	3	1	9	1	1	1	2	5	3	5	7	4	19	33
4	4.3	1	1	1	2	3	1	9	1	1	1	2	5	3	5	7	4	19	33
4	4.4	1	1	1	2	3	1	9	1	1	1	2	5	3	5	7	4	19	33
4	4.5	1	1	1	2	3	1	9	1	1	1	2	5	3	5	7	4	19	33
5	5.1	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
5	5.2	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
5	5.3	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
5	5.4	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
5	5.5	1	1	1	2	3	2	10	1	1	1	2	5	3	5	7	4	19	34
6	6.1	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
6	6.2	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
6	6.3	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
6	6.4	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
6	6.5	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
7	7	1	1	4	2	3	2	13	1	1	1	2	5	3	5	7	4	19	37
8	8.1	1	1	4	2	5	2	15	1	1	1	2	5	3	5	7	4	19	39
8	8.2	1	1	4	2	5	2	15	1	1	1	2	5	3	5	7	4	19	39
8	8.3	1	1	4	2	5	2	15	1	1	1	2	5	3	5	7	4	19	39

* Pattern of bone association. ** Pre-interment treatment

Appendix Table 4.3. Rank distribution based upon the energy expenditure index given in Appendix Table 4.2.

EX Score	Skeleton #	Rank Level
26	2	1
28	3.1	2
33	4.1	3
33	4.2	3
33	4.3	3
33	4.4	3
33	4.5	3
34	1.1	3
34	1.2	3
34	3.2	3
34	3.3	3
34	3.4	3
34	3.5	3
34	5.1	3
34	5.2	3
34	5.3	3
34	5.4	3
34	5.5	3
37	6.1	4
37	6.2	4
37	6.3	4
37	6.4	4
37	6.5	4
37	7	4
39	8.1	5
39	8.2	5
39	8.3	5

Appendix Table 4.4. *Variables for determining energy expenditure using cremated human skeletal remains.*

Variable	Variable Name	Rank Value	Description
1	Mortuary Facility	1	Pit
		2	Other
2	Degree of Incineration	1	Complete
		2	Incomplete
		3	Not incinerated
3	Pre-cremation Treatment	1	Burned in units
		2	Burned bound
		3	Burned disarticulated
		4	Burned articulated (unbound)
4	Pre-cremation Modification	1	Defleshing (burned dry)
		2	Burned fleshed
		3	Not modified
5	Defleshing Process	1	Defleshed (method unknown)
		1	Cutting (cut marks on bones-human modification)
		2	Burial-Exhumation-Reburial (can include, as an example, ritual wrapping and hanging from tree [Yanomamo practice], or actual interment-exhumation-reburial).
		3	Exposure (cut marks or scarring [not due to burning] on bones; only applicable if cut marks not due post-depositonal factors (such as animal or plant activity, agriculture, or other anthropogenic vectors).
		4	Not defleshed
6	Bone Elements (no. of categories present)		Ranked Frequency by number
7	Number of Elements		Ranked Frequency by number
8	Burial Scenario	1	Single interment
		2	Multiple interment
9	Grave Furniture/Goods and Purposeful Inclusions		Ranked according to Cumulative Ranking Variables.
	Additional Reference Variables		
	Variable 10: Age		
	Variable 11: Sex		
	Variable 12: Age-Sex Category		

* The scale used in this table is ordinal, with the lowest number representing the highest rank. In the cases when a grave (with multiple interments) is used as the unit of analysis, average scores for the unit can be used. This can result in fractional scores (cf. Kephala, Chapter 9 below).

PART II

MORTUARY ANALYSIS AND SOCIAL RECONSTRUCTION

CHAPTER 5

BACKGROUND TO THE GREEK NEOLITHIC

The following discussion addresses the generalities of Neolithic material culture. I will treat the trends in material culture throughout the Neolithic under the general headings of natural environment and resources, settlement, subsistence (economy), technology and crafts, and trade and exchange. A discussion of society is excluded from this chapter, as it is the focus of the thesis and will be addressed in the context of each phase.

I. Earliest Neolithic in Greece?: the "aceramic" debate

Vladimir Milojčić was the first to propose the possibility of a short archaeological phase at the beginning of the Neolithic in Europe, characterized by a distinct lack of ceramics (1952). Milojčić's ideas were promoted by work already done in the Near East at the sites of Jericho, Ugarit, and others in northern Iraq (cf. Bloedow 1991:2). With the identification of this phase in the Near East, between 1953 and 1958 Milojčić set his sights on testing habitation areas in northern Greece to see if they too had evidence of an "aceramic" Neolithic phase (Milojčić 1959).[1]

Immediately upon excavation, Milojčić determined that "aceramic level" deposits existed at the sites of Argissa Magoula, Otzaki Magoula, and Arapi Magoula in Thessaly. However, of these three sites, and to this date (Bloedow 1991:2), the only final publication of a so-called "aceramic level" has been Milojčić's separate volume "Aceramic

Level" for Argissa. The exposures at the site were small and the general lack of publication on "aceramic" levels in Greece has led many scholars to doubt the validity of Milojčić's conclusions.

A. The Problem of Dates

As seen in regions bordering Greece, Cyprus, the Balkans, and Anatolia, a "preceramic" or "aceramic" phase for the Greek Neolithic has recently been revitalized by early dates from some ten sites. These strata hold deposits which lie below those dense with Early Neolithic ceramics. The problems involved in determining chronology are always complex. Attempts to determine the length of the "aceramic" phase in Greece have been approached by trying to align relative chronologies with C^{14} dates (Bloedow 1991). In all chronological determinations, the greater the sample, the more confidently can be assigned a sequence. However, as Bloedow notes (1991:40), there are few radiocarbon samples from "aceramic" levels, and even Franchthi Cave only has a few (1991:40 n.238).

Although radiocarbon dates for this "phase" are scarce, those taken from several sites place this early phase of the Neolithic between 6800-6500 B.C. (Table 5.1). At the upper end of the spectrum lies Argissa, where a $50m^2$ deposit excavated by Milojčić (Milojčić, Boessneck, and Hopf 1962) yielded two dates. Knossos, on Crete, has also produced several very early dates (Evans 1964). Other sites in Thessaly (Gediki, Souphli Magoula, and Sesklo) are also reported to have a short aceramic phase preceding the Early Neolithic deposits (Theocharis 1958). More recently, Tellenbach has subscribed an aceramic phase to the sites of Dendra and Zaïmis Cave (1983). And, more recently still, at

Franchthi Cave, in the Argolid, this phase has been termed the "Initial Neolithic" by Perlès (1990) and Vitelli (1993), with dates ranging from about 6000-5800 B.C.

Site	"Aceramic"
Franchthi Cave	P-1392 7794±140 BP = 5844±140 BC
	P-2094 7927±101 BP = 5977±101 BC
	P-2095 7981±105 BP = 6031±105 BC
Sesklo	P-1681 7755± 97 BP = 5805± 97 BC
	P-1682 7483± 72 BP = 5583± 72 BC
	P-1690 7300± 93 BP = 5350± 93 BC
Knossos	BM-124 8050±180 BP = 6100±180 BC
	BM-278 7910±140 BP = 5960±140 BC
	BM-436 7740±140 BP = 5790±140 BC
Argissa	UCLA-1657A 8130±100 = 6180±100 BC
	UCLA-1657D 7990± 95 = 6040± 95 BC
	Early Neolithic
Franchthi Cave	P-525 7404± 81 BP = 5754± 81 BC
	P-1667 7278± 86 BP = 5328± 86 BC
Argissa	GrN 4145 7500± 80 BP = 5550± 80 BC
Sesklo	P-1679 7611± 83 BP = 5561± 83 BC
	P-1678 7427± 78 BP = 5477± 78 BC
Knossos	BM-272 7570±150 BP = 5650±150 BC
Nea Nikomedia	P-1202 7557± 91 BP = 5607± 91 BC
	GX-679 7780±270 BP = 5830±270 BC

Table 5.1. *Synthetic table of "Aceramic" and Early Neolithic calibrated C^{14} dates. Sources: Demoule and Perlès 1993; Bloedow 1991.*

Bloedow's (1991) examination of the radiocarbon evidence suggests that there are some serious problems, given the latitude of the dates. For example, at Sesklo the "aceramic" phase would last about 144 years; and at Knossos about 140 (Bloedow 1991:43). The standard deviations of the dates, though, allow these dates to be shrunk further still (Table 5.1). Further, there are some obvious discrepancies between the dates at certain sites. At Sesklo, the dates for P-1680 and P-1682 show perhaps a greater amount of variation than should be expected from two samples taken, at the most, 12 cm apart in depth (Bloedow 1991:41). This is not to say that the two dates are not in correct sequence. However, if one looks at the "Early Neolithic" dates from Sesklo, both are older than or very close to the "aceramic" dates. Not only is this confusing, but it makes for an untrustworthy chronological sequence: from Aceramic to Ceramic, while both occur at the same time! Bloedow has also reported similar chronological confusion at Francthi, Knossos, and Argissa (1991:42-43).

B. Defining the "Aceramic"

The assemblage that characterizes the "aceramic" is almost indistinguishable from the "later" Early Neolithic phase. Subsistence practices seem to be quite similar at this time, as almost all of the domesticates known for the Neolithic are present (Demoule and Perlès 1993:365). There is a rich and well made bone industry accompanied by the characteristic ground stone and pressure-flaked stone tools of the EN. The "aceramic" assemblage also includes terracotta ornaments, including earplugs and figures, and the so-called "sling-bullets." However, problems in defining this phase are based upon the few small pottery sherds found at the topmost levels of the "aceramic" deposits.

Three different views have come out of the debate over defining the "aceramic." Based upon Milojčić's observation's and his own, Theochares (1958; 1973) wrote about the possibility of a "aceramic" Neolithic phase in northern Greece. He argued that the "barren" deposits show a progressive development of local traditions (from the Mesolithic) which began as crude and rare. Reconsidering this data, Bloedow (1991) concluded that this phase is an interruption sequence. Bloedow suggested this is when the introduction of an exogenous, fully ceramic Neolithic was coming into being. Besides citing the numerous problems with the radiocarbon samples, Bloedow also pointed out that an "aceramic" phase for the Greek Neolithic is really a moot point. In his opinion, the evidence suggests only that the knowledge of potting came from outside Greece, for nowhere is there documentation of any early experimental potting in Greece (1991:43).

The Neolithic in Greece also corresponds to the first settled communities. Even Franchthi Cave, which has an relatively continuous sequence over 25,000 years, shows no positive indication of an "aceramic" break. Unlike Demoule and Perlès (1993), who suggest the sherds present in "aceramic" levels may simply be intrusive (1993:368), Vitelli (1993) considers that the few pots were treated as rare and precious items. Considering this argument, the case then becomes one of determining if the pottery came from sources outside of Greece, or were of local manufacture. This must lead researchers to seriously consider exactly how one should define an "aceramic" phase: is a phase "aceramic" if the pottery was not manufactured on-site, or further, if it is not found in abundance in all deposits?

Regardless, perhaps it is the questions that are being asked that are more the problem, than the problem itself. Perhaps if one considers the function of these sites during the earliest Neolithic, when sedentism *first* becomes a way of life, then some perspective on the problem may be granted. We might, in this early time, be seeing the precurors to settlement, with few and transitory inhabitants, who came with little, and left with all of it. In a short 140 years, why should we expect a semi-nomadic people to leave very much of themselves behind for us to see? And why should they leave what might be most valuable to them, such as what they used to cook with? In all consideration, speculation at this point is unwarranted. As the few papers on this problem have shown, debate on this issue awaits further excavation, which will allow a broader range of radiocarbon samples and stratified deposits to be examined.

II. Natural Environment and Resources

A. The Landscape

The Greek terrain is generally restrictive, dominated by mountains and the sea. Most of the country is slope land, often very steep, with low mountain ranges rising to over 2400 meters. The terrain, then, is one of extremes, with high peaks and low-lying plains. Between the two extremes, the landscape consists of rolling hills, ridges, and very rough and steep semi-mountainous terrain. The most notable difference in the landscape is the extensive plains in the northern mainland. Elswhere is Greece, the mountain ranges, hills, and ridges segment the country into thousands of coastal, upland plain, and valley pockets. Therefore, it is not unusual for one to find the most intensive habitation in the study area belonging to these "pockets" of arable land. The prominence of the mountains reflects the position of Greece between the two immense Eurasiatic and African Illus. s. These have been, and still are, the cause of a great deal of tectonic activity in the Aegean. This activity has led to a complex distribution of rock types.

1. Geology

The rock types common to Greece are distributed according to the formation of the extensive Pindus mountain range. Sedimentary rocks are associated with this range and branch to the east, making up most of the eastern part of central Greece and Euboea.

They extend through the Peloponnese and compose almost all of Crete and Rhodes. The sedimentary rock is dated to the Cretaceous or later, and limestone is common. North of the Pindus range, in Thrace, westward to Macedonia, and south through Thessaly, metamorphic rock is most common. This type appears again as one moves into southern Euboea, central Greece, and the Cyclades. Igneous rocks are the rarest of the three main types of rock, and are scattered throughout the metamorphic rock, but are rarely found in sedimentary areas.

The geology of Greece makes for many bays and inlets, providing sheltered spots for beaching boats, but good harbours are rare. As well, the landscape ensures that mainland travel is arduous, and not something that was normally contemIllus. d in prehistoric times. Thus we find the material connections between northern and southern areas to be limited, but nevertheless present.

2. Soils

The soils of Greece are the result of interactions between parent materials, topography, climate, time, and use. Due to the great variability of these factors, generalizations about Greek soil are difficult. Therefore, I find it more appropriate to discuss where broad soil types exist.[2] Below I will address the range of three contemporary soil types and their predecesors (Illus. 5.3).

The first range of contemporary soils are found in low-lying areas and are largely composed of deep lacustrine and alluvial soil types. These soils respond well to irrigation, fertilizers, and crops that are adapted for both regional soil and climate. These soil types are found exclusively in lowland, level areas and are not subject to erosion, but flooding and drainage have been a concern in some areas. All of these low-lying areas are not always the most fertile, but are important because they are the only cropland available (Myrick and Witucki 1971:25). Lowlands are used simply because they are flat and cultivatable, but soil may be thin, gravely, rocky, saline, or dry without much possibility for irrigation. The next group of soils are those found in the semi-mountainous areas of Greece. Some of these areas are quite fertile, and produce high quality crops. Many feed grains and wheat are produced on this type of land across the major grain producing provinces of Thessaly, Thrace, and Macedonia. In the rougher areas, crops are limited to trees and this land also supplies the majority of pasture land. The third group of soils consist of those found in mountainous areas. Much of the land is rocky and inaccessable, but there are limited areas currently associated with pastureland crops of hay and grain, which are used as a feedbase for livestock.

The highlands are useful only for low-grade grazing. Lower mountain slopes have some arable land and the practice of terracing has provided safe cultivation on these slopes. This level, cultivatable land makes up only one quarter of the total land area of Greece (Pepelapsis and Thompson 1960:147). It is concentrated in the mountain valleys and pockets located along the coast. Major tracts of cultivatable land are found in Thrace, Macedonia, and Thessaly. In prehistory, these northern areas are thought to have consisted of dense woodland and scrub vegetation (Payne 1985:225; Rackham 1982:188, 193).

The best arable land today is concentrated in the pockets of lake plains, flood plains, and deltas. However, when rivers are swollen due to rapid mountain runoff, low-lying areas are often flooded. As a consequence much of the farmland can experience damage. These areas are made up largely of light "rendsina" deposits, which are thought to be remains of brown wooodland soils (Dickinson 1994:26). The soils of the Neolithic were, however, more likely to lose nutrients in a semi-arid climate characteristic of Greece (Bintliff 1977:100-104). Therefore, they will become less productive as time goes on, even if the fertile soils were not worked intensively for too long.

B. Climate

The climate of Greece has not changed significantly since the last Ice Age. Conditions for most of prehistory were only slightly warmer and drier than the present (Sandars 1978:20). In prehistory, as to this day, the semi-arid Mediterranean climate prevails: temperatures are warm and evaporation rate is high. The lowland areas have a typical Mediterranean climate, with mild, rainy winters and long, hot summers. The upland regions have cooler, rainer conditions, and may have snow and freezing conditions in winter. However, irregular terrain produces local variations in temperature and precipitation. Recent studies are laying more emphasis on these local conditions, as well as evidence for local erosion and alluviation sequences.

The most recent work done on understanding erosion, sedimentation, and deltaic and valley buildup runs counter to general models once proposed. It is now thought unlikely that woodland covered the entire Greek mainland after the last Ice Age, as proposed by Renfrew (1972:Fig. 15.1), or that there are only two universal phases of erosion and sedimentation that produced the "Older Fill" and "Younger Fill" phases for the Mediterranean (Bintliff 1977, following Vita-Finzi's 1969 scheme). In the latter scheme it was argued that the "Older Fill," formed in the pre-Holocene, eroded during the Neolithic, the Bronze Age, right up to Medieval times, building up deltas and coastal plains. Only after the Roman period did interior deposition take place with the "Younger Fill."

The problem with this hypothesis is that it assumes uniform climatic conditions, insisting that the origin of Younger and Older Fills lie in climatic change. Rather, Wagstaff (1981) proposed that an anthropomorphic origin for such change be more seriously considered. This has been further supported by Pope and van Andel's work on the Argolid Exploration Project (1984). However, neither human activity nor physical forces seem to be totally responsible for major effects on the environment. Because of the contraction and expansion of human habitation, the effects on the environment are not irreversibly cumulative (van Andel et al. 1986; for the southern Argolid sequence). The work done by the geologists of the Argolid Exploration Project demonstrates the inadequacy of climatic change to explain the Younger Fill, and takes us a step further in understanding chnges in site location, from well-watered valleys during the Neolithic, to the interior during the Early Bronze Age.

C. Vegetation and Wild Flora Resources

The densest areas of Neolithic settlement are found in the dry, warm lowlands which receive a modest 300-800 mm of precipitation a year. Known as the "Lowland Aegean Belt" (Anastassiades 1949), this area encompasses Thessaly, central Greece, the northern and eastern parts of the Peloponnese, and the Aegean islands (Illus. 5.3). Most authorities agree that these lowland areas were forested during the Neolithic (Halstead

1989b; Bottema 1974; 1979; Greig and Turner 1974), with very dense woodland most probably confined to the northern and western parts of Greece due to a higher level of annual precipitation. Core samples taken in Epirus and Macedonia show progressive reforestation after the Pleistocene era. Although Rapp and Aschenbrenner (1978:56-57) generally characterize the Neolithic woodlands as dominated by evergreen species, they consisted of mainly hardy species: deciduous oak, elm, ash, lime, hazel, and pine on the hill slopes (Demoule and Perlès 1993:360). Other varied evidence from the southern mainland suggest a sample of the deciduous trees present in the Neolithic. Evidence from Lerna, Tiryns, and Nichoria show ash, boxwood, buckthorn, elm, horse-chestnut, hornbeam, maple, oak, poplar, willow, and maybe yew, were all available in the Neolithic (see Rackham 1983 for review). Rackham (1983:347) has argued that the clearing of much of the woodland for agricultural purposes would have not only provided building materials, fuel, etc., but would have also allowed the maquis- type of vegetation to develop. This ground cover would have been a far more varied and useful range of plants for human use.

Pollen data from the Greek Neolithic is quite limited, with Macedonia and Epirus most abundantly represented. Presevation is always a factor in collecting pollen data, and these areas have significantly higher rainfall than the rest of Greece (Bintliff 1977), but lack the dense Neolithic settlement pattern which is concentrated in the warm, dry areas (Hansen 1991, see especially Fig. 9). Particularly in the south of Greece, researchers are more concerned with arboreal types of vegetation. From the data available on Boeotia, Hansen (1991) suggests that low shrubs and small trees (juniper and terebuth, for example) are underrepresented in the pollen record, and would have been the primary vegetation. Hansen's hypothesis gains support from Greig and Turner's (1974) study of the Lake Copais basin, which in fact exhibited a pollen diagram of sparse oak woodland and numerous shrubs during the Early Neolithic phase. Samples of later date from Kitsos Cave (Renault-Miskowski 1981) show a far more open environment predominated by *Cichoraie*. As well, during the Early Neolithic, pollen recovered from the Franchthi Cave area (Koiladha Bay) lends support to this hypothesis due to the abudance of open arboreal vegetation in the sample, mainly of *Quercus cerris* type (Bottema 1990).

The original wild vegetation in Greece at the beginning of the Holocene then probably consisted of steppe, grassland with low vegetation (shrubs and bushes), dense woods in well watered areas, and scrub on the semi-mountainous, rocky hills (Payne 1985:225; Rackham 1982:188,193; 1983:346). Besides the fig, olive, and vine native to Greece, the almond, cherry, pear, pistachio, walnut, and wild strawberry are common fruit or nut trees and bushes. These may not have been particularly abundant in wooodland areas, but with the spread of maquis vegetation due to the clearing of land, these would have provided variety to the diet, as well as acting as fodder. In open areas smaller food plants, such as wild barley and oats, lentils, vetches, and coriander are known (from pre-Neolithic levels at Franchthi). It is also suspect that plants generically known as *khorta*, such as wild onion and garlic, as well as herbs like basil, oregano, mint, rosemary, sage, thyme, and the saffron crocus would have been used to supplement and accentuate the diet. It is likely that these wild, native plants were collected and domesticated on a greater scale than can be indicated by the present evidence.

1. Changes in Floral Resources during the Neolithic

Little can actually be said with confidence about the early prehistoric palynological record of Greece. Without an intensive record of palynological studies, recent treatments of the subject are left to trace only broad developments in a record characterized by equally broad gaps. In general, however, the palynological record is characterized by very little use of wild plants regardless of their availability. Even for the earlier Mesolithic, carbonized seed remains yield the only evidence of garrigue-type plants: fruit, legumes, and wild cereals (Hansen 1991); but several carpological studies show that these plants were not widely exploited by the early farmers (Halstead 1988; Halstead and Jones 1980; Hansen 1988; 1991; 1994; Kroll 1991; van Zeist and Bottema 1971; Renfrew 1966). Again, in general, fruit seemed preffered to the wild, and higher caloric, legumes and cereals.

From the scant subfossil pollen precipitation record, van Zeist and Bottema (1982) and Bottema (1994) have attempted to translate this data into terms of vegetation. Although problematic, this record stands as the basis for determining palyonological change (Bottema 1994:46). The beginning of the Early Neolithic is marked by a change in the pollen record, supposedly due to changes in the forest composition (Bottema 1994:55). Even though farming activity is marked soon after 6500 B.C. (Theocharis 1979), Bottema notes that there sems to be little anthropogenic effect upon begetation (1994:55). By the end of the Early Neolithic changes in the record could not be of just the natural order and eventually human action becomes the dominant element affecting vegetation into the Bronze Age.

The study by Bottema revealed four significant shifts in the record spanning the Neolithic period. The first significant change happened at the inception of the Neolithic. In Northern Greece, there is a substantial decrease in deciduous oak, while hazel (*Corylus*), fir (*Abies*), and pine (*Pinus*) increase. Notable is that the Thracian lowlands experienced little change. Southwest of the Pindos moutain range, however, things remained much the same as they did at the beginning of the Holocene. The oak forests drop to a somewhat lower level (300-700 m asl), but above that elevation, a belt of oak, lime, elm and hazel developed, with only conifers and some beech higher yet (Bottema 1994:55). Further to the south and east into Boeotia, the region is dominated by an open oak forest in the foothills mixed with *Pistachia* and *Juniperus*. This combination points to dry, open woodland with little evidence for scrub. Not surprisingly, then, there is no record of beech, hazel, or hornbeam in the record, and olive is also not found (possibly because it demands an area of high moisture) (Bottema 1994:56).

Other changes in the record studied by Bottema occur in the Late Neolithic. The first change in Thessaly during the Late Neolithic 1 finds grass pollen outnumbering tree pollen at this time. Reminiscent of Thessaly, oak dominates over the now staple species of pine, hazel, elm, lime, and eastern hornbeam (Bottema 1994:55). By 4800 B.C., the Late Neolithic 2 subphase, the mainland deciduous tree belt experienced the spread of hop hornbeam (*Ostrya carpinifolia*) and the eastern hornbeam (*Carpinus orientalis*). Other changes are also notable in the regional vegetation: a further spread of the carboniferous forests in Vernon, Voras, and Verminion above 400 m asl; the Macedonian lowland; and the Thracian Pangaion, Markiou, and Rhodope mountains. In Epirus, west of the Pindus mountain range, and in Thessaly beech and needle-leaved trees are still present. But at the same time, light-demanding trees, such a bernet (*Sanguisorba minor*) disapprear from the pollen record. In Bottema's opinion, this is most probably due to the decreased penetration of the sun through the forest or woodland canopies (1994:56).

The final change in the pollen record during the Neolithic appears during the final phase, the Final Neolithic, and actually characterizes much of the Early Bronze Age as well (Bottema 1995:57). During the interval between 4800 and 2300 B.C., hornbeam species came to dominate the pollen record. Based upon pollen cores at the higher Mediterranean elevations, hornbeam is so common that Bottema terms this the period of eastern and hop hornbeam. Although *Ostrya* grows best on the edge of a clearing, or a location with sufficient light, and *Carpinus* could withstand grazing or even benifit from it, there is not sufficient evidence to suggest an anthropogenic cause for the widespread distribution of hornbeam (1994:57). Only by about 2300 B.C. (end of the Early Bronze Age), is there direct evidence for the vigourous impact of prehistoric people on the surrounding vegetation (Bottema 1994:57-58).

D. Mineral Resources

Although Greece is rich in minerals, the distribution of them is uneven. Demoule and Perlès (1993:361) have highlighted three principal distribution patterns for Aegean mineral resources: 1) ubiquitous; 2) regionally restricted; and 3) unique or very localized. Clay deposits in the Aegean form a ubiquitous pattern as they are found throughout the Aegean, and were used principally for making terracottas. Similarly, cherts, jaspers and quartz are also quite common, but saw limited use during the Neolithic because of their poor quality (Demoule and Perlès 1993:361). However, high quality flints from the western Greek mainland, the quality jasper from the Pindus mountain range as well as steatite and marble came from regionally restricted sources. Marble in particular is quite rare, and was used to make only a small range of items (figurines, pendants, and vases. These are thought to be prestige items, not only becuase of their rarity but also because of their wide distribution, from Knossos on Crete to Thessaly in northern Greece (Renfrew 1979:186).

The distribution of obsidian during the Neolithic period is quite wide even though there are only a few plausible sources. The obsidian from Melos (the Sta Nychia and Demenegaki quarries), Giali, and Antiparos provided most Neolithic settlements with obsidian. As well, several other sources in Slovakia, Turkey, and on the Lipari Islands near Sicily are also considered plausible (Renfrew 1979:180). Other unique or local materials include the andesite found in the Saronic Gulf and the rare emory from Naxos (Demoule and Perlès1993:361).

Copper is also known from several parts of Greece, but its use is confined to the Final Neolithic phase of the Neolithic (McGeehan-Lintizis 1983; Stos-Gale and MacDonald 1991; Renfrew 1979:190, and n. 15). That the technology existed to create a controlled reducing atmosphere so the copper could be cast is not in question (Renfrew 1979:190), but it is really quite unknown if the copper of the Final Neolithic was made using these ore deposits or was imported from elsewhere (Demoule and Perlès1993:361). Similar questions surround the exploration of some gold and silver ore deposits by the end of the period (Gropengiesser 1990).

III. The Archaeology of the Neolithic

Summaries of the material culture and general historical outlines of the Neolithic are few, reflecting the amount of work done on this time period (Wace and Thompson 1912; Syriopoulos 1964; 1968; Theocharis 1967; 1970; 1971; 1977; Demoule and Perlés 1993). In this section I will review the current knowledge of the Neolithic by addressing major theories and interpretation of Neolithic material culture. However, I will focus upon current issues of debate, particularly those regarding explanations of culture change. Conclusions made in this thesis are directly related to the interpretation of culture change in the Aegean and the difficulties in distinguishing subtle changes and differences between the phases of the Neolithic.

A. Settlement

The majority of settlements dating to the Neolithic are open-air sites. Caves were also used, but mostly in later periods, and these may have had some specialized function. The "typical" settlement of the Neolithic is the farming village, ranging from only a few households to less than one hundred people (Fig. 5.4a). Many settlement sites seem to have been occupied for many centuries during the Neolithic, and permenance of settlement was definitely intentional.

This permenance is especially apparent in the settlement architecture. Buildings are typically not large, but do measure several meters square (Illus. 5.4a). Wood was a favoured building material at northern sites (such as Servia), providing a framework for mud-coated brush or reed walls and roofing. Floors are typically laid with wooden planks. Changes in material are apparent by the end of the period, with pisé (walls of mud in layers) or sundried bricks on low stone foundations becoming standard. Floors were made of stamped earth or sand, and thatched or brush roofs coated with plaster covered the structure.

The settlement plan is of two types: free standing houses or an agglomerative plan, typical of the Near East and the Early Bronze Age (Cosmopoulos 1991). Structures were single storied, but cellars have been reported in houses from Servia. Houses were either entered from a floor-level doorway (Illus. 5.5b-d), or were entered through the roof, probably by a ladder as in the Near East (Illus. 5.5a). Because of the types of building materials, the creation of mounds (Gk. *magoula*) is typical at these sites. The mud used to solidify the walls and roofs would eventually erode after numerous rainfalls. This would cause the floors to continually increase in height, slowly approaching the ceiling. Structures often would have to be rebuilt, abandoned, or leveled and a new structure put in its place. This pattern could help explain why a roof entrance was favoured at some sites. Halstead (1989) has argued that the size and plan of Neolithic settlements suggests they were used by nuclear families rather than extended families. However, the house groupings have not been systematically approached as a source of social data.

Cooking areas and storage pits orginally seem to be outside the domestic structure. Later in the Neolithic these features are found inside a courtyard or inside the house. Halstead (1989:72-77) has argued that these features could suggest a change in society, reflecting a weakening of the communal aspect and the pressure to share food, which was supposed to exist originally (as they assume an egalitarian type of society). However, as

Dickinson (1994:35) noted in his brief survey of the Neolithic, the variation in settlement architecture and planning between sites is little understood.

Another issue of some debate are the ditches or stone walls that surround some sites (such as Dhimini). It is improbable that these walls were used for defense purposes. Rather, they may reflect settlement divisions. Hourmouziadis (1979) has argued that these structures fall into discrete groupings of domestic complexes, whereas Halstead (1981b; 1989:76) suggests that the arrangement of the central court and "megaron" house at Dhimini, Sesklo, and other Thessalian sites, provide evidence of an established social hierarchy. These particular material features of the Neolithic period are purely a Thessalian development. This suggests a distinct cultural break between northern and southern Greece, but such conclusions cannot be reached on the cursory study of settlement evidence alone, and settlement pattern and mortuary evidence must also be taken into consideration (as McGuire 1983 suggests)..

B. Subsistence

The subsistence economy of the Neolithic was based upon agriculture and animal husbandry. Agricultural strategy in the Neolithic seems most likely to be designed around the risk of crop failure and sequence harvesting. The subsistence of the Greek Neolithic has its origins in an economic shift which occured around 7000 B.C.

This shift saw increased exploitation of the two major players in the subsistence economy, cereals and ovicaprids (sheep/goat), which were not indigenous to south-eastern Europe (Bökönyi 1979:167; Champion *et al.* 1984:118) (Cereals: Table 5.2). This type of subsistence economy is first attested in south-west Asia from the 9th to the 8th millennia, and it is unlikely that Greece or any other region in south-eastern Europe proceeds this (Bökönyi 1979:167).

1. Agriculture

In the Neolithic period early forms of wheat, the glume wheats of einkorn (*Triticum monococcum*) and emmer (*Triticum dicoccum*), were preferred over bread wheats (except wild barley, *Hordeum spontaneum*) mainly because they were more resistant to disease and infestation. They also require less nutrients and water requirements (Hansen 1988), and can be stored in spikelet form (Halstead 1989a). Furthermore, the free-threshing bread wheat *Triticum aestivum* is very rare on the mainland, but far more common at Knossos on Crete (Kroll 1991; Hansen 1988). The only improvements that can be recognized in agriculture throughout the Neolithic is the introduction of six-row barley (*Hordeum vulgare*), replacing two-row (*Hordeum distichum*) (Dickinson 1994:35; Bottema 1977). This advantageous change in strategy and barley species would have created a higher yield, but placed almost the same stress on the soil.

	Settlement													
	ca. 6000-5000 bc						*ca.* 5000-4000 bc							
Plant	5	6	7	8	9	10	11	12	13	14	15	16	17
Einkorn	X		X		X	X	X	X	X	X	X	X	X
Emmer	X	X		X	X	X	X	X	X	X	X	X	
Bread-wheat						X			X	X	X		
Barley	X	X		X	X	X			X	X	X		
Vetch	X				X				X	X	X		
Lentil	X				X		X	X	X	X	X		X
Pea	X	X			X				X	X	X		
Flax									X	X			
Cornelian cherry					X				X	X	X		
Apple									X	X	X		
Blackberry									X	X			
Walnut										X			

Table 5.2.** Principle plants represented on sites in South-east Europe from the sixth to fourth millennia. Source Champion et al. 1984:119; Dennell 1978.* ***Greece: *(5) Ghediki 6-5000 (Renfrew 1973); (6) Sesklo 6-5000 (Renfrew 1973); (7) Achilleion 6-5000 (Renfrew 1973); (8) Argissa 6-5000 (Hopf 1962); (9) Nea Nikomedia ca. 5500 (van Zeist and Bottema 1971).* **Crete:** *(10) Crete ca. 6000 (Evans 1968).* **Bulgaria:** *(11) Azmak ca. 5000 (Renfew 1973); (12) Karanovo ca. 5000 (Renfrew 1969); (13) Chevdar ca. 5000 (Dennel 1978); (14) Kazanluk ca. 5000 (Dennel 1978).* **Serbia/Bosnia:** *(15) Anza ca. 5000 (Gimbutas 1974); (16) Vrsnik ca. 5000 (Garasanin, M. and D. 1961); (17) Selevac 5-4000 (Late Vinça) (Hopf 1974).*

Domesticated legumes were also grown in the Neolithic. These are more difficult to grow than cereal crops, but add variety to the diet and can be used to reknew soil nutrients. Domesticated legumes consisted mainly of pulses, such as lentils (*Lens culinaris*), peas (*Pisum sativum*), and bitter vetch (*Vicia orvilia*). Only in Thessaly are grass peas (*Lathyrus sativus*) known to have been cultivated, and only in the Late Neolithic phase are chickpeas (*Cicer arictirum*) and horsebeans (*Vicia faba*) accounted for in the record. Olives are rare and pits have only been found at a few sites (Runnells and Hansen 1986), and even these appear to be wild. The vine is also quite rare during the Neolithic, but is more common than the olive, and in Hansen's opinion (1989), they are too small to be cultigens.

2. Animal Husbandry

The faunal remains of sheep (*Ovis aries*) and goat (*Capra hircus*) dominate the livestock pattern of the Neolithic, with cattle (*Bos taurus*, *Bos primigenius*) and pigs (*Sus scrofa*) present only more rarely (Table 5.3). For Greece, Halstead (1981a; 1987; 1989:70-71) has followed Sherratt (1981) in suggesting an interesting but controversial model based on the idea that sheep and goats were utilized primarily for secondary products (milk, wool, and traction), and that this formed an integral part of the farming system. Halstead has envisioned the livestock, particularly sheep, pastured on the stubble and fallow areas of small fields where cereals and pulses were grown in rotation or alternating fallow periods. The sheep would not only aid in turning the fields, but fertilize them as well. Such a system would maintain the productivity of the fields for a long time, and therefore contribute to the longevity of the settlements. The small scale of the settlements and the available work force also seem to support such a model.

Along with Halstead and Sherratt, other papers on the topic (e.g., Chapman 1982; Sherratt 1983; Ryder 1984; Bogucki 1984) also claimed to realize a Secondary Products Revolution in Mesopotamia, Egypt, and Central Europe from the late 4th to the 1st millennia B.C. However, these conclusions were based upon artifactual and not faunal evidence, which has only recently gained a more central place in the debate (Greenfield 1988). Analysis of faunal data from excavations just north of Greece in Serbia (Greenfield 1988), at Sitagroi-Photolivos (Bökönyi 1977:175) in the Cyclades, and recently at Tharrounia on Euboea (Kotjabopoulou and Trantalidou 1993) and Megalo Nisi Galanis in Macedonia (Greenfield and Fowler, in preperation), support the notion of a classic meat-producing strategy, rather than a focus on milk, wool, horn, or traction. [3] This strongly suggests that primary animal products, such as meat, bone, and hide, were the principle motivation in the Greek Neolithic agricultural pattern (cf. also Champion et al. 1989:130).

Site	Sheep	Goat	Sheep/ Goat	Cattle	Pig	Red Deer	Roe Deer	Dog	Cat
EN									
Argissa *	X	X		X	X	X	X		
Nea Nikomedia*	X	X		X	X	?		?	
Knossos*	X	X		X	X			X	
Chevdar	X	X		X	X	X	X	X	X
Kazanluk	X	X		X		X	X	X	X
Anza	X	X	X	X	X	X	X	X	
Lepenski Vir			X	X	X	X	X	X	
LN (Greece)									
Tharrounia	X	X	X	X	X	X	X	X	
Agios Dimitrios	X	X	X	X	X	X	X	X	
Agio Sofia	X	X	X	X	X	X	X	X	
Argissa	X	X	X	X	X	X	X	X	
Dimini	X	X	X	X	X	X	X	X	
Peukakia	X	X	X	X	X	X	X	X	
Platia M. Zarkou	X	X	X	X	X	X	X	X	
Thermi	X	X	X	X	X	X	X	X	
Dimitra	X	X	X	X	X	X	X	X	
Sitagroi	X	X	X	X	X	X	X	X	
LN-FN (Greece)									
Megalo Nisi Galanis	X	X	X	X	X	X	X	X	

*Table 5.3. Principle animals represented on Neolithic sites in south-eastern Europe and Greece. Those EN sites marked with * are located within the current political boundaries of Greece. Source: Champion et al. (1989: Table 5.3); Kotjabopoulou and Trantalidou 1993:Table 10; Greenfield and Fowler, in preperation.*

C. Technology and Crafts

The range of crafts practiced in Neolithic communities is far wider than previous periods. It is commonly assumed that individiuals would have knowledge and competence in a variety of crafts. However, the production of certain implements and ornaments would have required specialized skills.

Stone-working became a skill that expanded the toolkit from chipped or ground stone (Illus. 5.6, 5.7) to include other rock types in making querns, vessels, figurines, beads, pendants, and other ornaments (Illus. 5.8). Clays were widely used for similar items, as well as for the so-called "sling bullets," spindle whorls, loom weights, stamp seals, and most commonly, pottery. The more easily worked bone and horn were often used for implements requiring a sharp point, such as antlers for picks or digging sticks (Illus. 5.7). Shell, particularly *spondylus*, was also utilized, but this specifically for ornamentation. It is expected that many organic materials that have not survived were also used; there is only evidence from impressions on pottery that matting, wickerwork, and textiles were distinct crafts in the later Neolithic. Wood was also a widely used building material, as noted above, and must have been utilized for other items. As well, Barber (1991:Chapter 10) has noted that colored earth, vegetables, and minerals, could have been used to provide a wide variety of dyes and paints.

Further evidence of developing craft specialization comes from the technical skill of metalworking, which appears long before the Bronze Age. The skill of metalworking was one that especially required expert knowledge of metal ores, smelting, and casting. The earliest items produced consist of small copper ornaments and implements, such as flat axe-heads. However, gold and silver ornaments have also been discovered, and at Kephala on Kea, both copper and lead have been found (Coleman 1977). Most metal items originate from northern Greece, and it is likely that there would have been few metallurgists practicing the craft at its inception. Furthermore, one can speculate that these early practitioners of metalworking grew out of the established craft of potting. At this time, only experienced potters would understand the elements necessary to experiment with ores, such as firing temperatures, composition of clays (which have a high mineral content in Greece; cf. Jones 1986: Chapter 4), and casting from clays.

At the beginning of the period, potting itself was still a rather crude craft, with rudimentary techniques and little knowledge of clay composition (Illus. 5.9-5.12). This coincides with the low level of production in the intial phases of the period, and the simple range of shapes and decoration. However, after the development of more specialized equipment and kilns (Jones 1986:773-777) during the Late Neolithic (4900-4100 B.C.), the common bowl and jar shapes were expanded, lugs for transport and suspensions were added, and appliqué, incision, impression, and various paints were used for decoration. Some pots seem to have been decorated individually, regardless of the notable increases in production, and this specific attention emphasizes more specialized functions for this pottery. On the other hand, common, domestic wares have far thicker walls, more tempering materials, and have heavy burnished dark-colored slips. This distinct difference in pottery types only appears towards the end of the period, showing us a combination of practicality and artistry and the high quality the craft had reached.

D. Trade and Exchange

There is good reason to suppose items were exchanged during the Neolithic period. In partiuclar, lithic products and materials from a variety of sources are found throughout the Aegean. One would expect this exchange to involve mechanism such as social alliances (Cullen 1985) and direct distribution by specialists (Demoule and Perlés 1993). It is even tempting, though speculative, to envision networks of gift exchange behind the distribution of unusual artifacts, as is attested ethnographically (e.g., Malinowski 1922), although direct analogy with the Polynesian *kula* is suspect (Greenfield 1991). Contacts documented for the Neolithic Aegean cover extreme distances: for example Aegean and Black Sea *spondylus* shells have been documented in sites along the Danube area (Renfrew 1972:444) (Illus. 5.13), and a gold strip from the Cave of Zas on Naxos has been paralleled to those found in Macedonia and the rich Varna cemetery in Bulgaria (Zachos 1990:30). As well, Melian obsidian has been documented from sites all over the Aegean, including inland sites (Renfrew 1979) (Illus. 5.14). Earlier in the Neolithic, obsidian may have been a commodity for exhange, almost in a commercial sense, but in the later phases Perlés suggests that at least in the coastal regions it was procured in raw form and worked locally (1990:28-34).

All in all, the relationships between settlements is not well known. There is little evidence to suggest that territory was marked or even a matter of dispute. There is no preoccupation with defense, and few remains of weapons have been discovered, save those that could have functioned as hunting implements (projectile points and "sling bullets"). However, some consider it reasonable to see rivalry and competition for resources as being ritualized, considering the proximity of settlements and rising populations in circumscribed environmental niches (cf. Orme 1981:198-199; Demoule and Perlés 1993).

IV. Mortuary Analysis in the Aegean: Previous Work

There has been little work done in the Aegean beyond a basic description of the burials themselves. This has established a knowledge base consisting of patterns of burial customs. The purpose of these studies was to identify chronological and cultural affiliations. Therefore, generalizations made on the associations of burial customs constitute the majority of the knowledge of burial practices in the Greek Neolithic and Early Bronze Age.

Much of the mortuary data was often collected under less than auspicious circumstances, and therefore, there is a lack of very basic documentation on the graves. Often there is no record of the associated grave goods, features of the graves, or even the precise number of interments represented at the site. Poor excavation and non-systematic and non-problemic oriented approaches to retrieval also greatly hamper mortuary analysis in the Aegean (Pullen 1985:95). This, then, leaves the reasearcher with a very small data base to work from, and even in the "best" cases there is essential information absent in excavation record.

A. Research into the Greek Neolithic Period

What is typically taken as characteristic of the Aegean EBA mortuary practices (Pullen 1994) has been shown to be quite uncharacteristic of the preceeding Neolithic period. As outlined in Chapter 1, there are few known burials for the Neolithic (estimated at no more than 300 individuals for a 3000 year span). However, as I have shown earlier, much basic work still needs to be done in regards to updating the interpretive frameworks for studying human osteological collections from Greece, and mortuary studies are further hampered by some early archaeologists practicing non-systematic and non-problem oriented fieldwork. In this study, however, there is the advantage of working with some previously unpublished data, and perhaps more importantly, there certain technological resources used in this thesis that were previously unavailable to previous researchers.

One of the most heralded sites of the Greek Neolithic is certainly Franchthi Cave. Conclusions made by Jacobsen and Cullen on the burials at Franchthi Cave suggest little social stratification, with distinctions in mortuary ritual primarily being made according to age and sex and perhaps occupation (i.e., horizontal social differentiation) (1981:95). This conclusion was based upon objective observations of energy expenditure exerted in the making of the grave, and upon the age/sex ratio. Most important in the study by Jacobsen and Cullen is that they viewed the mortuary data from Franchthi Cave in light of what is known of Greek Neolithic burials. What they did not do, however, was explain the social significance of the conclusions, or relate in detail how these findings form a trajectory relating to the historical development of society in the Neolithic. The same fault can be leveled against Pullen (1985), who did little to compare the EBA to the Neolithic, and primarily used the Franchthi Cave excavations in highlighting developments in the Neolithic period (see especially 1985:52-53, 102-105). Furthermore, neither of the studies considered these developments in terms of the FN-EBA transitional phase, unlike Renfrew, who at least recognized change in agriculture, settlement organization, burial, and technology, which, incidently, define the Final Neolithic period (Renfrew 1972:77-80).

The fundamental problem I see with previous work done on the mortuary data from Greece, is a weakness in both theoretical perspective and operational methodological framework. It is for this reason that authors have focused upon issues that are not really relevant to mortuary data itself, or what can be done with mortuary data. In other words, many questions have been asked of the Greek mortuary remains, which, considering the theoretical and methodological frameworks used at present, they are just not able to answer. To exemplify my point, I would like to highlight two such issues that seem to be of some concern to classical scholars working in this time period with this data.

One issue that seems of some concern to those who study burials in Greece is the practice of secondary burial. Secondary burial is usually understood as a two-stage process of the mortuary program: it is when the body is prepared in a variety of fashions, such as being buried then the bones are dug up, and then the body is readied for interment in the final resting place. Numerous papers written on the Greek mortuary data often discuss secondary burial at the expense of many pages. In Greece, this practice is understood as being a "normative" burial practice, or the common way in which the dead are prepared for final burial (Jacobsen and Cullen 1981:86). It is also generally understood as the process by which subadults and adults were buried. However, if one looks at Franchthi Cave data (Table 5.3), one finds a large degree of uncertainty surrounding the classifications. At Franchthi, only 35% of the burials dating to the Neolithic were positively classified as secondary burials (24% unsure), and all of these were adults! It would seem, then, that primary burial is also a "normative" burial practice at Franchthi.

Fr Number	Date	Age	Interment Type
11	EN	Juvenile	Primary
12	EN	Juvenile	Primary
18	MN?	Adult	Secondary
19	FN	Adult	Secondary
31	EN/MN	Adult	Secondary?
48	EN	Infant	Primary
59	MN	Adult	Secondary
61	FN	Adult	Secondary
62	FN	Adult	Secondary
63	FN	Adult	Secondary
66	EN	Infant	Primary
69	FN	Juvenile	Secondary?
103	EN	Infant	Primary
104	EN	Infant	Primary?
105	EN	Infant	Primary?
106	EN	Infant	Secondary?
115	FN	Juvenile	Secondary?

Summary Statistics: n = 17 burials

	Classification		
Reliability of Observation	*Primary*	*Secondary*	*Total*
Positive:	29%	35%	64%
Questionable:	12%	24%	36%
Total	41%	59%	100%

Figure 5.1. *Franchthi Cave burial data with summary statistics on the occurrence of primary and secondary burials. After Jacobsen and Cullen 1981:85: Table 1.*

In the discussion that makes up the following chapters, instead of debating whether of not secondary burial was actually part of the mortuary program (i.e., questions of typology), I rather focus attention on what this variation on an inhumation form of interment *means* in terms of social differentiation. An understanding of the variability in the mortuary program has a direct influence upon the calculations of energy expenditure. I stress here *calculations* of energy expenditure, as the idea was proposed by Jacobsen and Cullen (1981:91), but was not arrived at by any apparent method, and the progenitor of this method for mortuary analysis, Joseph Tainter, was not consulted by Jacobsen and Cullen.

Another issue that has been raised using Greek mortuary data is the question of gender. In particular, Cullen and Talalay raised this issue in a paper they recently delivered (1995:333). My concern with approaching a topic such as this in archaeology is not with the topic itself, but what the results of such a study are going to be used to investigate: domestic production, occupational specialization, etc. In the abstract of thier paper Cullen and Talalay wrote that

> [...] males are not as visible as females in either figurine or funerary samples. Our attempt to relate this observation to gender distinctions in Neolithic Greece is complicated by the symbolizing aspects of mortuary ritual and figurine imagery, and raises critical questions about the feasibility of recovering gender from the archaeological record (1995:333).

From this it is apparent that it is neither the existence of gender differences nor the viability of recovering gender distinctions in the Neolithic that are actually the issue.[4] It is rather one of having a theoretical and methodological framework within which to interpret the "symbolizing aspects of mortuary ritual and figurine imagery." To this end, the focus of the present thesis is upon such symbolizing aspects in mortuary ritual. And perhaps a further contribution can be made towards "recovering gender in the Greek Neolithic" by concentrating on understanding how differences in the mortuary program between men and women relate to thier roles within the society they lived, rather than the plain materially diagnostic or symbolic differences between men and women.

Notes to Chapter 5

[1] Milojcic pursued work in Greece mainly because he was operating on the assumption that cultural traits from the Near East diffused westward into Europe. By showing that an "aceramic" phase also existed in Greece, at a later time than in the Near East, Milojcic hoped to support the theory of a direct diffusion of culture from the Near East. Diffusionism was the prevelent theory at the time, and numerous other researchers were working under the same framework (see below, The Archaeology of the Neolithic).

[2] The information in this section is largely derived from my work on the Oropos Ethnoarchaeological Study, a pilot project of the University of Manitoba Oropos Survey Project. This research has been summarized in a report to Dr. Michael Cosmopoulos, director of OSP (see Fowler 1995).

[3] In her paper in Theocharis (1977), Bökönyi (1977:168) argues that animals were used for both primary and secondary products, but does prepare the reader to expect a Secondary Products Revolution in the Early Neolithic (1977:168). There is some confusion in her numbers however, when she states that in the EN about 40% of ovicaprids and bovines were killed for meat, a primary product (1977:168). By the LN almost 17% of ovicaprids and up to 75% of bovines were killed for their meat. These numbers are consistent from the finds at Megalo Nisi Galanis (Greenfield and Fowler, in preperation), and from the recent excavations at Tharrounia (Kotjabopoulou and Trantalidou 1993:405). This suggests that only by the end of the Neolithic were certain animals, at certain locations, beginning to be exploited for some secondary products.

[4] A recent paper by Meiklejohn, Petersen, and Alexandersen (1996, in press), has addressed the issue of recoving gender from the archaeological record. One of the major stumbling blocks they see in the interpretation of gender from mortuary data is that

> only one of these two definers, *sex*, is, by and large, a biological given. The other, *gender*, is a social category that includes elements beyond the biological. While there is considerable overlap in the categories, they are not always congruent. Lack of full congruency may involve either biological and/or cultural variables.

The authors go on to say that even to derive biological sex is not a given. Therefore, how to define "gender" in terms of culture in even more problematic.

Illustration 5.1. Map of the study area showing the regions and islands discussed in the text.

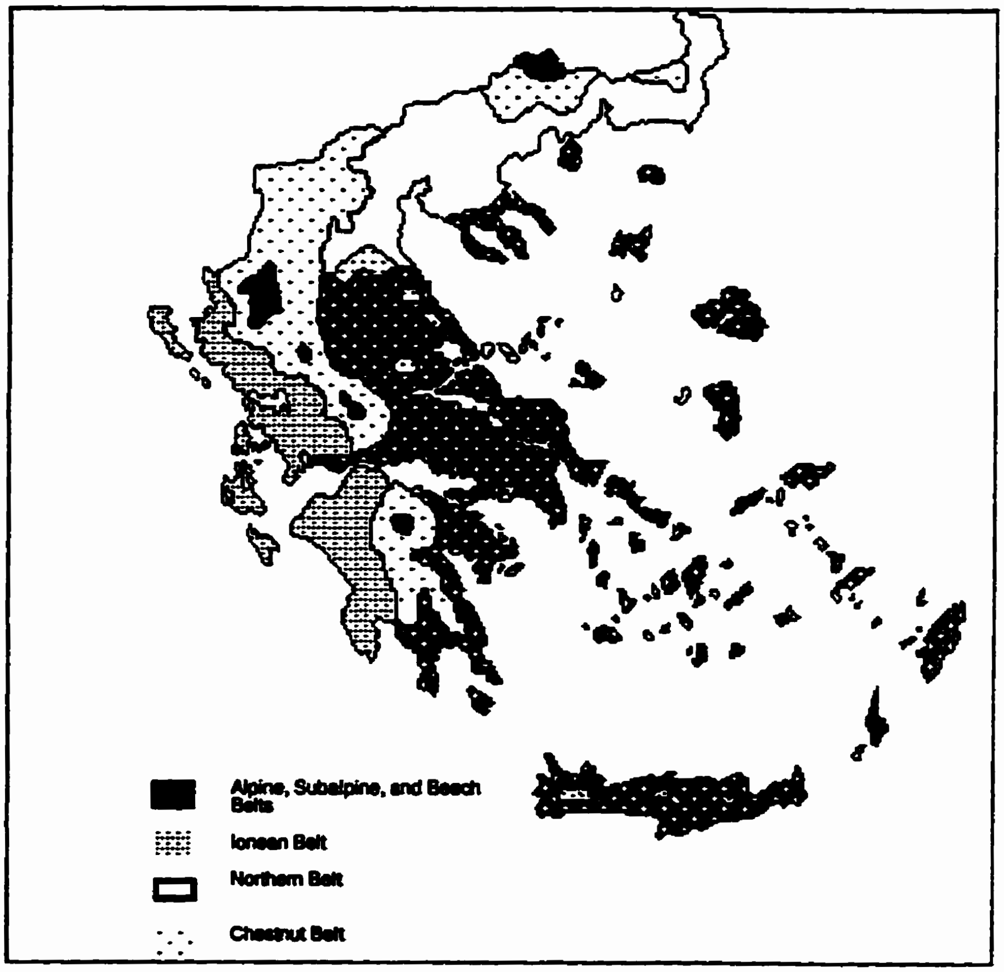


Illustration 5.2. Distribution of vegetational zones throughout Greece. Source: Bintliff (1977:110); Anastassiades (1949).

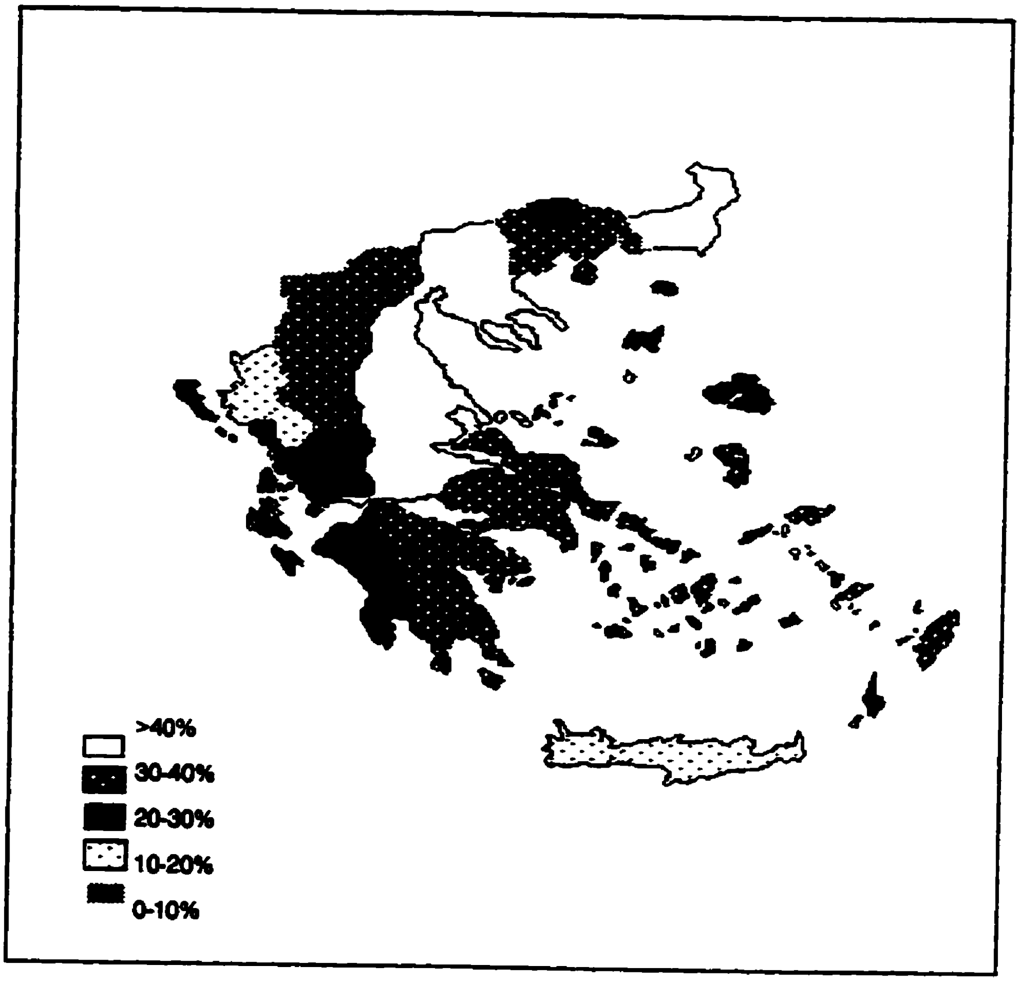
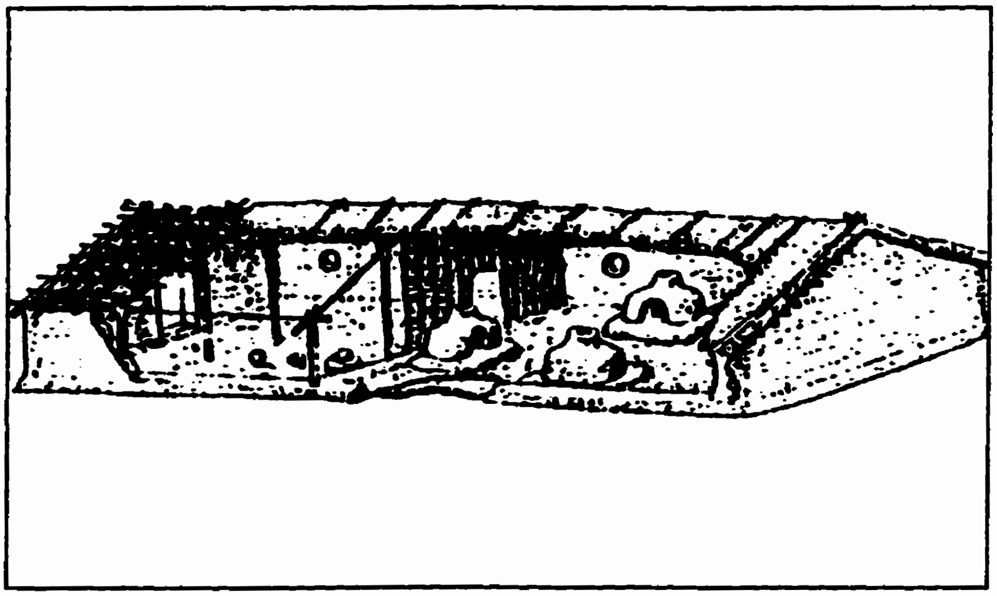


Illustration 5.3. Distribution of cultivatable land in Greece. Based upon J. Renfrew (1977:150).

A



B

Illustration 5.4. Examples of settlement and houses during the Neolithic in Western Europe: a) reconstruction of neolithic settlement at Aichbül; b) reconstruction of dwelling of the Tiopolje culture, Balkans. Source: Theocharis 1977.

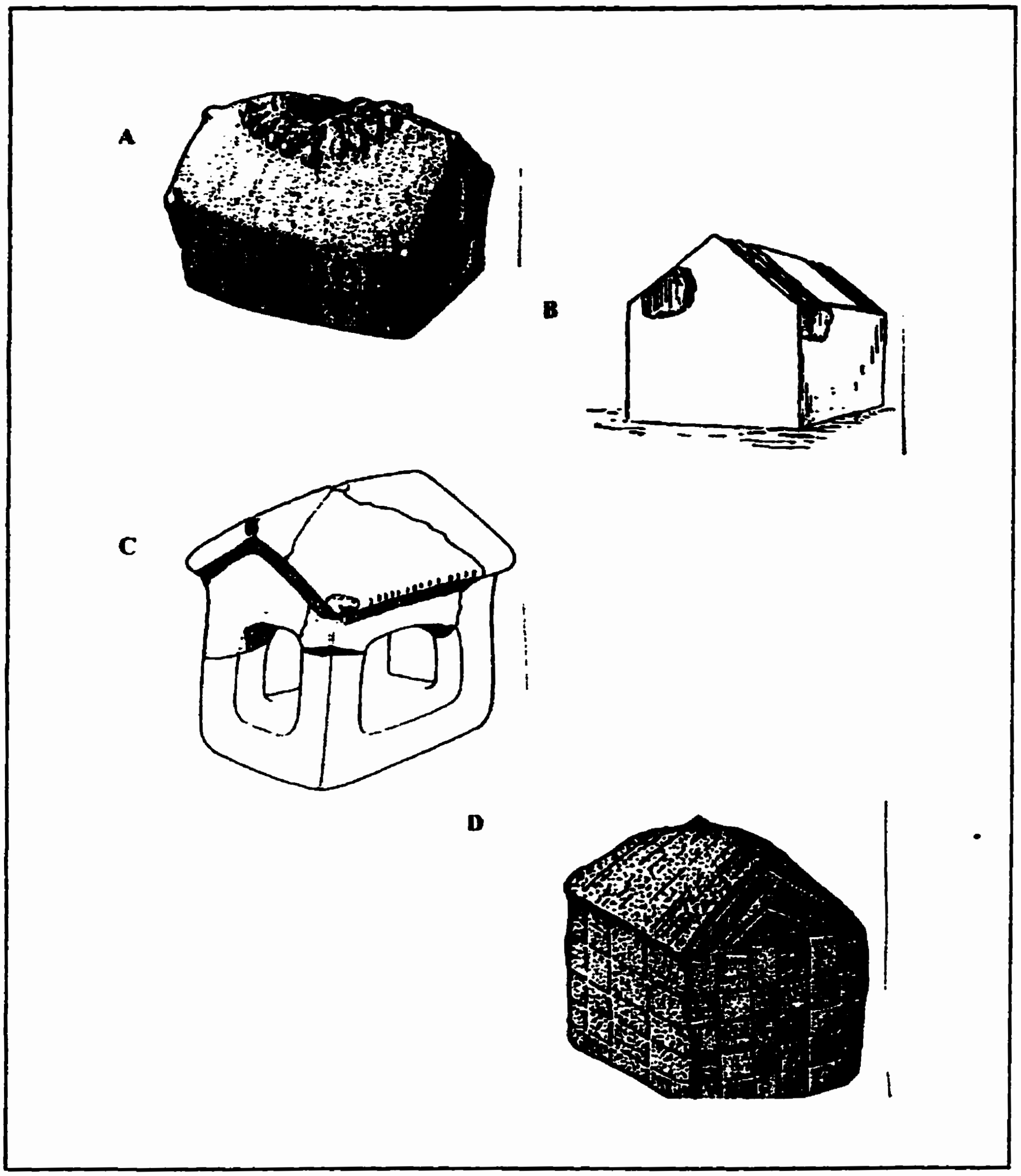


Illustration 5.5. Neolithic clay house models and reconstruction from Greece and the Balkans: a) clay house model from Proodin, Balkans, b) reconstruction of hut from Sesklo; c) reconstruction of clay house model, Greece; d) clay house model from Romania, provenience unknown. Source: Theocharis (1977:323).

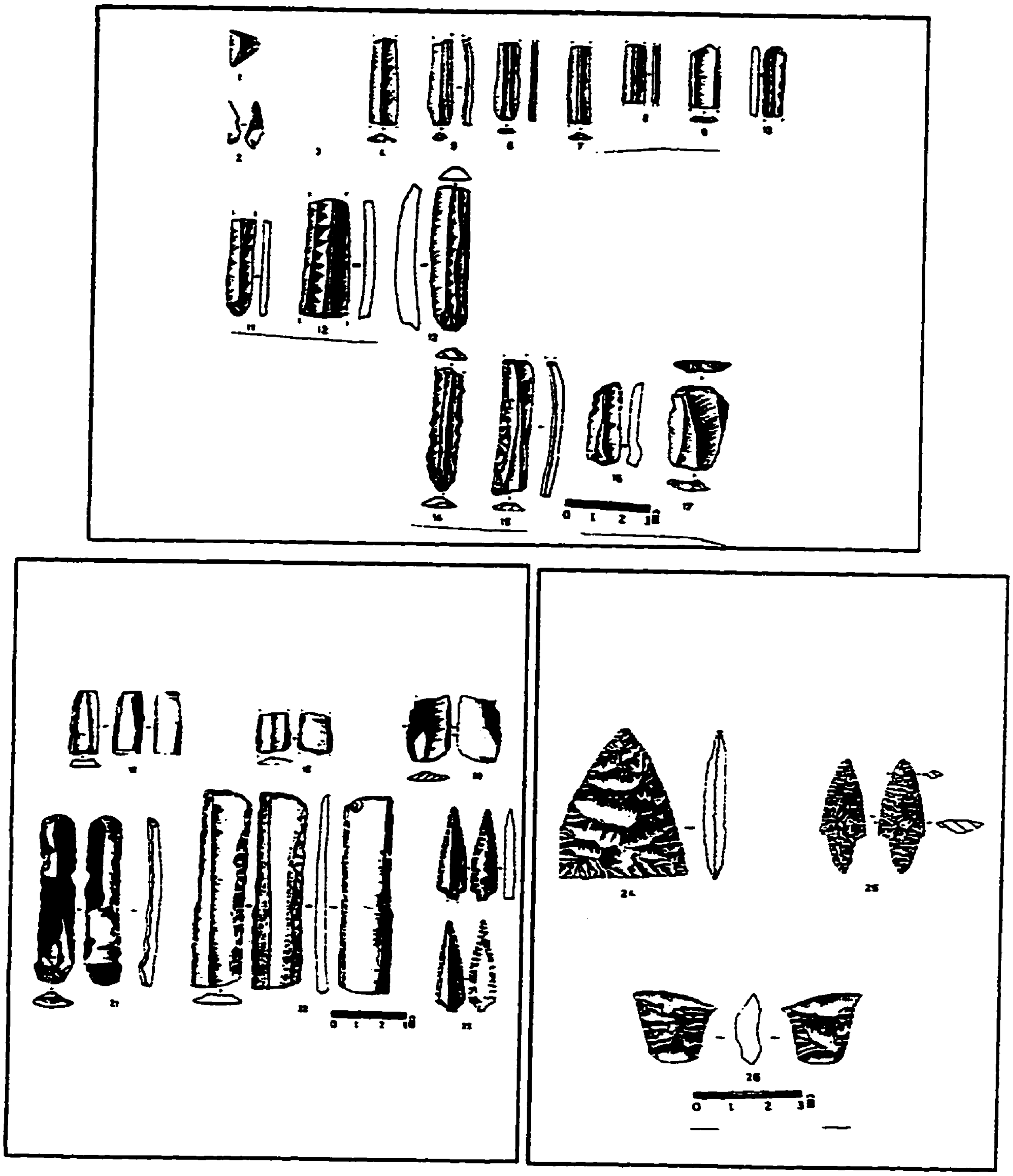


Illustration 5.6. Neolithic chipped stone tools. Franchthi: (1) EN, jasper; (2) EN, flint; (10) EN, obsidian; (16) LN, obsidian; (18-20) N, honey flint; (22) MN, honey-flint; Agrissa: (11, 13) EN, obsidian; (12) EN, honey-flint; Tharrounia (3-9, 14-15, 17, 25) LN/FN, obsidian; (21) LN/FN, jasper. Source: Demoule and Perlès (1993:372-374).

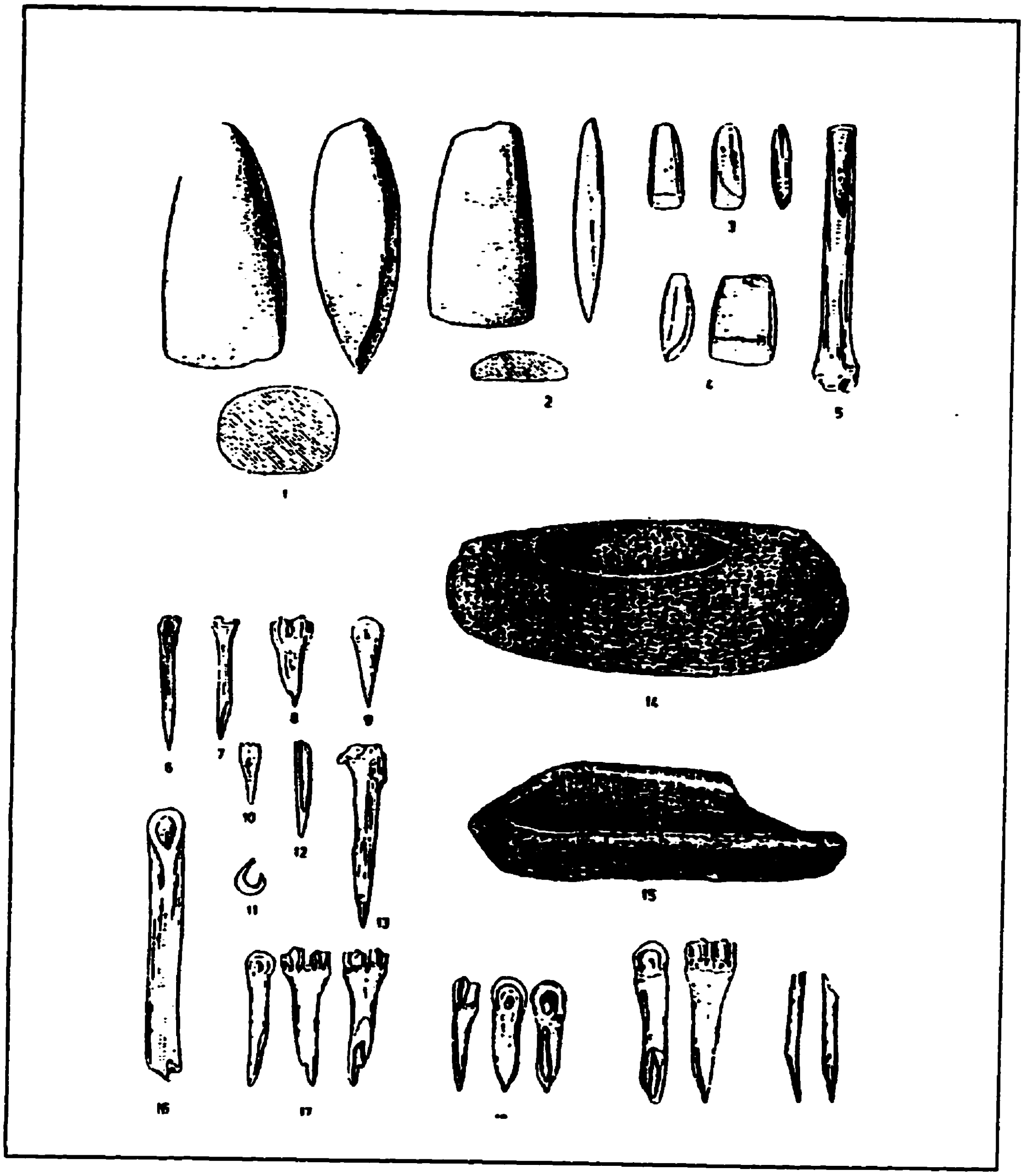


Illustration 5.7. Neolithic stone and bone implements. Seskio: (1,2,14,15) (Tsountas 1908); Achillieon, MN, (Gimbutas et al. 1989); Franchthi: EN-MN (5,10,12,13) (Jacobsen 1976); Saliagos: LN, (17-20) (Evans and Renfrew 1968). Source: Demoule and Perlés (1993:371).

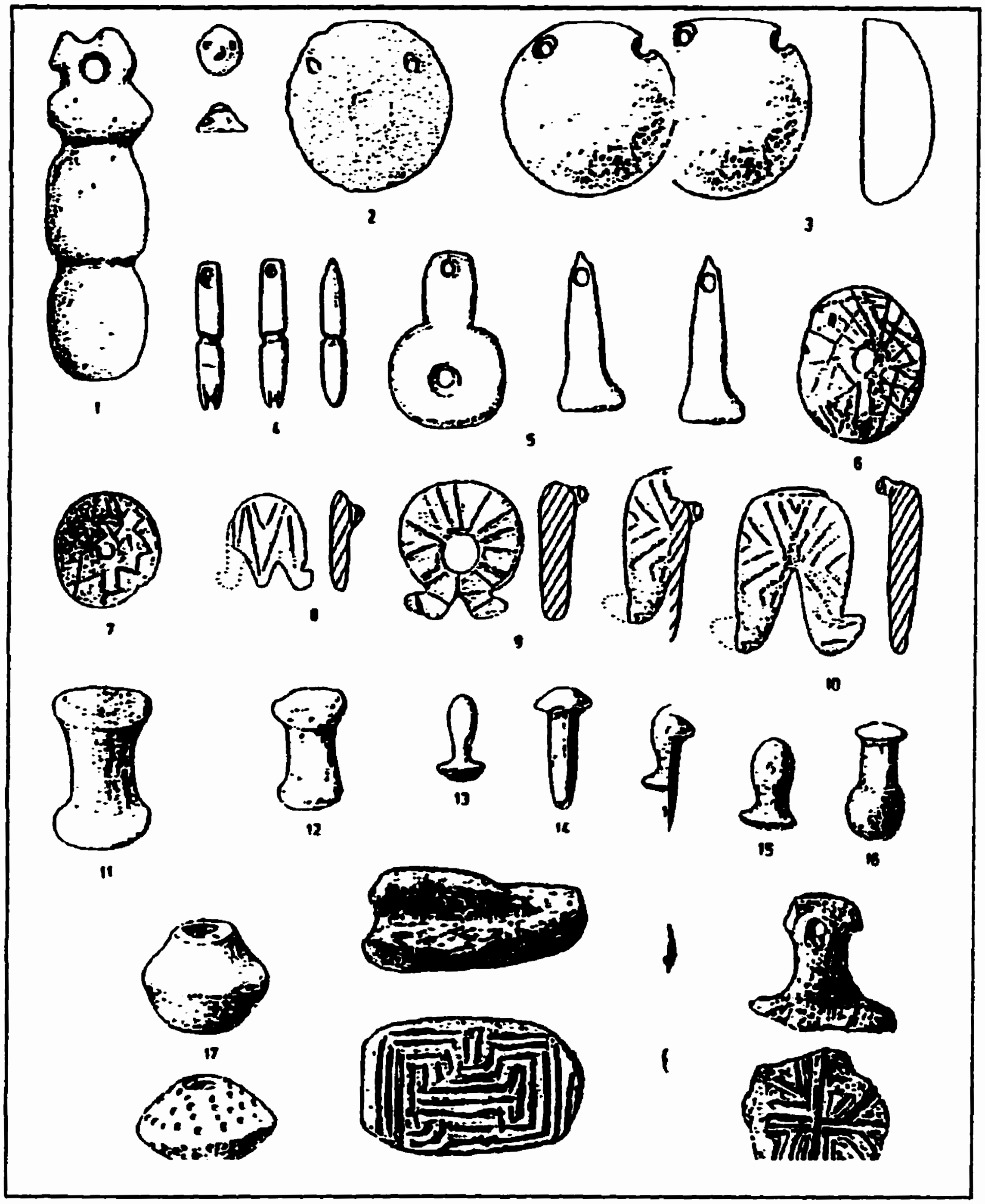


Illustration 5.8. Neolithic pendants, ornaments, seals, ear plugs, and clay spools: Achilleion: (1) MN, alabaster (Gimbutal et al. 1989); Franchthi: (2,3,8-10) MN, stone (Jacobsen 1976); Saliagos: (4) LN, green stone (Evans and Renfrew 1968); Sesklo (5-7, 11-20) all phases, various materials (Tsountas 1908). Source: Demoule and Perlès (1993:369).

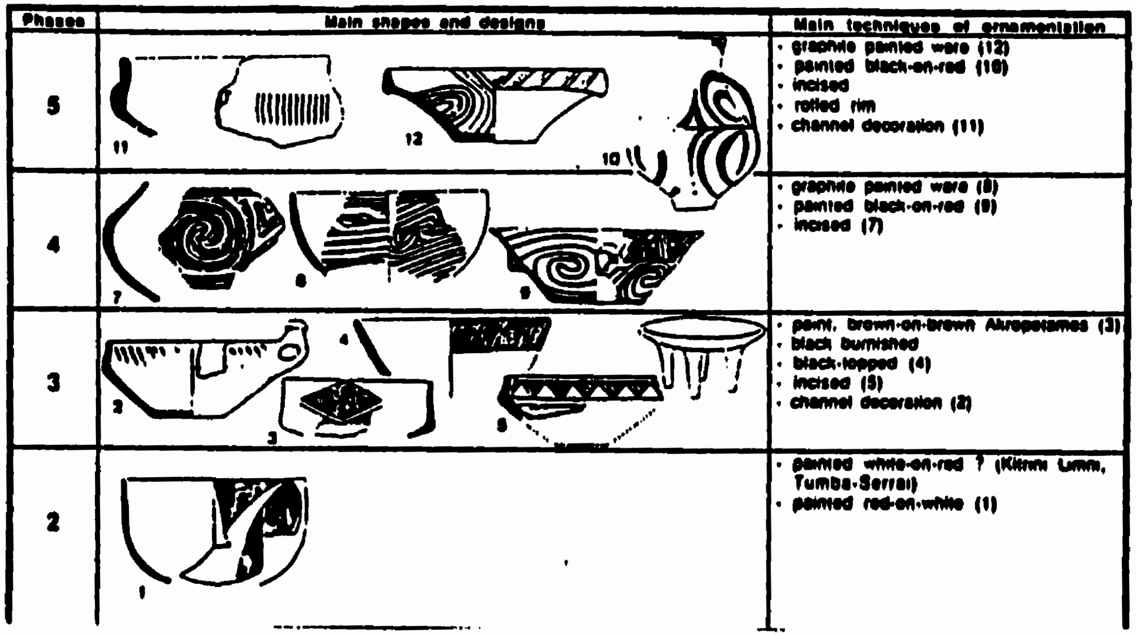


Illustration 5.9. Typochronology of ceramics in Macedonia and Thrace. Nea Nikomedia (1); Paradimi (2, 5, 6); Milopotamos (3); Sitagroi (4, 7, 9-12); Dikili Tach (8, 9). Source: Demoule and Perlès 1993:376). Phases: 1=EN, 2=MN, 3=LN1, 4=LN2, 5=FN.

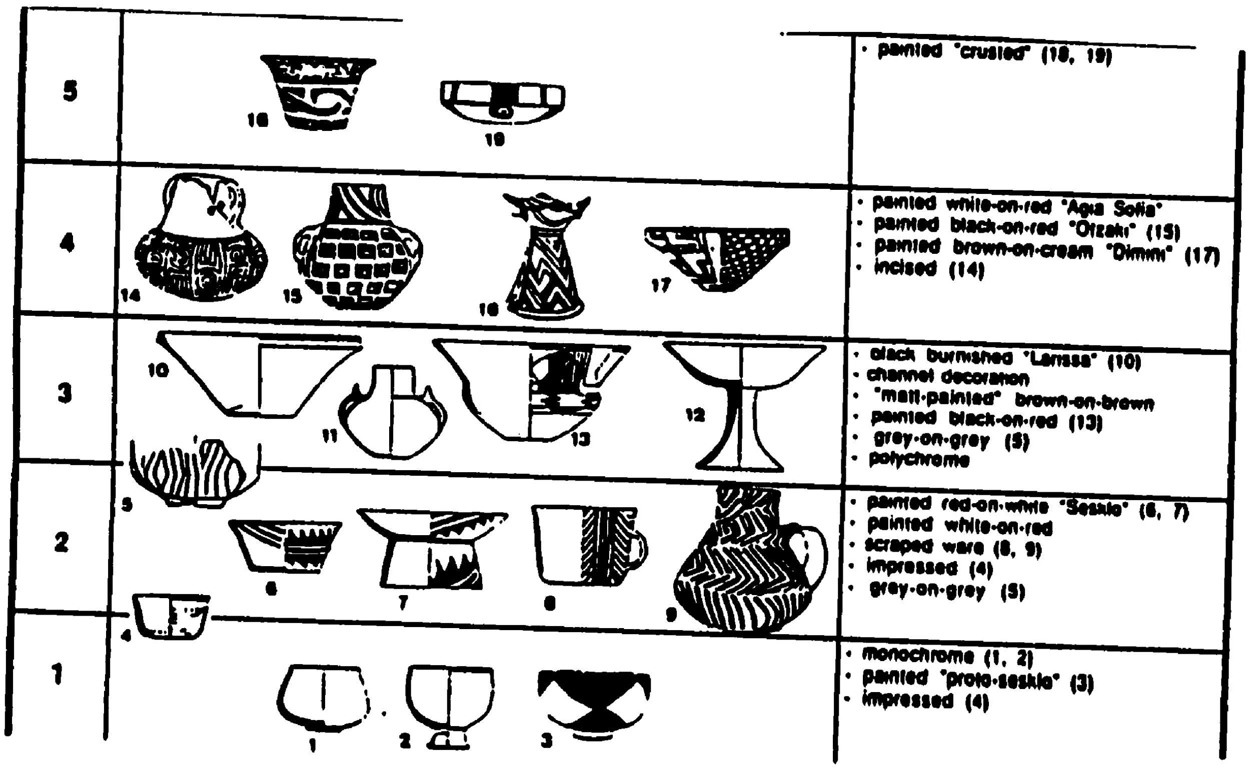


Illustration 5.10. Typochronology of ceramics from Thessaly. Otzaki (1-3, 6-8, 13, 15); Plateia Magoula Zarkou (5); Arapi (10, 12); Dhimini (14); Sesklo (17); Rachmani (18, 19). Source: Demoule and Perlès 1993:378. Phases as per Illus. 5.9.

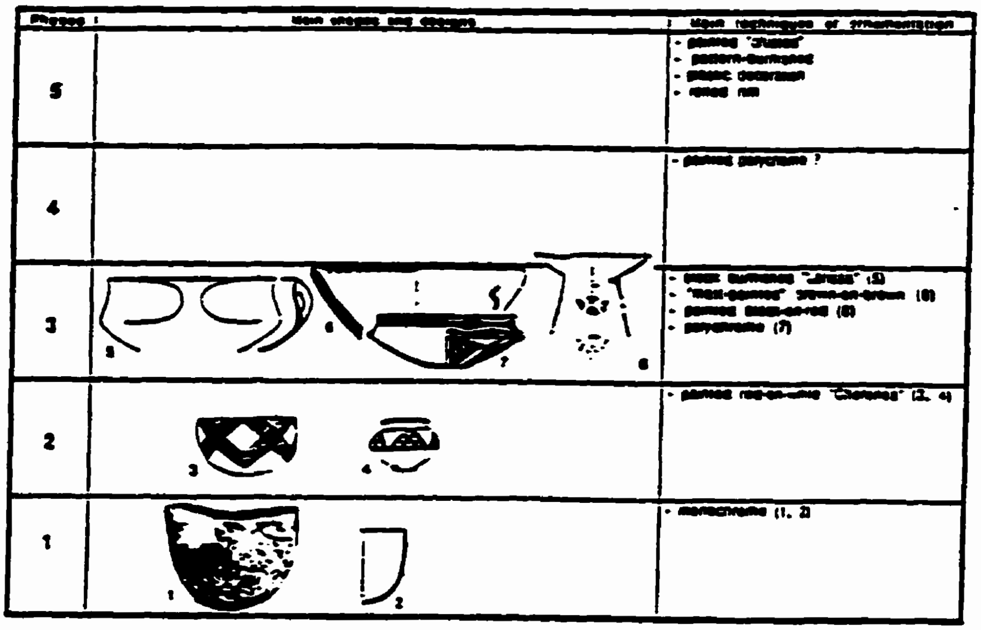


Illustration 5.11. Typochronology of Neolithic ceramics from Central Greece (Boeotia, Argolid). Chaeronia (1,3,4); Elateia (2,5,8); Kitsos Cave (6); Antre Coryeien (7). Source Demoule and Perlès 1993:379. Phases as per Illus. 5.9.

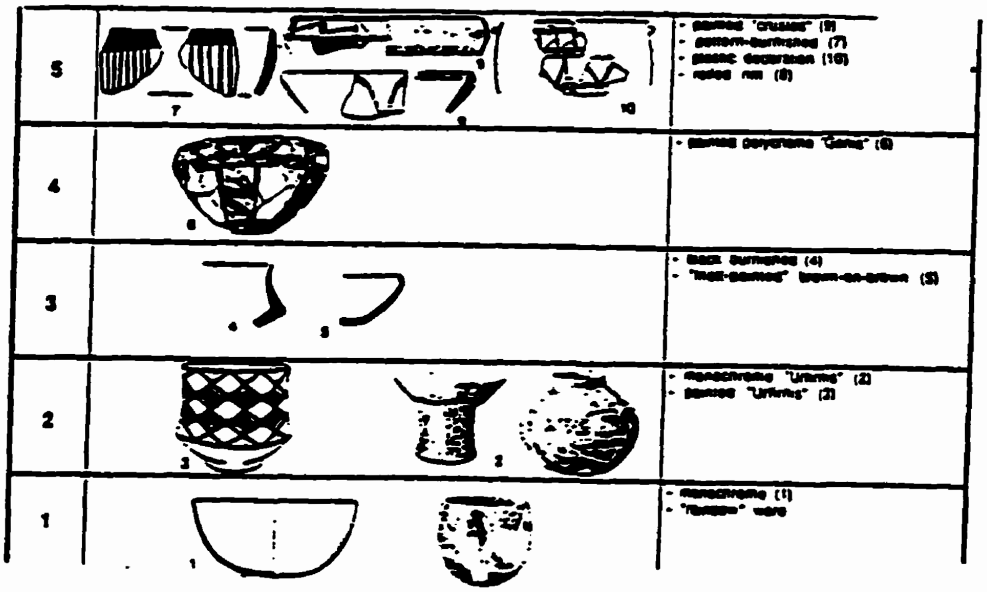


Illustration 5.12. Typochronology of ceramics from Southern Greece (Peloponnese). Franchthi Cave (1,2,4,5); Lerna (3); Prosymna (6), Agios Dimitrios (7-10). Source: Demoule and Perlès (1993:380). Phases as per Illus. 5.9.

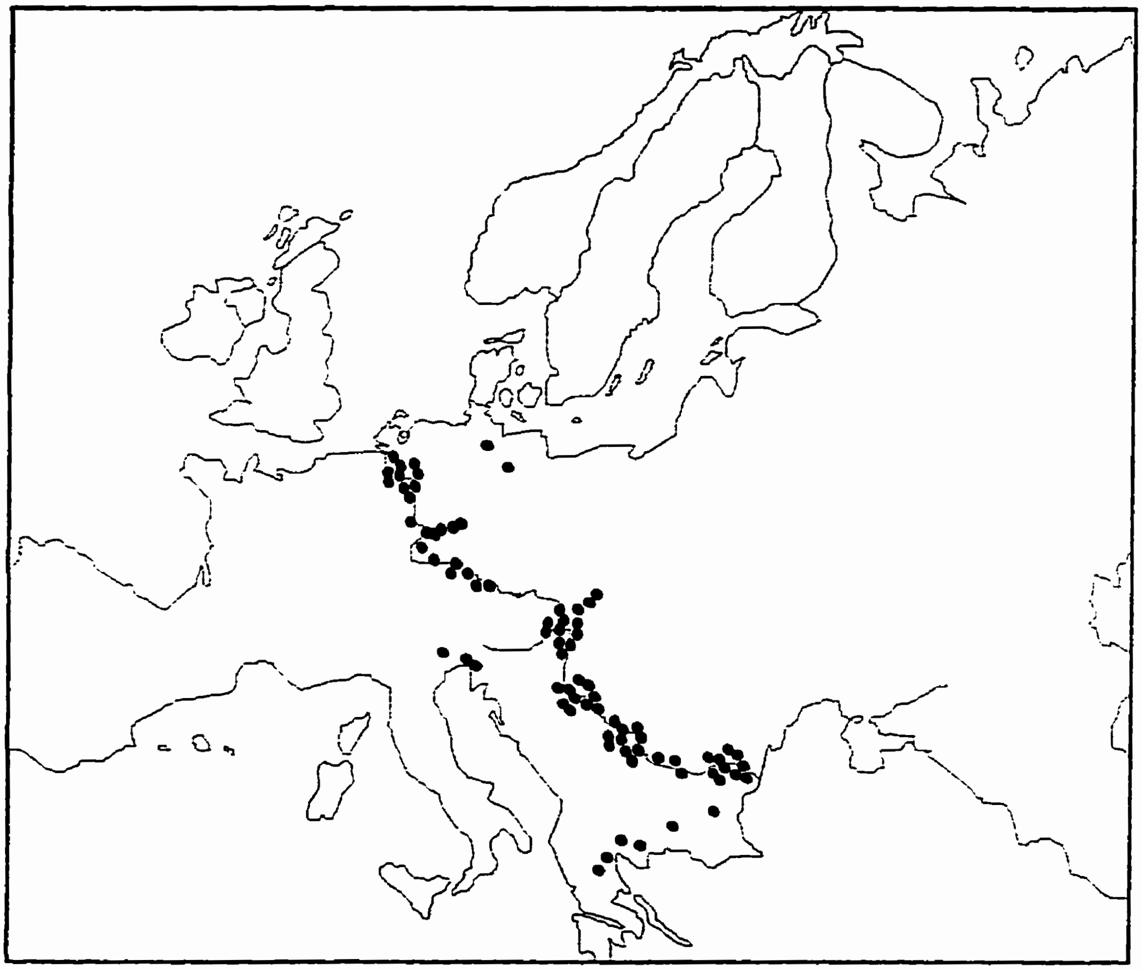


Illustration 5.13. Distribution of spondylus shell ornaments throughout central Europe. Source: Renfrew (1977:188).

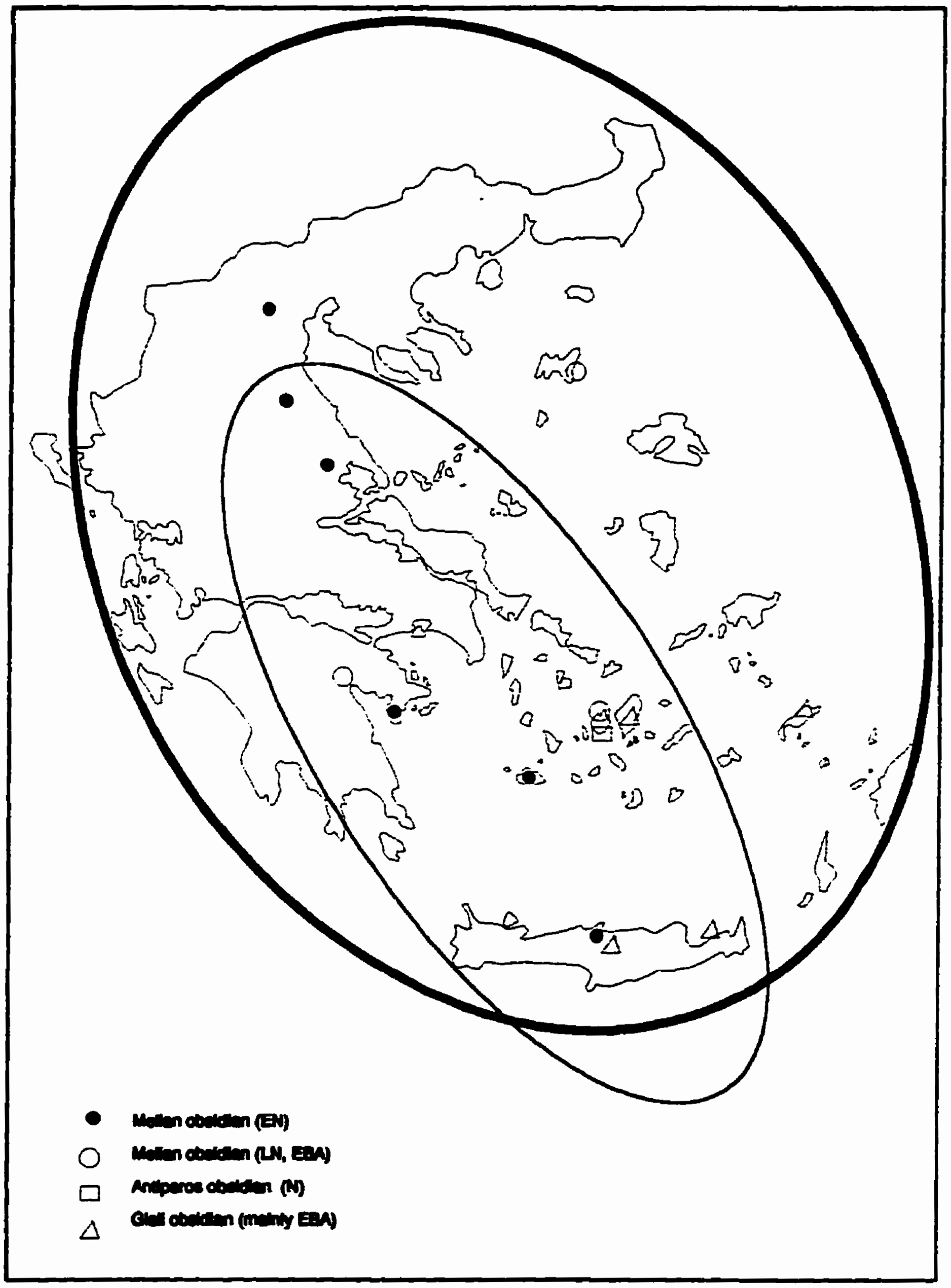


Illustration 5.14. Map of the obsidian trade during the Greek Neolithic and Early Bronze Age. Dark line shows the outer extent of dense Aegean obsidian occurences. Source: Renfrew (1973:185, Fig. 115).

CHAPTER 6

THE EARLY NEOLITHIC

I. Introduction to the Early Neolithic Material Culture

The Early Neolithic phase, and the following Middle Neolithic phase, are characterized by "classic" Neolithic traits, such as settled agriculture life and an expansion of the types, styles, and functions of ceramics and stone tools. However, in Greece, these phases hold some unique characteristics unlike contemporary Temperate European or Near Eastern cultures. The EN phase is similar in many ways to the following Middle Neolithic, suggesting a continuous development over less than two millennia.

The majority of radiocarbon dates places the Early Neolithic between 6500 and 5800 B.C. Two dates are near 6800 B.C. (Demoule and Perlès 1993:368), but based upon the dense presence of ceramics, these samples are not thought to belong to the "Aceramic Neolithic."

A. Settlement Pattern

The settlement pattern for the EN is best known from Thessaly as a result of extensive survey conducted over twenty years (French 1972; Halstead 1984; Gallis 1989). The two striking features of the EN settlement pattern are the high number and the relative stability of sites. In Thessaly alone about 120 sites are known for this period, and these are separated by a mean distance of less than 5 km (Demoule and Perlès 1993:368). Over 75% of these sites were occupied for the entire MN phase as well.

The density of settlements shows two distinct patterns. In Thessaly the density was high, considering the number sites and their location. Outside of Thessaly, settlement density was low. There were less permanent settlements, with fewer long-lasting or monumental features (Cherry et al. 1988). Several explanations have been given for this pattern. For the South, it has been suggested that sites needed permanent springs, which would supply a constant and reliable source of water (Runnels and van Andel 1987). Jacobsen (1984), on the other hand, has suggested the pattern is due to the seasonal movement of flocks in the southeastern Peloponnese, based upon traditional transhumance trails.

Sites are clustered around the drainage of major rivers, in the foothills, and a few are located in the semi-mountainous areas, up to 500 m above sea level. The availability of water seems to have been the most important factor for the location of settlements, as villages were built on a variety of soil types, but the method of procuring water (through wells, cisterns, or depressions) is still a matter of debate (Demoule and Perlès 1993:368).

As well, there are also discrepancies in the measurements of the sizes of the sites. Halstead (1984:Table 6.1, 6.6) estimated that the average site size was less than 1 hectare, based upon French's data (1972). But Demoule and Perlès (1993:370), using Gallis' (1989) data, suggest a range from 2 to 5.5 ha in size. The population of the sites is estimated to range from 100 to 300 people per settlement (Halstead 1984; Jacobsen 1981), or perhaps slightly higher in some cases (Theocharis 1973).

The majority of settlements are open-air sites. Caves were not widely used at this time. At Nea Nikomedia (Rodden 1965), there was an early wall which was quickly replaced by a ditch. These ditches, also found at Servia, Souphli Magoula, and Achilleion, have not been adequately explained. Jacobsen (1981) suggests that they were used for drainage. Others submit that the ditch has symbolic meaning, delimiting the inner village space (Demoule and Perlès 1993:370). Most agree, though, that the ditches were not used for defense purposes, nor really had any practical significance whatsoever.

B. Settlement Architecture

The plan of most settlements is of an agglomorative type, with closely spaced free-standing houses, without common walls or bounded courtyards (Illus. 6.1). The houses are typical of Neolithic Greece and the Balkans. They are small and rectangular, but each house has its own particular details (Elia 1982).

Two types of building materials were used at Greek sites. Mudbrick (which common to the Near East but mainly limited to Greece in Temperate Europe) and the wattle-and-daub technique (typical of Europe but not the Near East) were both used at EN settlements (e.g. Sesklo). Stone was also sometimes used for foundations where it was readily accessible. However, it is the copious use of mud that may provide us with some clue as to the presence of the "ditches." Since earth was the most common construction material, used quite regularly in the construction or repair of the houses, why would people travel long distances to obtain it? Using the earth from around the settlement would create a ditch, and at the same time would provide defense from predators. The ditch would also control and restrict access into and out of the settlement.

And, therefore, perhaps as Demoule and Perlès have suggested, the ditch delimited the village centre (or the "heart" of the village)from the outlying areas.

The actual appearance of houses is known from a few clay figures. Most seem to have two or three rooms, with double pitched, painted roofs. Several openings, serving as doors or windows, are also known (Illus. 6.2). A rare find at Prodromos attests to the use of wood. At this site, squared beams were connected by wooden pegs to create the house super-structure (Hourzoumiadis 1971). On the inside, houses show a variation on two main features: floor coverings and hearths. Sometimes floors were covered in patches with pebble floors, spotted with pits of unbaked clay. Most often, though, they consist of unadorned packed clay. Hearths were pebble-lined and plastered, raised on platforms, and some look quite oven-like. The oven-like hearths have been found both inside houses and in open spaces. Actual "ovens" are quite rare, as at Nea Nikomedia (Rodden 1962), which may have been used for cooking or as ceramic kilns (Theocharis 1973).

C. Technology and Crafts

1. Domestic Equipment

The domestic equipment used during the Early Neolithic is typical of the period, in that it is cumbersome and quite diverse (Illus. 6.3). Mats are known from sherd impressions at Servia (Carington Smith 1977), and twine-weaved mats were found at Nea Nikomedia (Rodden 1964). The presence of weaving is surmised from the rare spindle whorls. However, some artifacts of unknown function may have a connection to weaving. Small disks that have been pierced could have been used to wind and store wool, while the "sling-bullets" made of baked or unbaked clay, are reminiscent of loom-weights. The "sling bullets" are often found in great bundles (up to thirty) near hearths.

At all sites clay spoons and ladles, stone pestles, pounders, palettes, grinders, and querns were used. Bone tools are numerous and show quite a variety. Awls were often made from the distal end of a sheep (*Ovis aries*) or goat (*Capra hircus*) metapodials. Pins, spatulae, burnishers, and hooks were also crafted out of bone (Moundrea-Agrafioti 1980; 1981). Polished stone tools (axes, celts, chisels) were made out of a variety of raw materials, including serpentine, jadeite, hematite, and igneous rock. The properties of these rocks suggest that the tool was cut and ground into shape, rather than flaked before polishing.

2. Ceramic Production

New ideas of EN ceramic production come from recent work done in the Peloponnese and from archaeometric analyses. EN ceramics are typically small and consist primarily of convex bowls with rounded bases (Illus. 6.4). Recent studies suggest that the base was modeled, then the walls were built with coils or slabs, particularly at Franchthi Cave and Sesklo (Vitelli 1984b; 1993; see Illus. 6.5). The bowls were slipped, rarely painted with iron oxide pigments, and well burnished (Vitelli 1984b, 1993). Temperatures less than 650°C were used for firing, and the pots show direct contact with the fuel (Vitelli 1991; Maniatis and Tite 1981). The pots seem to have been fired individually, and made only when needed. This would account for the irregularities in shape and the small sizes of the pots (it is harder to make a large pot).

Decoration is quite scarce, and is limited to geometric motifs. These motifs are painted in red or brown on a light background. There are no sharp stylistic boundaries during the EN, and this type of decoration, known as "proto-Sesklo," is common in Thessaly (Sesklo, Prodromos, Otzaki), and to a few sites in the south (Elatia, Boeotia, and Franchthi Cave, Argolid) (Demoule and Perlès 1993:381). Impressed wares are also known during the EN in northern Greece. Although rare in the northeast, it dominates types in the northwest.

3. Stone Tool Production

The flaked stone tools of the EN have often been described as simple. However, the simplicity of the tools is based upon complex strategies of procuring raw material and sophisticated production techniques. A wide variety of raw material was used for tools and these were crafted using an equally wide range of techniques (Illus. 6.6). Local raw materials (low quality chert and jasper) were rarely used and tools were made from odd-shaped flakes produced by direct percussion using a hammer (Demoule and Perlès 1993:382). The non-local materials, which make up the majority of assemblages, were obtained from great distances and worked by a variety of techniques (Moundrea-Agrafioti 1981, 1983; Perlès 1990; Perlès and Vaughan 1983). Obsidian was gained from the Cycladic island of Melos (see Illus. 5.14) and was pressure flaked into fine blades and microblades. Finer-grained cherts, although not common, were worked much the same way as the obsidian to produce the same goods. The larger blades were made of honey flints, introduced as blanks, and used for plant processing. The jasper blades were produced by indirect percussion and were used for processing plants.

Stone tool assemblages in the EN, then, consist mainly of unretouched obsidian blades, and little retouched flint and jasper blades with a sickle gloss (Moundrea-Agrafioti 1981, 1983; Perlès 1990; Perlès and Vaughan 1983). The number of drills, borers, and points varies greatly between sites, and the rare trapeze blades are the only tool that could be considered arrowheads (Demoule and Perlès 1993:382).

D. Trade and Exchange

The peculiar aspect of the lithic industry during the EN is that there is no regional variability in non-local raw material use. The relatively small amount of non-local material suggests that direct procurement of exotic materials by the inhabitants is unlikely, as land and sea trips of several hundred kilometers would have been necessary to obtain the raw materials (Perlès 1990). The long-distance exchange of EN lithics contrasts with the near absence of trade in ceramics. This implies the abundant use of local raw materials for making ceramics. The exchange of ornaments and "prestige items," such as stone seals or vases, are again different. These were traded in much the same way as lithics, but in less quantity. Still, at the beginning of the Neolithic we see a pattern of complex trade and exchange relationships between neighboring sites.

II. Analysis of the Early Neolithic Mortuary Remains

In the following analysis, the mortuary remains from the Early Neolithic deposits of three sites will be discussed. The sites are geographically located in Thessaly and the Argolid. Prosymna and Franchthi cave are located in the Argolid. The mortuary remains at Prosymna date entirely to the EN phase. However, the mortuary remains at Franchthi Cave date to the EN-early MN transition phase. These remains are included in this chapter to differentiate them from the later MN mortuary remains (discussed in the following chapter). The third site is Souphli Magoula, located in Thessaly. Unfortunately, at the time of writing, detailed data on the EN burials at Nea Nikomedia had not been published, and access to the data could not be gained. Although this impairs the size of the EN mortuary sample, the high-quality data presented below allows conclusions to be drawn on mortuary differentiation and social distinctions represented at these sites.

A. Franchthi Cave

1. Introduction to the Site

The site of Franchthi Cave is located on a rocky headland on the southern coast of the Argive peninsula. It is a rather large cave, some 150 m long, which offered in the past excellent protection from predators and the elements (Illus. 6.7). The cave has a long period of intermittent use, from the Upper Palaeolithic to the present, and can be considered one of the best excavated sites dating to the Neolithic period. The cave was ost intensively occupied during the Upper Palaeolithic, Mesolithic, and the Neolithic phases (ca. 28,000 to 3,200 BC).

Excavations at the cave were conducted by an Indiana University team, directed by Thomas W. Jacobsen, from 1967 to 1979. The field methodology of this project was of exceptionally high standard. Most of the remains were recovered intact, and excavators took into account cultural and environmental classes of information. Soundings were conducted in two areas of Franchthi: within and immediately in front of the Cave, and at the Paralia on the coastline. In total, nineteen soundings were conducted, revealing a deeply stratified site. Results of the excavations have been published by Jacobsen in several field reports and general articles (1969; 1973a; 1973b; 1976; 1979; 1981; 1984a; 1984b; Jacobsen and Farrand 1987). As well, some twenty specialist publications are either in print, or are soon expected (Shackleton 1969, 1988; Schaffer 1977; Van Andel and Sutton 1987; Wilkinson and Duhon 1990; Perlès 1990; Hansen 1991; Talalay 1993; Vitelli 1993; Diamant, forthcoming; Cullen and Cook, forthcoming).

Of particular import to this thesis are the records and publications of the human skeletal remains. The late J. Lawrence Angel of the Smithsonian Institution was initially responsible for studying and publishing these remains. A record of these researches are found in the various site reports (Angel 1969, Appendix II; 1973). Upon Angel's death in 1986, these responsibilities were taken up by Tracey Cullen and Della Collins Cook. In 1980, Jacobsen and Cullen (1980) presented some preliminary observations on the Neolithic skeletal material. They outlined the state and quantity of the remains at Franchthi for this period, as well as preliminary conclusions. The sample used by Jacobsen and Cullen must now be considered incomplete, since Cook and Cullen reclassified much of the skeletal material that had been misidentified on-site as faunal remains (Cullen 1995; and personal communication)[1]. As a consequence, the MNI has nearly doubled for the Mesolithic and Neolithic, but the newly identified individuals are not articulated. Publication of the Neolithic material will occur in the twelfth installment of the specialist publications from Franchthi (Cullen and Cook, forthcoming). Cook's recent work on the human remains stored at the Nauplion museum has yielded 12 more "possible burials," five on the Paralia and seven in the Cave (Cullen, personal communication). However, this data has not been included in the analysis below.

The skeletal remains from the cave date to three different phases of the Neolithic. The first Neolithic deposits with skeletal remains have been dated to the Early Neolithic-early Middle Neolithic transition. This sample will be described and analyzed below. Other remains date to the Middle Neolithic and Final Neolithic phases. The mortuary samples dating to these occupation phases will be discussed and analyzed in the chapters that follow.

2. Formal Treatment

a) The Burial Facility

The EN-MN transition mortuary sample at Franchthi is composed of six individual burials. Four interments were found around the Paralia area, and two others within the cave. None of the grave dimensions were recorded by the excavators. The sediments in the cave are rocky and the burial pits were assumed rather than actually being observed (Cullen, personal communication). Therefore, neither the grave type, shape, nor dimensions are given in the burial descriptions below (Table 6.1). Nevertheless, all the graves are thought to be pits, as there was no evidence of stone-lined graves, or any other type of more elaborate mortuary burial facilities (Cullen, personal communication).

b) Preparation and Treatment

All interments are single inhumation burials (Table 6.1). Several burials were made more elaborate by covering the body with rocks or stone slabs. Three of the four graves from the Paralia show this practice. There is little variation in the posture and orientation of the skeletal remains. Most individuals were interred on their left side in a semi-flexed position, facing a northerly direction. One individual in the cave was interred on their back, and another on the Paralia was buried on their left side.

Fr #	Location	Facility	Enhancements	InterForm	Posture	Orientation	PBA	Scenario	Age-Sex	Grave Goods
11	Cave	Pit?	none	Inhumation	left side	N-S	semi-flexed	single	juvenile female	stone "pillow"
12	Cave	indeterminate	indeterminate	Inhumation	back	N-S	semi-flexed	single	juvenile male	none
103	Paralia	Pit?	cap stones	Inhumation	left side	NW-SE	semi-flexed	single	neonate	none
104	Paralia	Pit	none	Inhumation	right side	S-N	disarticulated	single	neonate	none
105	Paralia	Pit?	cap stone	Inhumation	left side	SW-NE	semi-flexed	single	infant	none
106	Paralia	Pit	cap stone	Inhumation	left side	NE-SW	semi-flexed	single	infant	none

Table 6.1. *Description of the EN-MN burials at Franchthi Cave.*

Two hypotheses about the program of disposal at Franchthi have been put forward. First, Jacobsen and Cullen (1981) have argued that the burials at Franchthi are secondary burials. Jacobsen and Cullen believed that the disturbed state of the remains, and the presence of secondary burial at other sites, such as Alepotrypa, strongly suggested a two-stage, or secondary, burial scenario. On the other hand, Cook prefers to see the burials at Franchthi as examples of disturbed primary burials because many of the skeletal elements are present (Cullen, personal communication). Three further arguments can be made for a one-stage process of burial at Franchthi. The first is the location of the disturbed burials. Most of the severely disturbed burials and the bone scatter are located in the Cave. There are several agencies that may have contributed to the disorder of the graves. One possibility lies in Jacobsen's (1984) and Paynes' (1975) argument that the cave was used as a pen for sheep and goat. If this were the case, even a small flock could cause severe degradation to the floor of the Cave over a short period of time. Second, no evidence has been recovered in the area that would suggest a two-stage interment process, such as post-holes for scaffolding, where the body would be laid until it decomposed. Third, the comparison of the EN-MN burial at Franchthi to other cases of secondary burial, at Alepotrypa for example, is difficult to make since these burials occurred during later phases of the Neolithic. Therefore, at the present time, the EN-MN burials at Franchthi will be considered as primary and not secondary burials.

3. Age and Sex Distribution

The EN-MN sample at Franchthi is curiously characterized by the absence of sub-adults and adults (Table 6.2). The sample is composed of equal numbers of juveniles, infants, and neonates. It is possible that the juveniles are of male and female sex, but Cook has suggested that the sexing of younger individuals at Franchthi would be ill advised (Cullen, personal communication; cf. Jackes 1994). It appears that during the EN-MN transition only non-adults were buried in and around the Cave.

	Neonate	Infant	Juvenile	Sub-adult	Adult	Total	% of Total
Male	0	0	1	0	0	1	16.67%
Female	0	0	1	0	0	1	16.67%
Unidentified	2	2	0	0	0	4	66.67%
Total Count	2	2	2	0	0	6	
% of Total	33.33%	33.33%	33.33%	0.00%	0.00%		100.00%

Table 6.2. The age and sex distribution of the skeletal remains at Franchthi Cave.

4. Artifact Occurrence

The occurrence of grave goods with these burials is non-normative. Only one item may be considered a grave good. The artifact is a stone "pillow" on which the head of the female juvenile rested. A similar practice has been observed at other sites, such as at EN Nea Nikomedia in Macedonia and FN Kephala. The connections with this practice at other sites far away in time and space is tenuous at best (cf. Binford 1971), but the item may have acted as a local sociotechnic symbol, signifying a non-rank based social status (Peebles 1971).

5. Spatial Distribution

During the EN-MN transition at Franchthi Cave, the only obvious distinction between the burials is in their spatial location ($p=0.067$; Table 6.3). Infants and neonates were buried outside the Cave, while juveniles were interred inside the Cave. This distinction may have some connection with initial rites of passage in the society, which recognized only juveniles as members of the community (cf. Jacobsen and Cullen 1981). The formal practice of exclusion implies that the infants, and certainly the neonates, did not live long enough to be formally acknowledged as members of the society. To symbolize this exclusionary status, the young were not buried with the recognized members of the society, although they were accorded the much same formal mortuary treatment.

		Location[a]		
Age-Sex	Data	Cave	Paralia	Grand Total
juvenile female	Frequency	1	0	1
	% Total	16.67%	0.00%	16.67%
juvenile male	Frequency	1	0	1
	% Total	16.67%	0.00%	16.67%
infant	Frequency	0	2	2
	% Total	0.00%	33.33%	33.33%
neonate	Frequency	0	2	2
	% Total	0.00%	33.33%	33.33%
Total Frequency		2	4	6
Total % Total		33.33%	66.67%	100.00%

[a] Fisher exact = 0.067

Table 6.3. The age and sex distribution by location at Franchthi Cave.

6. Mortuary Differentiation and Social Distinctions

a) Normative Mortuary Treatment

The available evidence at Franchthi Cave suggests that the normative mortuary treatment was single inhumation burials in pits (Table 6.4). The remains of the dead were most often placed in the grave on their right side, in a semi-flexed position. The burial scenario, as suggested above, can be best described as a one-stage, or primary, burial process. There is no secondary evidence to suggest a two-stage burial process. The burials are formally divided into two disposal areas: one on the Paralia, and one in the Cave. The basis for this distinction is age. Grave goods are rare in these burials, and only one juvenile received a "gift." The head of this juvenile was placed on a stone "pillow." This practice may only have symbolic significance within the local area.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Floor	earth or bedrock floor
	Exterior	cap stones
	Formal Disposal Type	disposal area
	Special Features	two disposal areas
Preparation and Treatment	Age-Sex Categories	juveniles/infants/neonates only
	Interment Type	inhumation
	Posture	left side
	Orientation	random
	PBA	semi-flexed
	Cultural Modification	none
Burial Scenario	Interment Form	single burial
	Ritual Process	primary burial
Burial Goods	Raw Material	gifts = alternative juvenile treatment
	Source	local
	Distance	<100 km
	Manufacture	none
	Function	sociotechnic

***Table 6.4.** The normative treatment of the dead at Franchthi Cave.*

b) Social Distinctions

The small sample size and skewed age and sex distribution of the EN-MN sample preclude any confident inferences regarding social distinctions. However, the present evidence suggests that social distinctions were based primarily upon age.

The burial of juveniles in the Cave, and infants/neonate outside the cave, suggests spatial segregation based upon age. The location of the juveniles' graves can otherwise be interpreted as symbolizing membership in the community. The infants and neonates appear to be excluded from this social membership. The stone pillow given to the (possibly) female juvenile suggests more effort went into the preparation and treatment of this individual. In contrast, the other young juvenile did not receive any grave goods. One can infer that the item given the female juvenile has sociotechnic significance within the community. It is possible that this juvenile had reached puberty at the time of death, and was therefore treated differently than the other juvenile.

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation	Comments
Horizontal Distinctions						
Age Status	2	Juvenile	male?/female?	location of graves		in cave
	4	Infant/ Neonate	??	location of graves		on Paralia
Special Status Distinctions						
Alternative Treatment	1	Juvenile	Female?		sociotechnic item: stone "pillow"	

Table 6.5. The dimensions of social distinctions represented at Franchthi Cave.

B. Prosymna

1. Introduction to the Site

The site of Prosymna was a location favored for periodic habitation from the Neolithic to Classical times. During three field seasons (1925, 1927, and 1928), Carl Blegen laid out numerous exploratory trenches in the hopes of uncovering unknown areas of the Bronze Age settlements, and the associated tombs (Blegen 1937). During these excavations, Blegen discovered five Neolithic deposits (Illus. 6.8). One deposit is located just north of the acropolis at Prosymna, three are located west of this on the East Yerogálaro ridge, and another was discovered high on the West Yerogálaro ridge.

The five deposits found by Blegen suggest Early Neolithic habitation of the area (Demoule and Perlès 1993:385). On the West Yerogálaro ridge, a rectangular depression (2.6 by 2.8 by 0.55 m) running from east to west was unearthed (Blegen 1937:28; see

Illus. 6.8, A). The depression was intentionally made, and was filled with small stones, several wares of broken EN pottery, 80 flakes and fragments of obsidian, and domesticated faunal bone remains (Blegen 1937:28-29). The pit also held pieces of charcoal, and the floor and walls were marked by burning. This led Blegen (1937:28) to suggest that the area was used as a hearth.

In the central area of the East Yerogálaro ridge, three further Neolithic deposits were found (Illus. 6.8, B). One of these was a small ceramic deposit, holding sherds of Early Neolithic date (Belgen 1937:23-24). More visible traces of Neolithic occupation were found on the east side of Chamber Tomb X. Here, a large circular depression (4m in diameter and 0.8m deep) held animal bones, numerous pottery sherds, and charcoal. The pottery recovered was black, red, and brown monochrome ware, characteristic of the Early Neolithic wares in southern Greece. Also found was the "rainbow" ware that dates to the Early Neolithic. The thick deposit of carbonized material and ashes prompted Blegen to propose that this area also acted as a large open hearth (1937:25). Four smaller impressions (from 0.8m to 1.25m) were found in the immediate vicinity of this large hearth. These are thought to be smaller fire pits (Belgen 1937:25). The large hearth occupied a central location in this group of fire pits.

The fifth Neolithic deposit was found very near the group of hearths. In the upper strata of this deposit, excavation revealed the entrance to a small cave, and three disturbed skeletons (Illus. 6.9). Further into the cave, two strata of relatively thick layers of ash (0.3m and 0.2m) were found. Within and below the ash layer, pottery dating to the Early Neolithic phase was recovered. Further into the small cave, lay six graves.

The habitation remains and the mortuary remains suggest a small population size. It is probable that the people who used the habitation site, and buried their dead in the cave, acted as a corporate group. Judging from the faunal remains deposited in the fire pits, and the general lack of permanent structures in the occupation area, this group was most likely nomadic, or semi-nomadic. These observations concur with the arguments made by Jacobsen (1984) regarding the nature of settlement pattern in the southeastern Peloponnese.

2. Formal Treatment

a) The Mortuary Facility

Six pit graves were found in the small cave at Prosymna (Table 6.6, Illus. 6.10). The cave is about four meters in diameter. A one meter high rock outcrop composes most of the cave ceiling. The six graves appear to be large to hold only single interments. Only three graves contained the skeletal remains of single individuals. Grave IV is located in the southeast corner of the cave, and contained the undisturbed remains of a juvenile. Graves V and VI are located in a natural niche, under a rock overhang in the northwest corner of the cave. Grave V contained the remains of an adult, and Grave VI held only a femur of another adult. Graves I, II, and III did not contain any skeletal remains. The absence of these remains will be discussed below.

Blegen Fr #	I	II	III	IV	V	VI
Type	pit	pit	pit	pit	pit	pit
Shape	circular	circular	circular	circular	oval	oval
Length	0.85	0.97	1.15	0.65	1.5	1
Width	0.85	0.82	1	0.55	0.85	0.65
Depth	0.45	0.25	0.4	0.4	0.45	0.55
Volume	0.26	0.18	0.42	0.13	1.95	1.18
Enhancements	pebbles	pebbles	covering stones?	covering stones	covering stones	covering stones
Floor Color	grey	grey	grey	grey	grey	grey
Area Form	cave	cave	cave	cave	cave	cave
Interment Form	inhumation	inhumation	inhumation	cremation	cremation	inhumation
Macrolocation	East Ridge	East Ridge	East Ridge	East Ridge	East Ridge	East Ridge
Mesolocation	northeast	central	southeast	southeast	northwest	northwest
Main Bone Elements	cranial/post-cranial frags	cranial/post-cranial frags	cranial/post-cranial frags	cranium/long bones	cranium/long bones	femur
Posture	disturbed	disturbed	disturbed	disturbed	disturbed	disturbed
Age	undifferentiated	undifferentiated	undifferentiated	juvenile	adult	adult?
Burial Gifts						
Stone		beads			beads/obsidian	
Quantity		4			2	
Pottery					red monochrome	
Quantity					2	

Table 6.6. Descriptions of the Early Neolithic burials at Prosymna.

The mortuary facilities in the small cave cemetery at Prosymna are circular, or slightly oval, pits. All the graves contained stones and grey earth that were once packed over the bodies (Blegen 1937:27-28). The six graves vary significantly in size (Table 6.7). The graves have an average radius of 0.635 m and a volume of 0.686 m^3. The smallest and largest graves differ slightly from 0.36 m in radius to 0.58 m^3 in volume. There is some disparity, then, between the sizes of the graves. From the calculated grave volumes, it is estimated that it took less than two hours to dig the smaller graves, and around six hours to excavate the two larger graves[2].

Fr #	Length	Width	r	r2	Π	Depth	Volume	Time Est.
1	0.85	0.85	0.425	0.181	3.142	0.45	0.26	<2 hrs.
2	0.97	0.82	0.485	0.235	3.142	0.25	0.18	<2 hrs.
3	1.15	1	0.575	0.331	3.142	0.4	0.42	<4 hrs.
4	0.65	0.55	0.325	0.106	3.142	0.4	0.13	<2 hrs.
5	1.5	0.85	1.175	1.381	3.142	0.45	1.95	>6 hrs.
6	1	0.65	0.825	0.681	3.142	0.55	1.18	●6 hrs.
Avg.	1.020	0.787	0.635	0.486		0.417	0.686	
Avg. Dev.	0.203	0.124	0.243	0.363		0.067	0.585	

Table 6.7. *Dimensions of the burial facilities at Prosymna.*

b) Preparation and Treatment

The burials at Prosymna present an unusual admixture of preparation and treatment techniques. Three skeletons were found in the entrance of the cave in a disarticulated state. These skeletal remains were fragmentary, and were not well preserved. Three other skeletons were located in the cave itself. The individuals in Graves IV and V were cremated. The individual represented by the single bone in Grave VI does not appear to have been cremated.

The cremated remains were highly carbonized and blackish in appearance. This suggests that the bones had been subjected to intense heat for a long duration of time. Blegen reported no pathologies or cut marks on the cremated bone, which suggests that the bodies were burned articulated and fleshed. Considering Buikstra and Swegle's experimental data (1989), it would have taken more than 60 or 70 minutes of intense heat to achieve this state of burning.

Blegen suggested that the fire pits excavated near the cave and on the West Yerogálaro ridge would have acted as cremation pyres (Blegen 1937:25, 29). However, the deep ash layer just inside the cave suggests another possibility. In all other cases of cremation during the Greek Neolithic, human bones are found in the cremation pits. No human bone remains were observed in either of the hearth areas at Prosymna. Further, the deposit on the Yerogálaro ridge is located over 300 m from the place of burial. To transport the cremated remains would have required a container of some sort. It would follow, as is represented in other cases of cremation during this phase (e.g., Souphli Magoula), that the cremated remains of the individual would have been given final interment still in the container. It is improbable that the hearth located on the West Yerogálaro ridge would have acted as a funerary pyre. It is more likely that the cremation would have taken place at the entrance to the cave, rather than on the ridge or in the cooking fires of the habitation area. If cremation took place in the cave entrance all the bones could be easily recovered and transported to the pit for burial.

Further insight into the mortuary ritual in the cave is suggested by another layer of ash that was found over each grave. Blegen describes this as a thick ash layer, full of charred earth and other matter (1937:28). I do not agree with Blegen's interpretation that this represents a shrine where sacrifices were offered to the dead. The fact that the layer was thick, does not immediately signify it came as a result of repeated use. I would otherwise suggest that this indicates the concluding act in the mortuary ritual, symbolizing the final rite of passage of the dead. The presence of numerous sherds of EN pottery strewn about the entrance of the cave supports an in-cave ritual.

Blegen could also not explain the presence of the three uncremated individuals located at the entrance to the cave (1937:27). Several pieces of evidence suggest a reason for the dislocation of these individuals. First, the entrance of the cave was found almost immediately upon excavation, and was located only 0.3 m below the surface. There was no evidence that the entrance had been covered in any fashion, by a wall, stones, etc. Given these circumstances, I would agree with Blegen that access to the cave was open when these burials occurred (1937:26). Second, the graves that do not contain skeletal material are shallow on one side. These portions of the pits range from 0.2 m to 0.4 m at the shallowest depth. The mixing of stones that covered these graves, and the burnt ash layer above this, suggest severe post-depositional disarrangement of the grave contents. It is reasonable to assume, then, that the disturbed remains at the entrance of the cave could have once occupied the three empty graves. Given the accessibility to the cave and the shallowness of the graves, the dislocation of the human remains could be a result of carnivore or other digging activity. Further, the cave had collapsed in antiquity, after the graves had been constructed (Blegen 1937:26). The falling debris would have covered Graves I-III, leading to the conclusion that their disorder occurred prior to the collapse.

This interpretation may also help explain the presence of both inhumation and cremation in the cave. Only the cremated remains in Grave V were slightly disturbed. I would suggest that the cremated remains in Grave III were not disturbed at all, since there is little food value to cremated remains. It is also possible that the cremated burials antedate the inhumations. Cremation may have been invoked as an innovation to prevent the intrusion of carnivores. Although cremation takes more effort in the process of mortuary ritual, this may have been seen as a small investment to safe-guard against the decimation of the disposal area by predators.

3. Age and Sex Distribution

The age distribution shows little compatibility with a normative distribution (Table 6.8). However, only 50% of the remains in the cave were aged, and none were sexed. None of the disturbed skeletal remains in the cave entrance could be identified to an age or sex category. From the remains that were aged, adults dominate over juveniles at a ratio of 2:1. The small number of individuals in this cemetery indicates that it was used for only a short time.

	Indeterminate	Infant	Juvenile	Subadult	Adult	Total
Total	3	0	1	0	2	6
% of Aged		0.00%	33.33%	0.00%	66.67%	
% of Total	50.00%	0.00%	16.67%	0.00%	33.33%	100.00%

Table 6.8. The age distribution of the skeletal remains at Prosymna.

4. Artifact Occurrence

Only two individuals appear to have received burial gifts. Four spherical stone beads were found near the southwest of Grave II, and these may have once formed a necklace belonging to the person in Grave II. Following the scenario outlined above, it is probable that the beads would have been scattered upon the removal of the body. Further, several other clay beads were found on the floor the cave (Blegen 1937:27). These may have once belonged to the other individuals in Graves I and III. In Grave V, a stone bead, an obsidian blade, and two red monochrome sherds were found. In general, the distribution of grave goods shows a disparity in the type, frequency, and allocation of goods to certain individuals.

5. Symbolic Designations

Symbolic designations in this cemetery were identified through an examination of the artifact distribution and the amount of energy expended in the mortuary treatment. As noted above, the distribution of artifacts is limited to only two of the six graves. However, the clay beads scattered about the cave floor hint of the possibility that the persons in Graves I and III may have also received gifts. However, the greatest frequency and variety of gifts was given to the adult in Grave V. This implies that this individual received greater corporate involvement in the material contribution to ritual, and held some measure of prestige in the small community.

	Energy Expenditure Levels			
GRAVE #	1	2	3	Grand Total
1	0	1	0	1
2	0	1	0	1
3	0	1	0	1
4	0	0	1	1
5	1	0	0	1
6	0	0	1	1
Grand Total	1	3	2	6

Table 6.9. The distribution of the energy expended in mortuary treatments at Prosymna.

An investigation of the energy expended in mortuary treatment was made possible by the good state of preservation of the skeletons, graves, and associated artifacts (Table 6.9). A moderate amount of energy was expended in most interments. Low amounts of energy were expended in interring the juvenile in Grave IV and the individual in Grave VI. The person in Grave V had the greatest amount of energy expenditure. Overall, this individual received the greatest corporate involvement in preparing and treating the body and the grave, and the material contribution to ritual.

6. Mortuary Differentiation and Social Distinctions

a) Normative Treatment

The burials at Prosymna present a dichotomy in mortuary treatment (Table 6.10). There is no normative treatment of the dead, *per se*. Both inhumation and cremation techniques of preparing the body were used. The skeletal remains were placed in circular or oval graves that had been dug out of the earth that covered the cave floor. Pebbles, earth and stones were deposited over the bodies once they were placed in the grave. Once this was complete, a fire was lit over the top of the grave. It is difficult to establish what this ritual may have entailed, but given the amount of pottery and burnt organic material about the cave, a funerary meal is one possibility. In general, the burial scenario, or program of disposal, at Prosymna consists of single interments prepared using a one-stage primary inhumation burial process, or a two-stage cremation burial process.

The burial goods found in the cave are sparse, but nevertheless, are indicative of differential treatment. Only one artifact, the obsidian blade in Grave V, can be considered as a "trade" item. Direct procurement was not the norm during the Early Neolithic, and the good was probably traded for through down-the-line exchange (cf. above). For these reasons, this gift would have functioned as a sociotechnic marker, but presumably only local in range. The beads found in Grave II and about the cave floor indicate personal adornment. The beads also appear to have had a local sociotechnic function. However, there are two types of beads, clay and stone. This may indicate either personal preference, or may be indicative of some status distinction.

In general, mortuary differentiation at Prosymna is manifest by:

1. differential techniques used to prepare the body and the grave;
2. a disproportionate distribution of grave goods to specific individuals, and the exclusive allocation of specific types to specific individuals;
3. the differential location of graves (Grave V and VI appear more sheltered); and
4. the three levels of energy expended in the overall mortuary treatment.

Features	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Shape	circular/oval
	Avg. Volume (m^3)	0.69
	Floor	earth or bedrock floor
	Formal Disposal Type	cave
	Special Features	stone and pebble coverings/ritual meal?
Preparation and Treatment	Age-Sex Categories	skewed
	Interment Type	inhumation & cremation
	Posture	disturbed/disarticulated
	Orientation	disturbed/disarticulated
	PBA	disturbed/disarticulated
	Cultural Modification	cremation
Burial Scenario	Interment Form	single burial
	Ritual Process	primary & secondary
Burial Goods	Raw Material	stone
	Avg. #/interment	4*
	Source	local
	Distance	local
	Manufacture	local
	Function	sociotechnic-local

*This only includes the goods located in Graves II and V.

Table 6.10. The normative mortuary treatment represented by the burials at Prosymna.

b) Social Distinctions

The small sample size at Prosymna does not allow many status distinctions to be confidently inferred. However, the variation in mortuary treatment does suggest four possible social distinctions may have been expressed through mortuary activity (Table 11.).

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation
Vertical					
Elevated Social Positions					
Special Prestige Position	1	Adult	?	high energy expenditure; location of burial	valued goods; trade item
Horizontal					
Corporate Group	1	All ages	Male/Female	Location of graves	
Age or sex status	4	?			bead necklaces
Age status	1	Infant	Indeterminate	cremation	no grave goods

Table 6.11. The dimensions of social distinctions represented at Prosymna.

First, the goods, grave location, grave size, and energy expended in interring the individual in Grave V, implies that this person held a particular position of prestige in the society. It is unlikely that this was a large community. This person may have only acted as an authoritative leader or elder. Second, as I suggested above, the size and features of the settlement suggest it was used by a single, small corporate group. The exclusive burial of the dead in the cave also reflects corporate group membership. Third, I suggested above that the beads symbolize a status distinction. At Prosymna, this is probably represents nothing so distinctive as rank or wealth, but may reflect an age or sex status. However, without the benefit of precise osteological identification of the skeletal remains, this proposal cannot be confidently supported. Fourth, there is stronger evidence for an age distinction that marked non-adults from adults. The infant is the only burial in the cave that did not expressly receive any burial goods.

C. Souphli Magoula

1. Introduction to the Site

The prehistoric site of Souphli Magoula is located about 5 km northeast of Larisa, on the eastern bank of the Peneios river (Gallis 1979:66; see Illus. 6.11). This site was first examined in 1958 by Demetrios Theocharis (1958:78; 1960:171). Later in the same year, Hagan Biesantz (1958:78; 1959:70) discovered urns containing cremated remains. Unfortunately, these urns and their contents were badly eroded. The state of preservation of the remains was quite affected by erosion and the excavation of an irrigation ditch prior to the salvage work. The excavation by Gallis (1989) was a salvage operation undertaken for these reasons (similar to the Plateia Magoula Zarkou excavations, cf. Chapter 8). The remains examined in the analysis below date to the later part of the Early Neolithic.[3]

This site is generally regarded as having the earliest reported cases of urn burial and cremation in Greece (Renfrew 1972:79; Gallis 1988). The 1972 sounding revealed a further 18 Early Neolithic burials. Five of the cremation burials were nearly intact, and the remainder were either disturbed or destroyed to a greater or lesser extent. Two of the burials uncovered in 1972 were inhumation burials. These two burials were found in the same EN deposits as the cremation burials.[4] What makes this site interesting is the wide range of specialized features and practices that relate to mortuary activity at Souphli.

2. Formal Treatment

a) Mortuary Facility

The mortuary facilities used at Souphli were small pits, which housed the urns containing the cremated remains. There is not a great deal of variation in pit size, shape, or volume. The pits were all roughly circular in shape, but Grave 10 is more ellipsoidal than circular. Most of the pits have roughly the same dimensions in length, width, and depth (Table 6.12). The volume of most graves is also similar, and they average 0.056 m^3. It is estimated that it would have taken less than two hours to excavate the pits. The only variation in this pattern is Grave 14. Compared to the others this is quite a large grave (0.603 m^3). It is estimated that it would have taken over six hours to dig and prepare this grave. The shapes of the pits for the inhumations could not, unfortunately, be determined by Gallis' team.

Several other features were observed in the disposal area that are some interest to this study. To the west of the ditch, Gallis opened two trenches, revealing several features related to the process of cremation. In the larger of the two trenches (Illus. 6.10), the excavations revealed what are considered to be two "crematoriums" (Gk. 'Αποτεφρωτηριο; Illus. 6.12, ε and β). Both crematoriums were found during the 1976 excavations. Crematorium A (Illus. 6.12, Feature β) is located in the area of Locus 15. The circular pit is 1.1 m in diameter and 0.3 m in depth. In this pit, a large amount of charcoal, carbon fragments, and small fragmented human bones were found. On the edges of the pit, three post holes were noticed, which may have been used to support a funeral pyre (Illus. 6.14; Gallis 1989:224). The walls of the pit had been repeatedly baked by intense heat. A second crematorium (Crematorium B) was unearthed to the east of this (Illus. 6.12, Feature ε). This circular pit was larger and more elaborately constructed than Crematorium A. Crematorium A is 1.2-1.3 m in diameter and had walls made of rough brick that had been repeatedly burnt. The crematorium contained incinerated human bone fragments in its interior, and only slightly burnt bones on the edges of the pit (Gallis 1989:226).

Also in Locus 15, a combination of several other intermingled features were found (Illus. 6.12, Feature δ, Feature ζ). Running in a southwest to northeast direction was a large trench or channel. The precise size of the channel was not determined, but it would have run farther to southwest and northeast. Two cremation burials were found immediately above the channel (Graves 13 and 14). Under the cremation burials were two fill levels composed of gravel, charcoal, carbon fragments, and burnt human bone. Also, in the general area of Locus 15, numerous small and fragmentary burnt human bones were found.

Fr #	Sk #	"Group"	Location	FacType	Shape	Intform	Length	Width	Depth
1		1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
2	1	1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
3		1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
4	2	1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
5	3	1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
6	4	1	A-A	pit	circular	jar cremation	0.6	0.6	0.2
7 upper	5a	1		pit	n/a	jar cremation			
7 lower	5b	1		pit	n/a	jar cremation			
8	6	1		pit	n/a	jar cremation			
9		2	DESTROYED	n/a	n/a	jar cremation			
10a (upper)	7a	2γ		pit	ellipsoid	jar cremation	1.5	0.6	0.3
10b (lower)	8a	2γ		pit	ellipsoid	jar cremation	1.5	0.6	0.3
11	9	2		pit	n/a	jar cremation			
12	10	2		pit	n/a	jar cremation			
13	12	2		pit	irregular	jar cremation	0.7	0.7	
14	13	2		pit	irregular	jar cremation	1.7	1.5	0.3
Int-1		2ζ	N-below occ.level	pit	irregular circular	inhumation			
Int-2		2ε	N-below occ.level	pit	irregular circular	inhumation			
Cr A	11	2β		"crematorium"	circular	none	1.1	1.1	0.3
13/14-1	14	2	Level 1-fill	scatter area	irregular	bone scatter			
13/14-2	15	2	Level 2-fill	scatter area	irregular	bone scatter			
Cr B1	16	2δ	Level 1-fill	"crematorium"	circular	none	1.3	1.2	
Cr B2	17	2δ	Level 2-fill	"crematorium"	circular	none	1.3	1.2	
Cr B3	18	2δ	Level 3-fill	"crematorium"	circular	none	1.3	1.2	
Cr B4	19	2δ	Level 4-fill	"crematorium"	circular	none	1.3	1.2	
Cr B5	20	2δ	Level 5-fill	"crematorium"	circular	none	1.3	1.2	
Locus 15	21	2ν	Locus 15	unknown	channel	none			

Table 6.12. *Description of the burial facilities at Souphli Magoula.*

b) Preparation and Treatment of the Body

From the wide range of cranial and post-cranial human bone elements found in the Souphli disposal area, 18 individuals were identified. A further eight individuals were also determined by a re-study of the published skeletal data recovered from the crematoriums and the fill deposits about the area. It is unknown if the newly identified individuals correspond to the formally buried and cremated individuals. As a result, they are not considered in this analysis.

Burning	Frequency	% Total
carbonized	13	46.43%
carbonized-calcined-smoked	4	14.29%
carbonized-calcined	3	10.71%
calcined	2	7.14%
carbonized-smoked (defleshed)	2	7.14%
calcined (defleshed)	1	3.57%
carbonized-calcined-smoked (defleshed)	1	3.57%
carbonized-smoked	1	3.57%
smoked	1	3.57%
Grand Total	28	100.00%

Table 6.13. Frequency of burning types at Souphli Magoula.

All the recovered human bone remains were burnt to various degrees. The bones were either carbonized (black), calcined (white), smoked (grey), or combinations of the three (Table 6.13). The majority of individuals had completely carbonized bones (46.43%). There are low frequencies of individuals with carbonized, calcined and smoked (14.29%), or carbonized and calcined (10.71%) bones. Several cremation burials also had bones that were brown in color. This color indicates the bone was burnt "dry," or with the flesh removed before burning (Buikstra and Swegle 1989). The brown coloring was also observed on bones that had been subjected to different intensities of burning. Overall, 14.28% (n=4) few individuals had bones with this coloring. This data shows that only a few bodies had the fleshed removed before incineration. It appears that most individuals would have been burned fully fleshed and articulated.

Only certain cranial fragments, vertebrae, and scapula were calcined and not carbonized (Fig. 6.1). This means that contact with fire was more direct and intense for these elements, and they were more thoroughly burnt before being removed for burial. All of these bone elements are located on the dorsal side (or back) of humans.

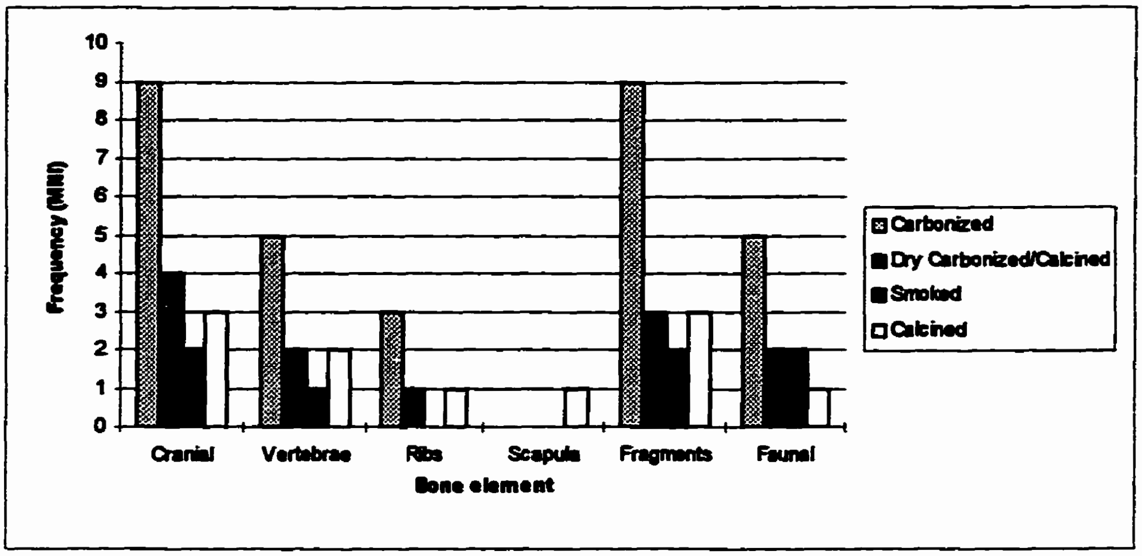


Figure 6.1. Distribution of burnt bones by element at Souphli Magoula.

It is probable that scapula, and other large bone elements, occur in very low frequencies in this sample because they were too large for the burial urn. For example, the only scapula in the sample comes from a juvenile female. If broken, this bone could fit in a larger jar (such as a skyphos; see below). This pattern of selective bone disposal is also supported by a study of the calcined cranial and vertebral elements. Most cranial bones were completely carbonized, but many cranial bones are small, thin, and located in the facial area. The vertebrae, on the other hand, are strongly secured by the musculature that holds them together and that attaches the ribs to them. If an individual was cremated on a pyre, or just simply laid on a fire, on their back, one would expect these bone elements to be completely calcined due to direct contact with the fire. All the vertebrae recovered were calcined and/or smoked, but were fragmentary. If individuals were cremated on their fronts, few cranial, rib, and vertebral elements would be carbonized. This is because these bones would not have come into direct contact with the fire until the musculature was burnt away, when they then would then fall into the fire. It is possible that the lumbar vertebrae would not have been calcined because they are surrounded by more dense muscles and ligaments.

Overall, differential incineration of the bone elements suggests that individuals were cremated on their backs rather than their fronts. The frequencies of carbonized versus calcined bones indicates that few bone elements came into direct contact with fire, or were subjected to long, intense periods of burning. It is more likely, then, that the corpse was cremated while suspended over the fire. The post-holes around Crematorium A also imply such a practice. Calcined bones would have resulted from smaller bone elements (i.e., bone fragments, see Fig. 6.1) falling into the fire once disarticulated.

3. Age and Sex Distribution

A large number of the bone elements that are key referents for identifying age and sex characteristics (cranium, pelvis, etc.) were too burnt, fragmented, or not present in the sample. Therefore, age or sex determinations were not possible for most individuals (72.22%). The age and sex distribution at Souphli is skewed because of these factors (Table 6.14).

The age of cremated individuals is often more easily determined than the sex. However, almost half of the remains could not be identified to an age category (44.44%). Adults (22.22%) dominate the age distribution, followed by juveniles (16.67%), infants (11.11%), and sub-adults (5.56%). Only two adult males were identified. Three females were identified: one of adult age, one of juvenile age, and one of indeterminate age. Even if the unidentified individuals are dropped from consideration, the number of juveniles is still quite high. These numbers almost rival the frequency of adults at the time of death. Infants and juveniles died at a 1:1 ratio to sub-adults and adults (n=5 infants/juveniles:n=5 sub-adults/adults). This mortality rate is lower than expected, as compared with other Neolithic communities (Jackes 1988). This ratio suggests that this population was successful in replacing members of the community lost through death.

Sex	Unidentified	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	0	0	2	2	11.11%
Female	1	0	1	0	1	3	16.67%
Unidentified	7	2	2	1	1	13	72.22%
Total	8	2	3	1	4	18	100.00%
% of Aged		20.00%	30.00%	10.00%	40.00%		55.56%
% of Total	44.44%	11.11%	16.67%	5.56%	22.22%	100.00%	

Table 6.14. The distribution of age and sex in the Souphli cemetery.

4. Artifact Occurrence

Three classes of artifacts occur in the Souphli cemetery: burial urns, burial goods, what might be considered ritual furniture. Objects in the latter class were not found in the contexts of the graves, but in the area of the crematoriums. They will be discussed separately below.

Over half of the burial urns were damaged (53%) due to the post-depositional factors noted above (Table 6.15). Therefore, the precise type and shape of many vessels could often not be determined (Gallis 1989). The graves and artifacts located farther away from the irrigation ditch were better preserved. Those urns located in the ditch were mostly destroyed or severely fragmented. All indications suggest, however, that there was only one type of burial urn at Souphli, although it came in a variety of sizes. The best preserved skyphoi come from the central part of the site. It was not possible to determine which factors (such as age or sex) may have constrained the distribution of burial urns.

Fr #	BG Material	BG Class	BG Type
1	Pottery	urn	unknown
2	Pottery	urn	unknown
3	Pottery	urn	unknown
4	Pottery	urn	unknown
5	Pottery	urn	skyphos
6	Pottery	urn	n/a
7 upper	Pottery	urn	n/a
8	Pottery	urn?	unknown
9	Pottery	urn	n/a
10a (upper)	Pottery	urn	skyphos
10g (lower)	Pottery	urn	skyphos
11	Pottery	urn	skyphos
12	Pottery	urn	skyphos?
13	Pottery	urn	skyphos
14	Pottery	urn	skyphos?

Table 6.15. *The distribution of burial urn types in the Souphli cemetery.*

Several types of burial gifts appear in the Souphli cemetery (Table 6.16). The most frequent gifts are pottery. There is one instance where a stone rubber was left for an adult male (Grave 10g), and a figurine was given to the inhumation of indeterminate age or sex (Inhumation 1). Otherwise, most burial gifts are of two types: a skyphos (Illus. 6.15, nos. 7-10) or a crudely made mini-vase (Illus. 6.15, nos. 2 and 12). The one unique find is the so-called "fruit-stand" (Illus. 6.15, no. 13), which was found in Grave 14. There is also one example where the grave gift was destroyed to such a point that the type was not determinable (Grave 13). This item was, nevertheless, identified as a pottery vessel.

Fr #	BG Material	BG Class	BG Type	Age-Sex
5	Pottery	gift	mini-vase	Undifferentiated Juvenile
7 lower	Pottery	gift	mini-vase	Female Juvenile
10 α (upper)	Pottery	gift	mini-vase	undifferentiated Female
10 α (upper)	Pottery	gift	skyphos	undifferentiated Female
10 ζ (lower)	Pottery	gift	skyphos	Adult Male
10 ζ (lower)	Stone	gift	rubber	Adult Male
11	Pottery	gift	mini-vase	Adult Female
13	Pottery	gift	unknown	undifferentiated Juvenile
14	Pottery	gift	fruit stand	undifferentiated
Int-1	Terracotta	gift	figurine	undifferentiated Adult

Table 6.16. The distribution of burial gifts in the Souphli cemetery.

Constraint in artifact distribution is limited to the sex of individuals. Only females appear to have received the mini-vase as a burial gift, regardless of their age. For this reason it is probable that the undifferentiated juvenile in Grave 5, was a female. On the other hand, only one adult male received a stone artifact (Grave 10ζ). The age and sex data were not complete enough to warrant a conclusion on age or sex based constraint of the other unique artifact types.

The next class of artifact found in the Souphli cemetery are items that may have been associated with the mortuary ritual (Table 6.17). In the Crematorium A area, one pot that may have been a skyphos was discovered. This item was apparently not intrusive (Gallis 1989) into this area. In the area of Locus 15, several other objects were also found in the contemporary EN deposits. Here, another skyphos, several sherds, bone and stone tools, and a unique ovoid vase were recovered. The hypothesis that several individuals were defleshed before they were cremated gains strength from the discovery of tools near the crematorium. These tools may have functioned in the ritual process of preparing and treating the dead.

Fr #	BG Material	BG Class	BG Type
Cr A	Pottery	ritual furniture	skyphos?
Locus 15	Pottery	ritual furniture	skyphos
Locus 15	Pottery	ritual furniture	sherds
Locus 15	Stone	ritual furniture	bone tools
Locus 15	Bone	ritual furniture	stone tools
Locus 15	Pottery	ritual furniture	ovoid vase

Table 6.17. The distribution of "ritual furniture" at Souphli.

The use of burial furniture at Souphli is not characterized by redundancy (Table 6.18). Few artifacts appear to have had multiple uses in the mortuary ritual. Only one type of item, the skyphos, may have functioned in all three categories (i.e., as urns, goods and ritual furniture). Otherwise, the artifacts were made and used for specific purposes in the mortuary ritual. This specialization in artifact function or production is not characteristic of the EN phase. Most tools were used for multiple tasks. Only in the subsequent MN phase is there any strong evidence for either craft specialization or purposeful production of specific artifact types.

Type	Burial Furniture Class		
	Burial Urn	Burial Good	Ritual Furniture?
skyphos	X	X	X
mini-vase		X	
figurine		X	
fruit stand		X	
bone tools			X
stone rubber		X	
stone tools			X
ovoid vase			X
unknown	X	X	X

Table 6.18. Functional uses of the burial furniture at Souphli.

a) Artifact Associations and Distributions

In assessing the associations and distributional properties of artifacts in the Souphli cemetery, a frequency-distribution analysis was employed (Table 6.23). All purposeful inclusions were included in this analysis. That is, even fragmented or destroyed (but identifiable) items were included in the frequency of goods allocated to each individual. At Souphli, only 44.44% of individuals received burial gifts. Therefore, over half the individuals (55.56%) received no grave goods. This distribution is also characterized by a disproportionate number of items given to those who received goods. Most individuals received only one grave good (n=6; 75%), and only two people received more than one good (n=2 goods; 25%). Although this does not immediately presuppose that wealth was a differentiating factor at Souphli, the unequal distribution of burial goods does suggest preferential treatment was accorded certain individuals.

No. Goods	No. Interments	% Total	% Cumulative
0	10	55.56%	55.56%
1	6	33.33%	88.89%
2	2	11.11%	100.00%
Total	18	100.00%	

Table 6.19. *The distribution of grave goods by interment at Souphli.*

As a result, the frequency-distribution of burial gifts fall into three categories (Fig. 6.2). Differential distribution of grave goods often indicates differential treatment based upon social status. This disparity can be based upon the differential access to goods certain individuals had during life (e.g., Shennan 1975; Randsborg 1973), or can more generally indicate the corporate group's material contribution to ritual based upon status or ranking (Binford 1971; Saxe 1971). Given the present distribution, it is expected that a minimum of three levels or rank of status differentiation should be represented at Souphli.

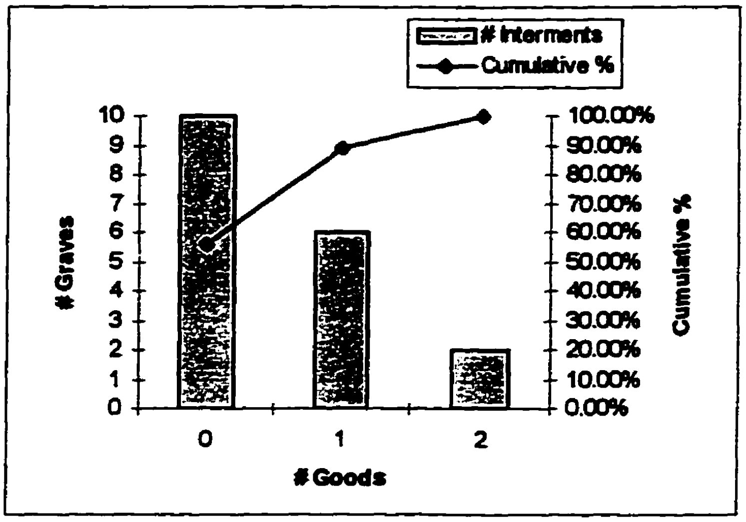


Figure 6.2. The frequency-distribution of grave goods in the Souphli cemetery.

5. Spatial Distribution

In analyzing of the spatial properties of the Souphli cemetery, the disposal area was considered to be made up of two spatially distinct groups (Illus. 6.13). Group 1 are those burials located along the irrigation ditch. Group 2 includes the burials in the trench to the west the irrigation ditch. These two arbitrary groups were tested for similarity in the preparation and treatment of the body and the grave, and the material contribution to ritual. No dissimilarity was noted in the preparation of the mortuary facilities, save the two inhumation burials. However, some disparity was observed in the preparation and treatment of the body, and the distribution of burial goods between the two groups.

Bone Incineration	Group 1			Group 2			Total	
	Frequency	% Total Incineration	% of Total in Group	Frequency	% Total Incineration	% of Total in Group	Frequency	Total % of Incineration
completely carbonized	0	0.00%	0.00%	2	100.00%	28.57%	2	12.50%
partly carbonized and smoked	2	66.67%	22.22%	1	33.33%	14.29%	3	18.75%
partly carbonized and calcined	1	25.00%	11.11%	3	75.00%	42.86%	4	25.00%
completely calcined	1	100.00%	11.11%	0	0.00%	0.00%	1	6.25%
partly carbonized, calcined, and smoked	1	50.00%	11.11%	1	50.00%	14.29%	2	12.50%
indeterminable (highly fragmented)	4	100.00%	44.44%	0	0.00%	0.00%	4	25.00%
Total	9	100.00%	100.00%	7	100.00%	100.00%	16	100.00%

***Table 6.20.** Spatial distribution of the types of degree of bone incineration in the Souphli cemetery. The frequencies refer to the number of individuals in each group.*

There are some differences in the degree of bone incineration and, correspondingly, the time it would have taken to cremate the individuals. As is shown in Table 6.20, there is a disproportionate amount of carbonized-smoked and calcined bone in Group 1. There are also a very large number of individuals whose degree of bone incineration could not be determined. In Group 2, all the completely carbonized and most of the carbonized-calcined bones occur. Overall, 33.33% of the individuals in Group 1 had remains moderately incinerated (carbonized or partly carbonized), whereas 85.72% of the individuals in Group 2 had remains moderately incinerated. It would appear that those individuals buried nearer the crematorium in Group 2 were generally subjected to a greater degree of intense burning than those in Group 1.[5] Therefore, it appears that the greater the intensity of incineration, the nearer the individual was buried to the crematorium. It is possible this pattern is a reflection of the transportability of burnt bone. The greater the degree of incineration, the more fragmentary and fragile the bone becomes. Therefore, smoked or lightly carbonized bone is more easily removed to a location farther from the crematorium than is calcined or more highly carbonized bone.

		Time Estimate (in min.)						Max Time	
"Group"	Data	60-70	7-70[a]	7-12	0	indeterminable	Grand Total	Total Time	Avg. Time
1	Frequency	2	1	5	0	1	9	270	90
	% Total	11.11%	5.56%	27.78%	0.00%	5.56%	50.00%		
2	Frequency	3	3	0	2	1	9	210	110
	% Total	16.67%	16.67%	0.00%	11.11%	5.56%	50.00%		
Total		5	4	5	2	2	18		
% Total		27.78%	22.22%	27.78%	11.11%	11.11%	100.00%		
Difference								15	
Pearson's r	All Burials	-0.618							
	Cremated burials	-0.971							

a The 7-70 minute category includes remains that could not be clearly identified to either the 60-70 or 7-12 minute categories.

Table 6.21. The comparative distribution of time estimated to achieve the degree of incineration observed for the cremations at Souphli. Time estimates based upon Buikstra and Swegle (1989).

There is a corresponding disparity in the time estimated to achieve the degree of incineration (Table 6.21). In Group 1, a small amount of time (7-12 minutes) would have been needed to achieve the degree of incineration of 62.5% of the bodies. The average time it would have taken to cremate all the individuals in Group 1 is estimated to be as low as 90 minutes. In Group 2, 75% of the bones were subject to a maximum of 70 minutes of burning. It is estimated that 110 minutes were needed to cremate these individuals. The difference in average burning time between the two areas is only 15 minutes. This, in broad terms, is quite negligible, and translates into less than 2 minutes per person.

To substantiate these results, the frequencies of individuals in each time category were compared for similarity using the Pearson's r correlation coefficient. Both groups show a high negative relationship (n=-0.971). If the inhumation burials were included, this figure dropped slightly (n=-0.618). This broader analysis suggests that there is a wide discrepancy between the treatment of the body at each location.

	Group		
BG Type	1	2	Total
fruit stand	0	1	1
% of Total	0.00%	4.17%	4.17%
mini-vase	1	3	4
% of Total	4.17%	12.50%	16.67%
n/a	1	2	3
% of Total	4.17%	8.33%	12.50%
rubber	0	1	1
% of Total	0.00%	4.17%	4.17%
skyphos	1	6	7
% of Total	4.17%	25.00%	29.17%
skyphos?	0	2	2
% of Total	0.00%	8.33%	8.33%
unknown	4	2	6
% of Total	16.67%	8.33%	25.00%
Total Frequency	7	17	24
Total % Total	29.17%	70.83%	100.00%

Table 6.22. The spatial distribution of burial gifts in the Souphli cemetery.

There is also some discontinuity in terms of the spatial distribution of burial goods in the cemetery. Even though there is an equal number of individuals in each group, Group 2 burials received 70.83% of the gifts (Table 6.22). The greatest disparity is in the unequal distribution of skyphoi. However, these observations must be skewed because of the large number of badly fragmented grave goods deposited in the Group 1 graves. Even if all the burial gifts are considered, there is only a small positive correlation between the distribution of goods still results (n=0.137; Table 6.23). It is certain that this pattern is the unfortunate result of post-depositional effects and the early date of the site.

	Group 1	Group 2
Group 1	1	
Group 2	0.13717582	1

Table 6.23. The degree of similarity between the distribution of burial gifts in the two disposal areas at Souphli.

At this point it would be beneficial to take a broader look at the differences in mortuary treatment between the two groups. A study of the energy expended in the mortuary treatment at Souphli serves to compare the two groups on a more inclusive scale (cf. Fowler in press). A spatial comparison of the levels of energy expended in the mortuary treatment of the two groups shows little variation. In fact, the two groups prove to be quite similar, with a high positive correlation (Table 6.24). This correlation better takes into account the overall pattern of mortuary differentiation at the cemetery. As a result, some degree of homogeneity in the mortuary treatment at Souphli can be hypothesized, irrespective of acute variability in the specific aspects of the mortuary treatment.

	"Group"		
Ranking	1	2	Total
1	0	2	2
2	9	6	15
3	0	1	1
Total	9	9	18
Similarity	0.98198		

***Table 6.24.** The spatial relationship in the levels of energy expended in the mortuary treatments at Souphli.*

6. Symbolic Designations

To determine possible symbolic constraints on the mortuary behavior at Souphli, an analysis of the energy expended in mortuary treatment was employed. This analysis took into account both the total observable energies expended in the mortuary ritual, and the labour expended in the material contribution to ritual.

EX Value	"Group"		
Value Index	1	2	Total
25	0	1	1
23	0	1	1
15	2	1	3
14	0	1	1
13	0	2	2
10	7	3	10
Total	9	9	18

Table 6.25. *The distribution of valued symbols in the Souphli cemetery.*

Three patterns of constraint are expressed in the material contribution to ritual at Souphli (Table 6.25). First, the high scores of 25 and 23 were received by the two individuals in Grave 10 (in Group 2). These individuals differ from the next closest scores by a minimum of 8 points. This is significant, because even the difference between the third highest score (n=15) and the lowest score (n=10) is not as great. Therefore, a very large amount of energy was expended in the material contribution to these individual's burials. It would be expected that these were high ranking individuals in the community. It is suggested that the individuals with rank scores of 23 and 25 held high rank or prestige statuses in the community. A second disparity can be seen between the index scores of 10 and 15. These intermediate scores were only achieved by those buried in Group 2. A third pattern suggests that differential access to status was reflected in the spatial location of the burials. In Group 1, 77.7% of the graves had the lowest score in the index, while Group 2 graves had only 33.3% in the lowest index score. Therefore, in general, a greater amount of energy was expended in the material contribution to Group 2 graves.

Fr #	"Group"	EXI Score	Ranking
10a (upper)	2g	40	1
10b (lower)	2g	35	1
5	1	29	2
14	2	28	2
13	2	27	2
7 lower	1	26	2
2	1	24	2
11	2	24	2
12	2	24	2
1	1	22	2
9	2	22	2
8	1	21	2
7 upper	1	20	2
3	1	19	2
4	1	19	2
6	1	19	2
Int-1	2z	19	2
Int-2	2e	15	3

***Table 6.26.** The distribution of energy expenditure in the Souphli cemetery.*

Overall, three different levels of energy expenditure characterize the mortuary treatment at Souphli (Table 6.26). Two individuals compose the first level (11.11%), fifteen belong in the second (83.33%), and one individual is in the third level (5.0%). This distribution of energy expenditure scores suggests that three social rank levels can be hypothesized for Souphli. These rank levels do not conform to a hierarchical distribution pyramid, however, as the number of individuals does not increase as the rank level decreases. This analysis does, however, conform to the expectations of the frequency-distribution analysis, which predicted three levels of rank or status differentiation in the society.

This pattern of the rank grading at Souphli does not appear to be solely a result of biological factors (Table 6.27). Males and females are represented in the first and second rank categories. However, with only three sexed individuals, it is difficult to determine if sex played a significant role in rank determination. On the other hand, constraint to a particular rank level according to age is more visible. An adult male is found only in rank level one. The unidentified female, therefore, may also be of adult age. Only one infant, the inhumation burial, belongs to rank level three. Another identified infant belongs to rank level two. Therefore, the lower status infant died without achieving the most common status accorded members of this community (that of the second rank level).

	Rank Level			
Age-Sex	1	2	3	Total
Adult Female	0	1	0	1
Adult Male	1	1	0	2
undiff. Adult	0	1	0	1
undiff. Sub-adult	0	1	0	1
undiff. Juvenile	0	2	0	2
Female Juvenile	0	1	0	1
undiff. Infant	0	1	1	2
undiff. Female	1	0	0	1
undiff.	0	7	0	7
Total	2	15	1	18

Table 6.27. Distribution of rank level by age and sex.

7. Mortuary Differentiation and Social Distinctions

a) Normative Mortuary Treatment

Overall, Souphli has a relatively homogeneous mortuary complex (Table 6.28). The burial facilities are roughly circular pits, averaging 0.18 m^3 in volume, with earth floors. The burials are located in a formal cemetery, with two discernible disposal areas: one group in the southeast and another in the northwest near the crematoriums. Most individuals were cremated before being interred at Souphli. Only in two cases were bodies inhumed. Cremated remains were placed in burial urns, and disposed in a solitary pit. The two inhumation burials were not modified before interment and were laid to rest in only slightly larger pits.

I proposed above that the cremated remains may have gone through a two-stage preparation procedure (secondary burial scenario). The condition of the cremated material suggests that several bodies were initially defleshed before being cremated. This is not the norm, however, and it appears that most of the mortuary population was completely articulated when cremated. The dorsal, or back, side of the individuals appears to have had more contact with flame, or intense heat. This suggests that individuals were suspended above the fire on their backs rather than their fronts. The small range of bone elements represented in the burial urns, further suggests that only certain bones were selected to be placed in the urns for final burial.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Shape	roughly circular
	Avg. Volume (m^3)	0.18 m^3
	Floor	earth
	Formal Disposal Type	cemetery
	Special Features	crematorium
Preparation and Treatment	Age-Sex Categories	skewed due to skeletal preservation
	Interment Type	cremation
	Posture	n/a
	Orientation	n/a
	PBA	n/a
	Cultural Modification	defleshing? and cremation
Burial Scenario	Interment Form	single burial
	Ritual Process	secondary burial
Burial Goods	Raw Material	pottery
	Avg. #/interment	0.5
	Source	local manufacture
	Distance	local
	Manufacture	locally-made goods
	Function	sociotechnic/technomic

Table 6.28. The normative mortuary treatment exhibited by the burials at Souphli.

Most of the gifts in the cemetery were pottery. Numerous individuals received no burial gifts upon final interment. The average gift per grave is 0.5 per grave. All gifts appear to be of local manufacture. The resources required to manufacture these goods could have been acquired within the local region of exploitation. It is highly unlikely that any of the burial furniture represented at Souphli was acquired through trade and/or exchange. The unique feature of the burial furniture at this cemetery is the discovery of stone and bone tools, and unique pottery types around the crematorium area. Above, I proposed that these artifacts may have had a role in the preparation of the bodies before cremation, functioning as ritual "tools." Also unique is the limited range of artifact types that were used for burial urns (mainly skyphoi) and burial goods (amphorae). This suggests that burial urns and most burial gifts did not function as socio-economic markers. Unique artifact types, such as the fruit stand and mini-vases, acted as sociotechnic items to differentiate individuals.

Overall, mortuary differentiation at Souphli is illustrated by:

1. differential pre-interment treatment of the dead;
2. the use of cremation and inhumation burial practices;
3. a disparity in the distribution of grave goods, and the specific allocation of certain goods to certain individuals;
4. three "wealth" levels represented by the frequency-distribution of burial gifts;
5. two spatially distinct disposal areas, characterized by similar level of energy expenditure, but with different details in the method of preparing and treating the body; and
6. three different levels of energy expended in the mortuary treatment.

b) *Social Distinctions*

(1) Vertical Social Distinctions

All three dimensions of social distinctions were represented at Souphli. A study of the formal, symbolic, and artifact differentiation in the Souphli cemetery identified three social rank levels. The frequency-distribution analysis of the burial gifts at Souphli revealed a three-tiered dispersal of grave goods. This pattern represents a three-level system of achieved status, signifying differential access to resources. When the results of these two analyses were combined, it allowed three more specific vertical social statuses to be identified (Table 6.30).

Fr #	EXI Score	Rank	# Goods	Age-Sex
10a (upper)	40	1	2	undiff. Female
10b (lower)	35	1	2	Adult Male
5	29	2	1	undiff. Juvenile
14	28	2	1	undiff. Juvenile
13	27	2	1	undiff.
7 lower	26	2	1	Female Juvenile
11	24	2	1	Adult Female
2	24	2	0	undiff.
12	24	2	0	undiff. Infant
1	22	2	0	undiff.
9	22	2	0	undiff.
8	21	2	0	Adult Male
7 upper	20	2	0	undiff.
3	19	2	0	undiff.
4	19	2	0	undiff.
6	19	2	0	undiff. Sub-adult
Int-1	19	2	1	undiff. Adult
Int-2	15	3	0	undiff. Infant

Table 6.29. Rank and status differentiation at Souphli.

Vertical social distinctions (social rank and status; Table 6.29) are generally characterized by high energy expenditure and the use of valued symbols. In the first rank level, individuals were given a high level of energy expenditure, valued symbols, and the most grave goods. The second rank level is defined by moderate energy expenditure, the use of valued symbols, and the either the presence or absence of grave goods. The differential frequency of grave goods in the second rank level reveals three finer status distinctions. The upper status is defined by moderate energy expenditure and the presence of one grave good. Five individuals belong in this status category. The middle status is characterized by moderate energy expenditure and the absence of grave goods. Nine individuals belong to this status level. One individual belongs in the lower status level. This status is characterized by the lowest level of energy expenditure in the second rank level and the presence of one grave good. The third rank level is illustrated by a low level of energy expenditure and the absence of burial gifts.

Access to most of these vertical social positions does not appear restricted according to age. An adult male and a female belong to the upper rank level. Due to the indeterminate sex of most individuals in this mortuary population, only age restrictions could be assessed. No restrictions according to age could be determined. The middle level is composed of adults, sub-adults, juveniles, and individuals of indeterminate age and sex. The lower level is made up of adults, sub-adults, infants, and individuals of indeterminate age or sex. The only restriction according to age appears in the third rank level, where one infant was identified.

Several types of elevated social positions were discernible from constraints placed upon the treatment of individuals at Souphli (Table 6.30). Two adults were formally, symbolically, and artifactually treated much differently than others buried in the cemetery. The status of these individuals is defined by their position in the first rank level, the upper wealth category, and the high levels of energy expended in their mortuary treatment. Two other individuals of juvenile age were also treated disproportionately than others in the cemetery. These juveniles received a moderate level of energy expenditure, belong in the middle wealth category, were located near to the individuals of high rank in the cemetery, and were allocated valued goods. This pattern signifies the allocation of some elevated social position to these two young individuals. However, because they only belong to the middle rank level it is difficult to suggest that their status was ascribed through lines of heredity.

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation	Comments
Vertical						
Achieved Wealth (or preferential access to resources)						
Upper	2	Adult/ Indeterminate	Male/Female		2 grave goods	
Middle	6	Adult/Juvenile/ Indeterminate	Male/Female		1 grave good	
Lower	10	All except Juveniles	Male/ Indeterminate		no grave goods	
Elevated Social Positions						
Special Prestige Positions	2	Adult	Female/Male	high energy expenditure; location of burial	valued goods; upper wealth category	
	5	Adult/Juveniles/ Undifferentiated	Female/ Indeterminate	moderate energy expenditure; burial location	valued goods; middle wealth category	
Horizontal						
Corporate Group	1	All ages	Male/Female	Location of graves		
Female Status	4	All	Female		mini-vases	
Age status	2	Juvenile and Indeterminate	Indeterminate	moderate energy expenditure; middle wealth category; burial location	fruit stand/ indeterminate decorated vessel	
Special Status						
Alternative adult treatment	1	Adult	Indeterminate	moderate energy expenditure; inhumation burial	valued symbol (figurine); middle wealth category	alternative treatment
Circumstances of Death?	1	Infant	Indeterminate	inhumation; low energy expenditure	no grave goods	alternative treatment

Table 6.30. *The dimensions of social distinctions represented at the Souphli cemetery.*

(2) Horizontal Social Distinctions

Two types of horizontal social distinctions were discernible at Souphli (Table 6.30). First, is the presence of a socio-economic group. Even though two spatially distinct disposal areas were observed, the general differences between them are not enough to suggest two corporate groups. The only major difference was in the degree of bone incineration between the two areas. This may partially be explained by the technology used in cremation. It is more likely that the individuals in Group 1 were cremated using Crematorium A. The method of suspending the body over the fire (as evidenced by the post-holes on the edge of the pit) would have resulted in less intensely burnt bone. On the other hand, the individuals located in Group 2 were probably cremated in Crematorium B, which, with its brick walls and lack of suspension apparatus, would have produced more intensely burnt bone. Furthermore, it is not consistent with the other formal, symbolic, artifactual, and spatial data to have two corporate groups of such small size (n=9). It is more plausible that two different kinship groups are represented at Souphli. In his Galley Pond study, Binford (1964) suggested that two moieties are represented when two spatially distinct groups are present in the same cemetery, and each group has roughly equal numbers of individuals. This is similar to the pattern at Souphli. These two kin groups would be distantly related to a common ancestor, and it would not be unusual to find them inhabiting the same settlement. Although the evidence for this kinship distinction is much weaker at Souphli than it was at Galley Pond, it does suggest one possible explanation for the spatial distribution of burials in the cemetery.

Other group differentiation at Souphli is suggested by constraints in artifact distribution. As mentioned above, only females seem to have received the mini-vases in their burial assemblages. This pattern of constraint can best be interpreted as the symbolic representation of status bestowed to only females in the Souphli community.

(3) Special Status Distinctions

The treatment and grave gifts given one individual also suggests a more specialized social distinction (Table 6.29 and 6.30). The adult buried in Grave 10 received an alternative treatment at Souphli (see Illus. 6.16). This individual was inhumed in a pit grave, received a very low amount of energy expended in the mortuary treatment, belongs in the middle wealth category, but was given a valued symbol. This pattern contradicts the normative treatment at Souphli. However, two explanations for this alternative mortuary treatment can be proposed. First, that this adult held a position of ritual office in the Souphli community. Due to their unique position in the community, it would not be unusual to observe ritual practitioners (such as shamans) receiving a mortuary treatment that expressed both social membership and exclusion. The inclusion of this individual in the cemetery and his or her place in the middle wealth category suggests membership in the community as a whole. However, the low level of energy expenditure, and the practice of inhumation is incongruent with normative mortuary treatment at Souphli. This indicates distinctiveness, deviance, or social exclusion. Second, it has repeatedly been observed that alternative mortuary treatments are indicative of social deviance (Saxe 1970; O'Shea 1984). In this case, the presence of a female figurine with this individual may indicate deviance in gender norms. However, because of the absence of the defining female status item (mini-vessel), it is likely that this individual was male. Therefore, given the present evidence, the first hypothesis is the most tenable.

An alternative mortuary treatment was also accorded the low ranking infant in the Souphli cemetery (Table 6.29 and 6.30). This infant was inhumed, received low energy expenditure in mortuary treatment, and was given no grave goods. Two possible reasons can be offered for this unique occurrence. First, because the treatment of this infant deviates radically from the other infant in the cemetery, it is possible that the alternative treatment was given due to the circumstances surrounding the infant's death. For a variety of reasons, such as disease, accident, or otherwise, it may have been taboo to cremate an individual who had died an "unnatural" or "unexplainable" death.

Notes to Chapter 6

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1 A correspondance with Dr. Tracey Cullen (primarily that of 11 October 1996) updated and elaborated upon the data presented in Jabcobsen and Cullen (1981). Dr. Cullen took the time to go through copies of the fieldnotes made on the recorded burials and their contents. Through this correspondance I was also updated on Della Collins Cook's ongoing work at the Nauplion museum were the excavation materials are stored. Dr. Cullen's help in clarifying this material for me is gratefully acknowleged.

2 There is little experimental data on the length of time it would taken to excavate simple pit burials of various sizes. Based upon my personal experience in the construction industry and upon the loose calculations in Atkinson (1961) and Wright (1987) it was estimated that it would take roughly six hours for one person to excavate (and remove the earth) a single $1m^3$ pit burial. Although this time may seem exaggerated, it is very likely that these individuals dug graves with little more than large animal scapula (cattle?). These time estimations were grouped into five categories with five associated rank divisions:

Volume	Time Estimate	Rank
1.1-1.5	> 6 hrs.	1
0.7-0.99	± 6 hrs.	2
0.4-0.69	≥ 4 hrs.	3
0.1-0.39	≥ 2 hrs.	4
<0.1	≥15 min.	5

3 Vladimir Milojčić discovered two Late Neolithic inhumation burials during a 1966 excavation (Milojčić 1967). These finds will not be discussed here. The two inhumations are singular finds, and the quantity and quality of contextual information necessary for this analysis was not present in Milojčić's report. Also consult citeria for the inclusion of mortuary data for this analysis as discussed in Chapter 1.

4 It is possible that these inhumation burials are intrusive (Gallis 1989). However, they would not date any later than the EN-early MN transition phase. If these burials are intrusive, it is curious that they were placed in the location of a previous cemetery. In the analysis that follows, these burials are considered to be roughly

contemporary with the cremations, and represent a change in mortuary custom, not cultural change.

[5] Caution must be taken with this statement, as it probable the two groups are not that statistically different (Fisher exact p=0.36).

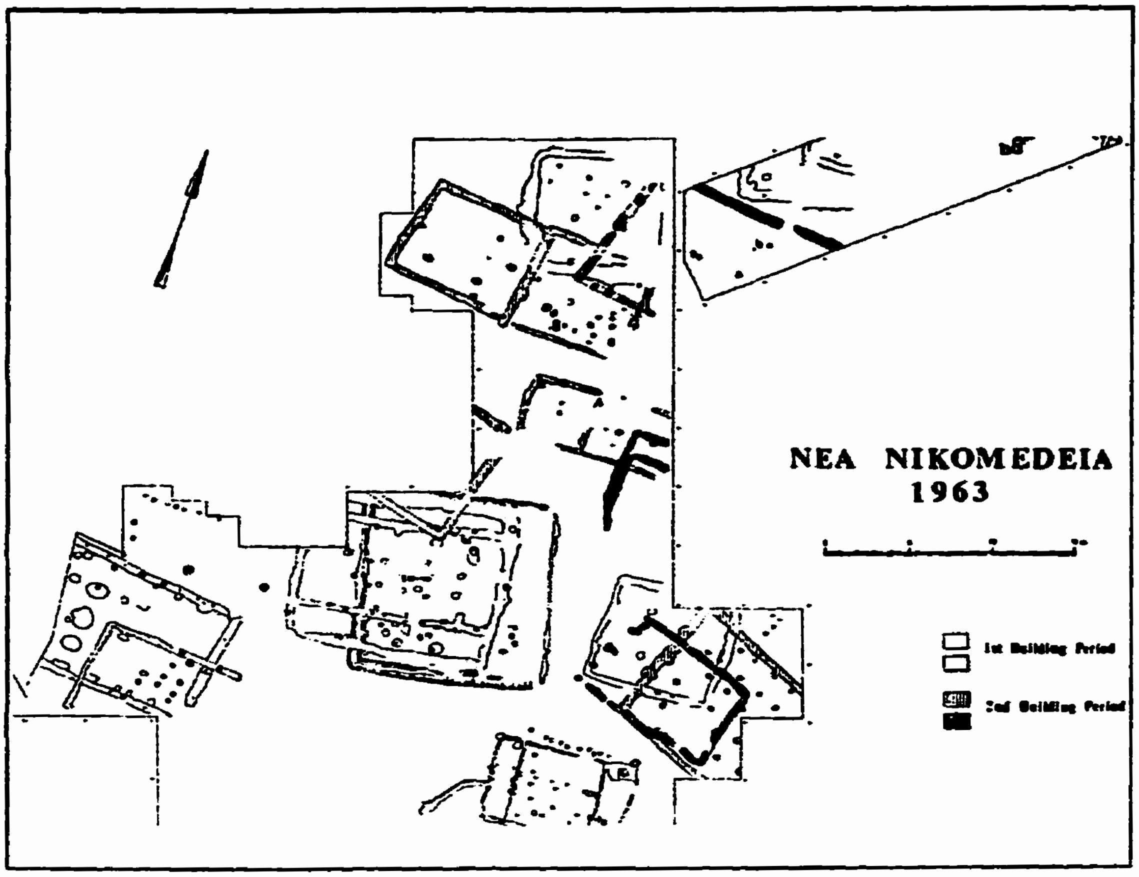


Illustration 6.1. Plan of EN Nea Nikomedia showing an "agglomerative" settlement plan. Source: Rodden (1964:115).

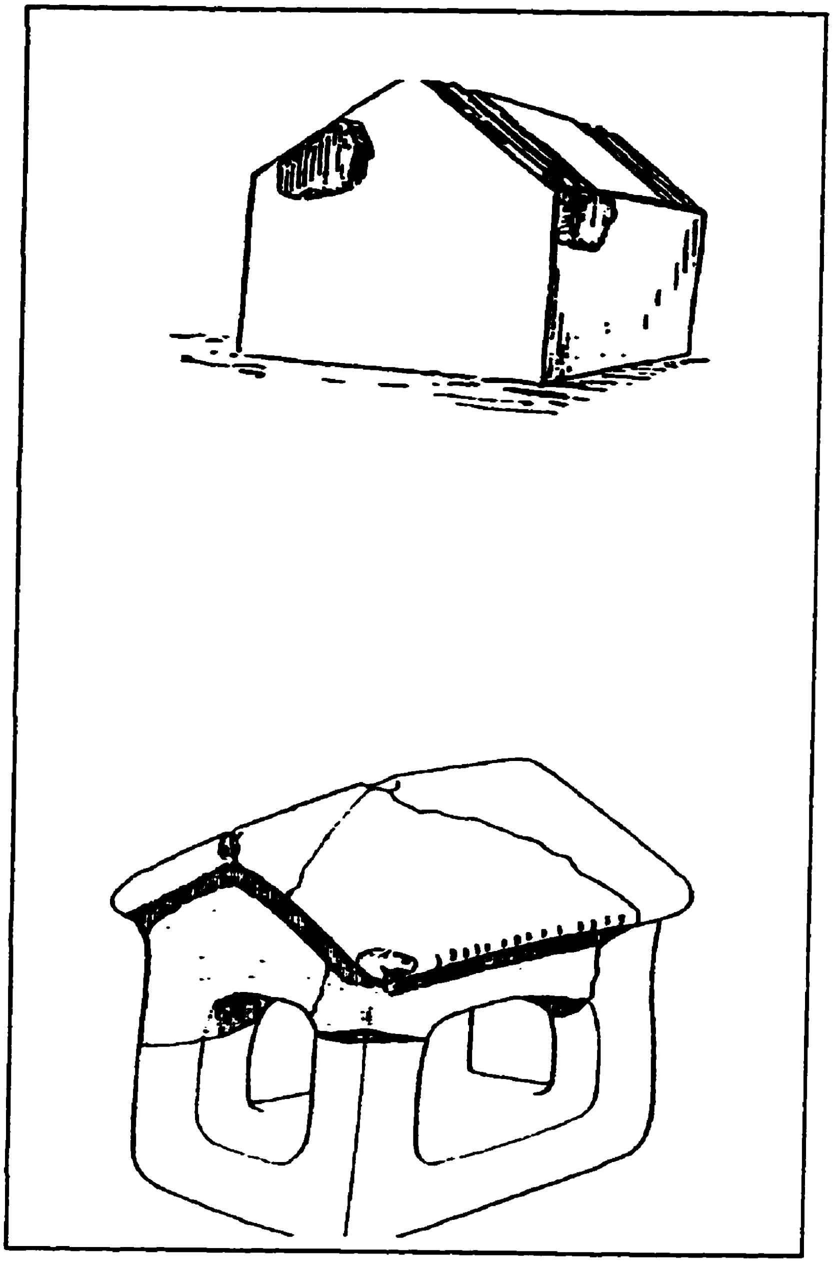


Illustration 6.2. Upper: *reconstruction of small house at EN Sesklo (Tsountas 1908);* Lower: *EN clay house model reconstructed from upper section (Theocharis 1977:323).*

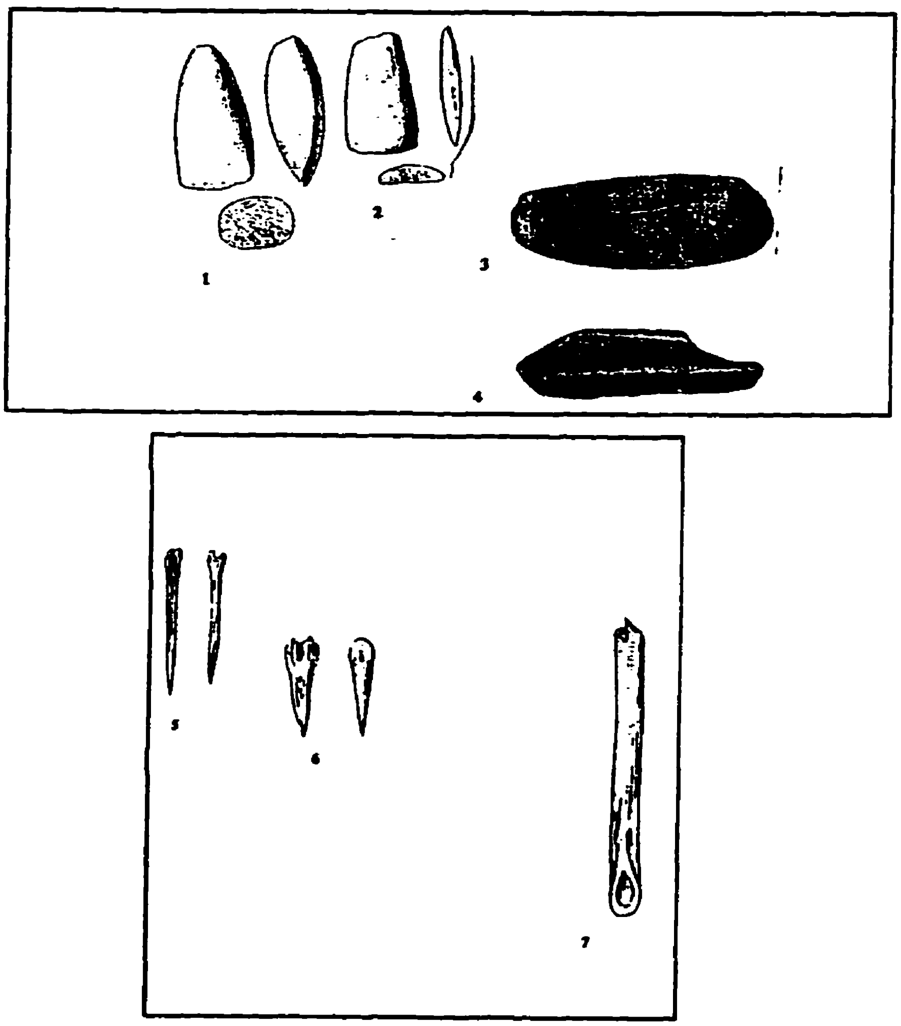


Illustration 6.3. Early Neolithic stone and bone implements: Seskio (1-4) (Tsoutas 1908); Franchthi (5-7) (Jacobsen 1976). Source: based on Demoule and Perlès(1993).

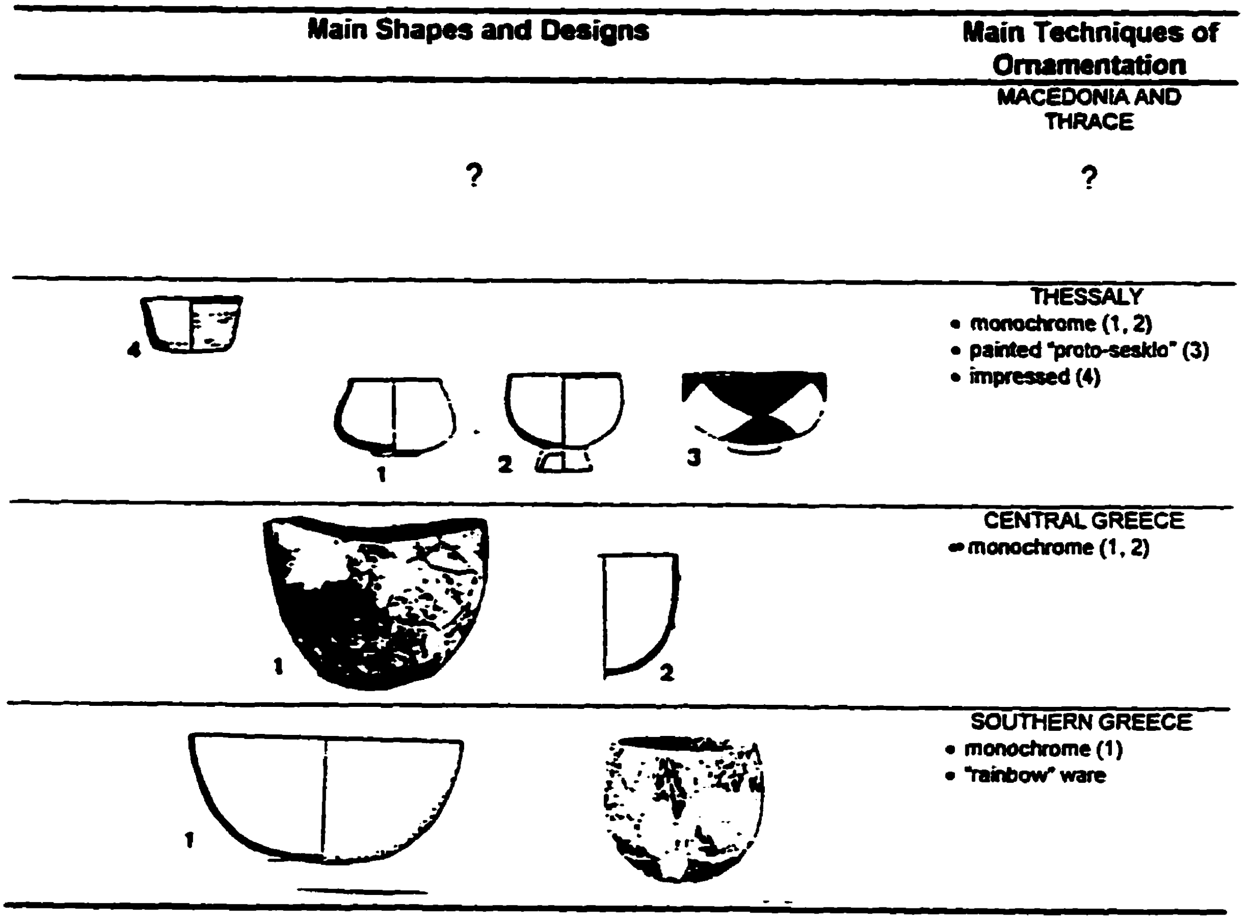


Illustration 6.4. The principle regional ceramics of the Early Neolithic Period. Source: Demoule and Perlès 1993.

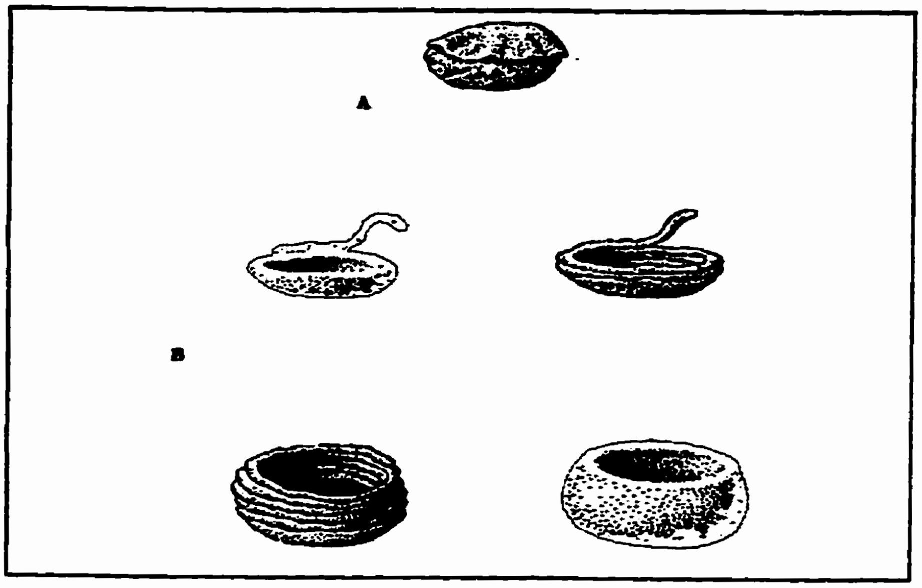


Illustration 6.5. Examples of potting techniques: a) modeling, which can be accomplished by shaping the clay over a stone; and b) coiling onto a molded base to create the walls of a vessel. Source: Knudson (1978:265).

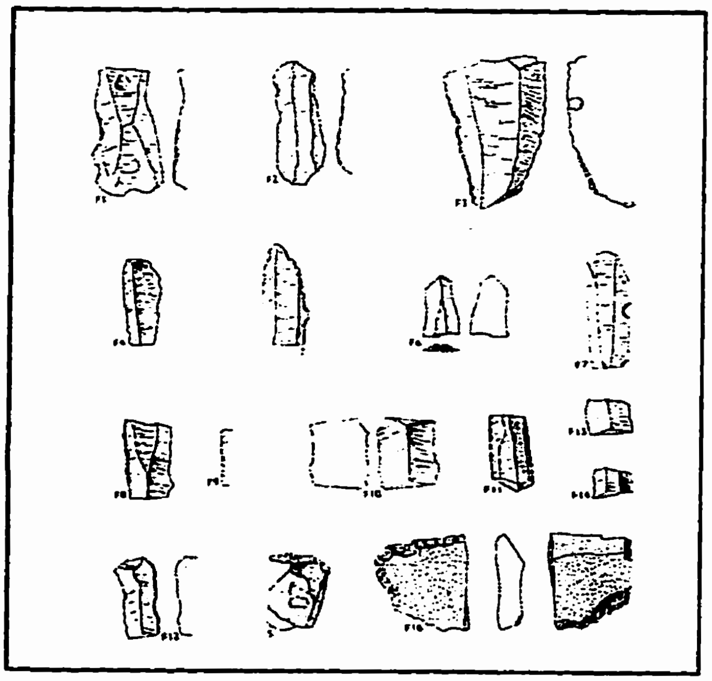


Illustration 6.6. Early Neolithic flint implements from Nea Nikomedia: (F1-4) worn blades and flakes; (F5) serrated blade; (F6) "microburin"; (F7) notched blade; (F8-12) sickle insets; (F13,14) trapezoidal blade segments; (F15,16) scrapers on struck flakes. Scale: 2:3. Source: Rodden 1962:Fig. 6).

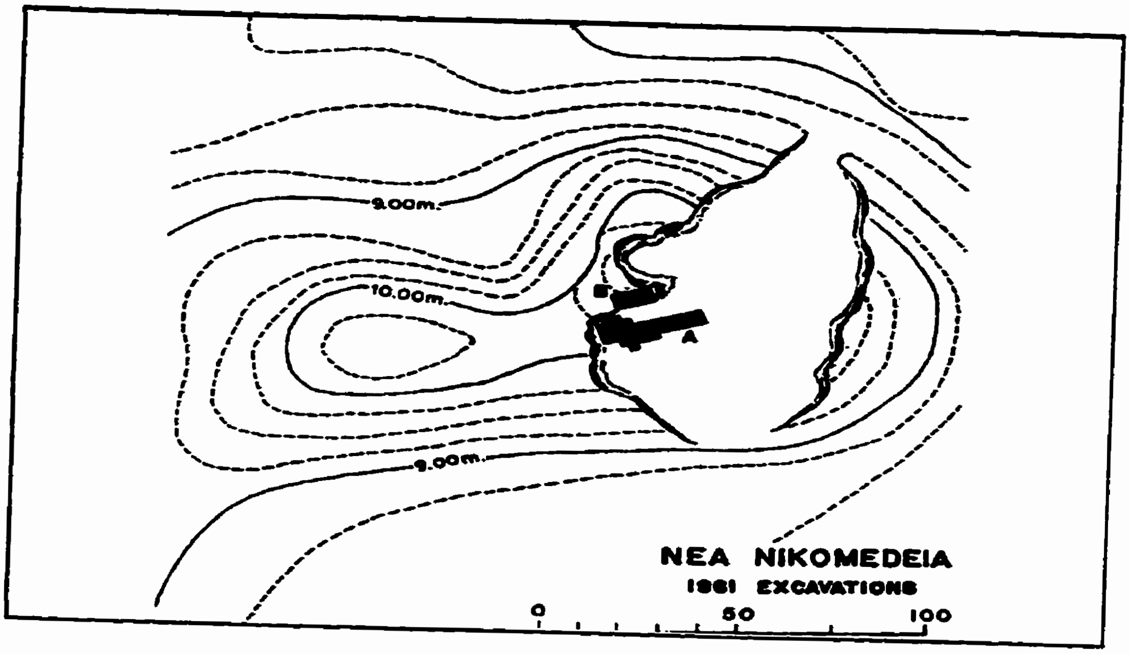


Illustration 6.7. Schematic map of the Nea Nikomedia excavation of 1961. Source: Rodden 1962:Fig. 1).

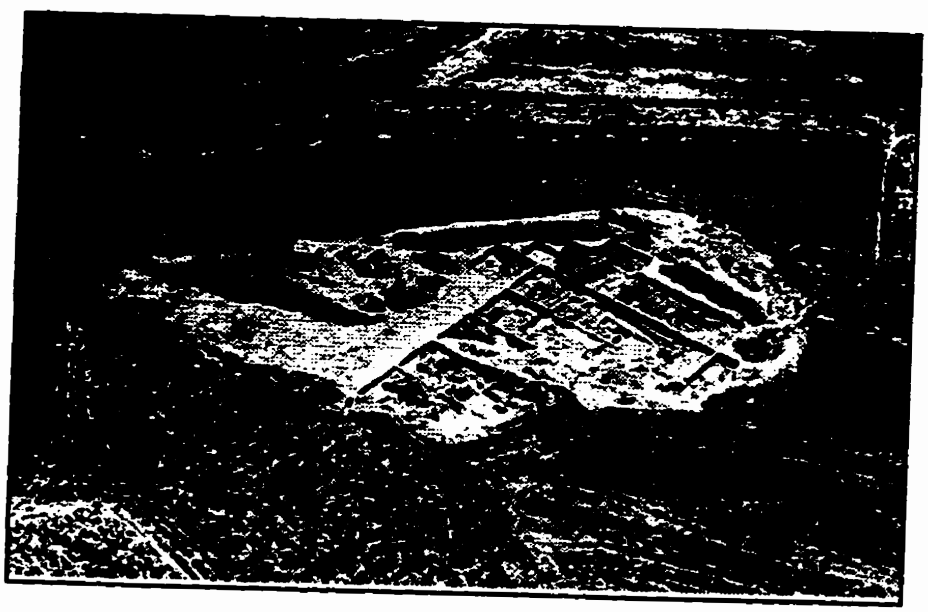


Illustration 6.8. Aerial view of the eastern half of Nea Nikomedia after the 1963 excavations. Source: Rodden 1964: Illustration 1B.

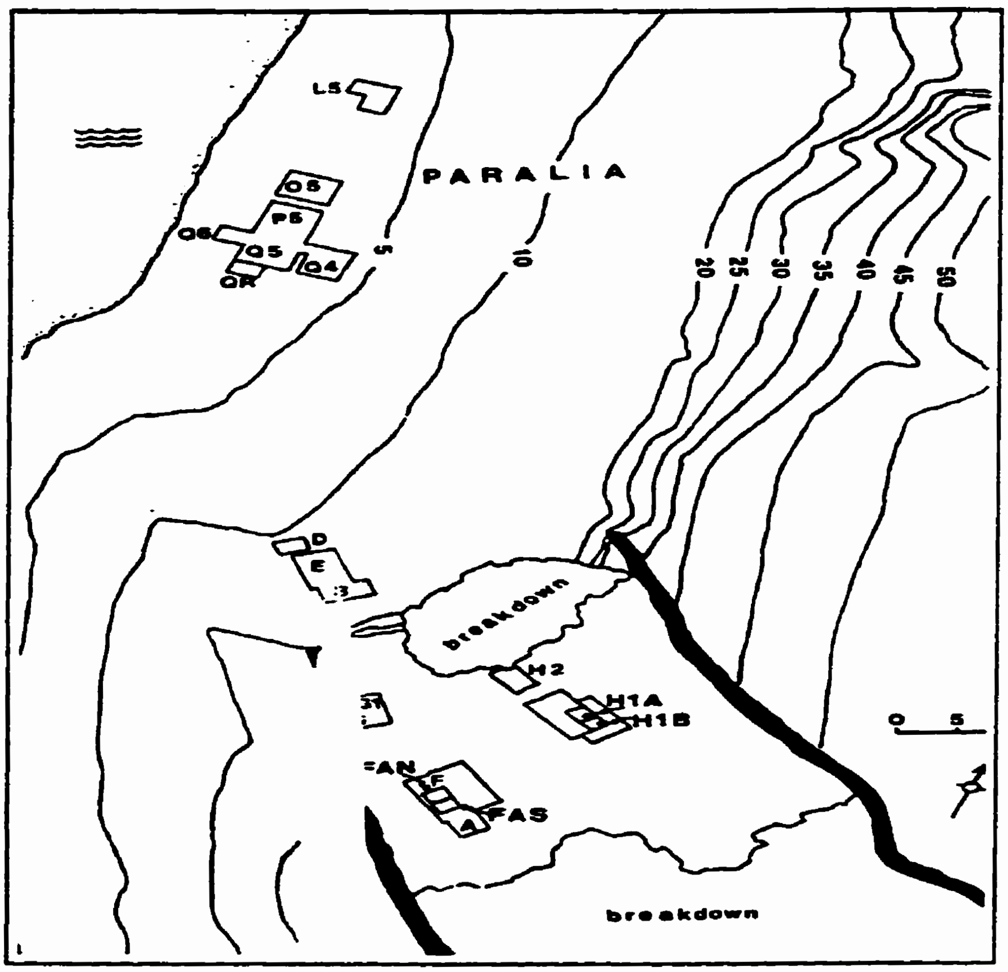


Illustration 6.9. Excavated areas of Francthi cave and paralia. Source: Hansen (1991:Fig. 3).

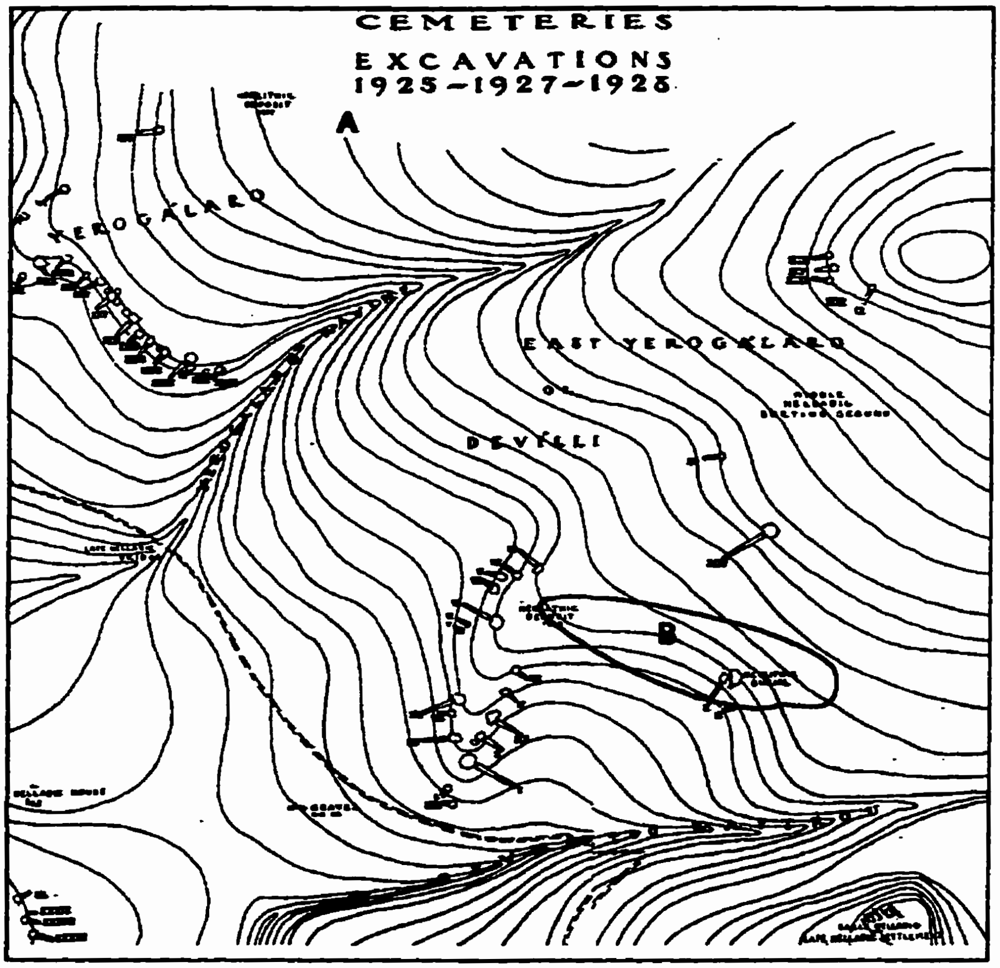


Illustration 6.10. The site and environs of Prosymna: A) West EN deposits; B) East EN deposits. After Blegen 1937:Fig. 1.

Illustration 6.11. Entrance to the Prosymna cave. After Blegen 1937:Fig. 27.

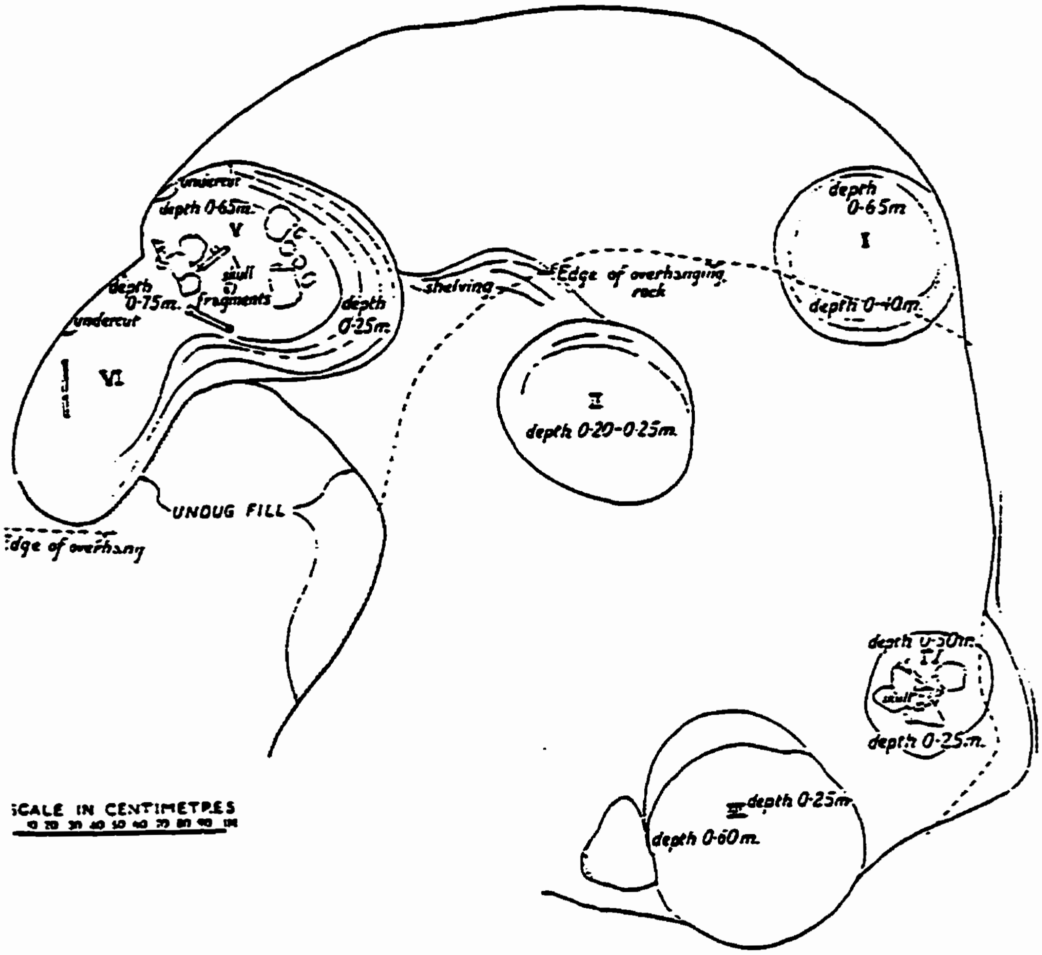


Illustration 6.12. Plan of the EN cave cemetery at Prosymna. After Blegen 1937:Fig. 28.

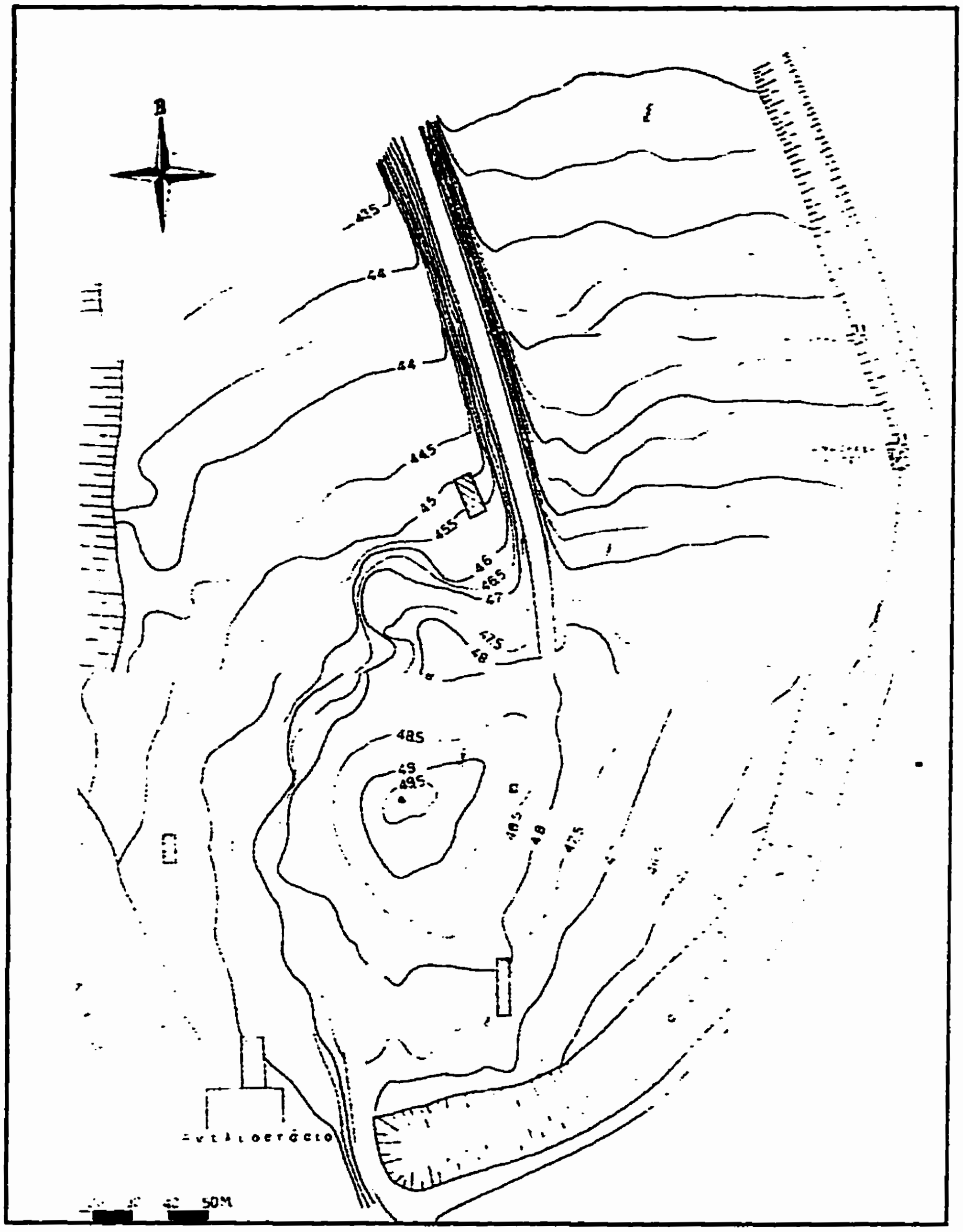


Illustration 6.13. Plan of Souphli Magoula. Source: Gallis 1982: Fig. 2

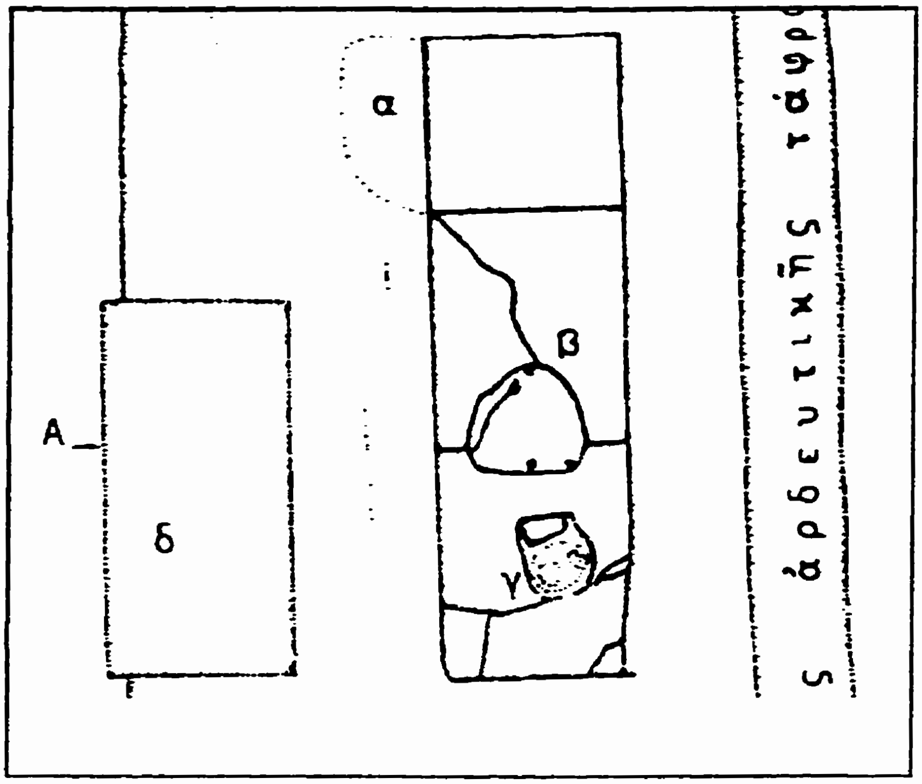


Illustration 6.14. Souphli Magoula "Group 2" graves. Source: Gallis 1982: Fig. 6.

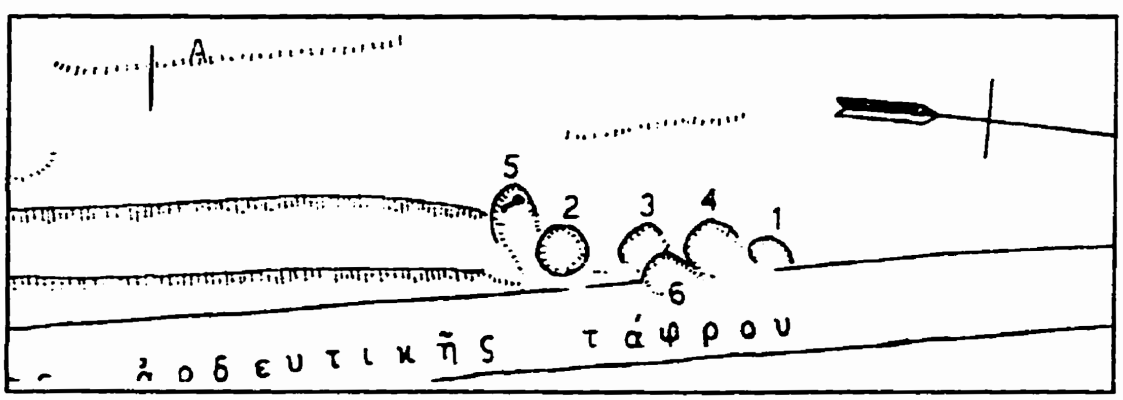


Illustration 6.15. Souphli Magoula "Group 1" Graves. Source: Gallis 1982: Fig. 3

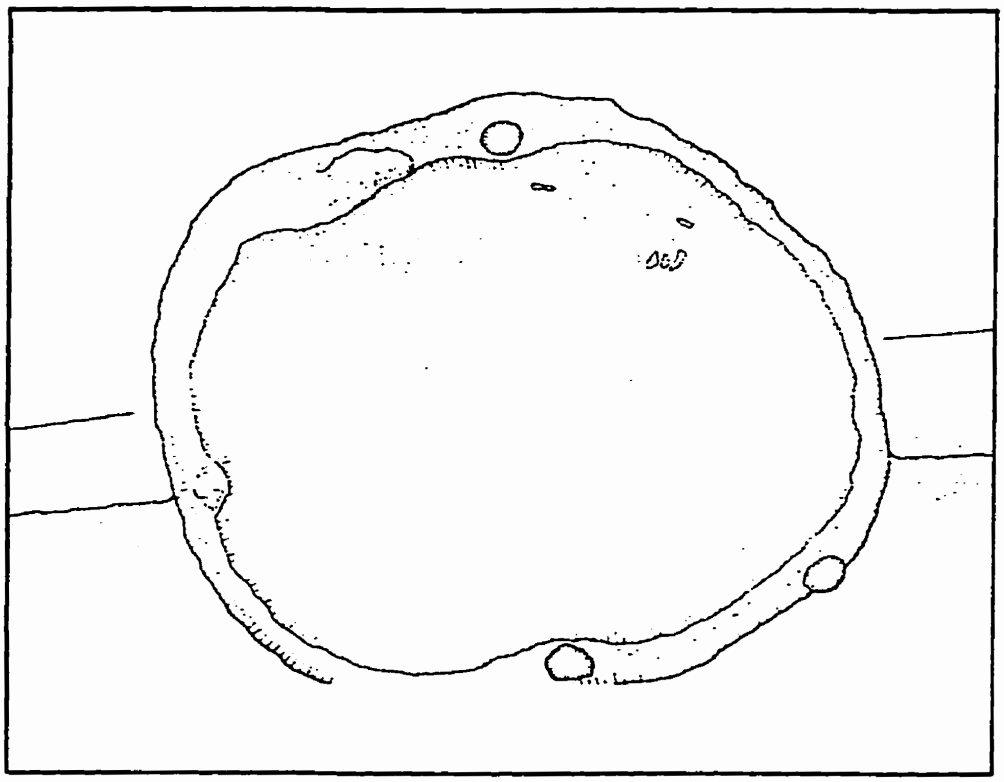


Illustration 6.16. Crematorium A at Souphli Magoula. Source: Gallis 1982: Fig. 7.

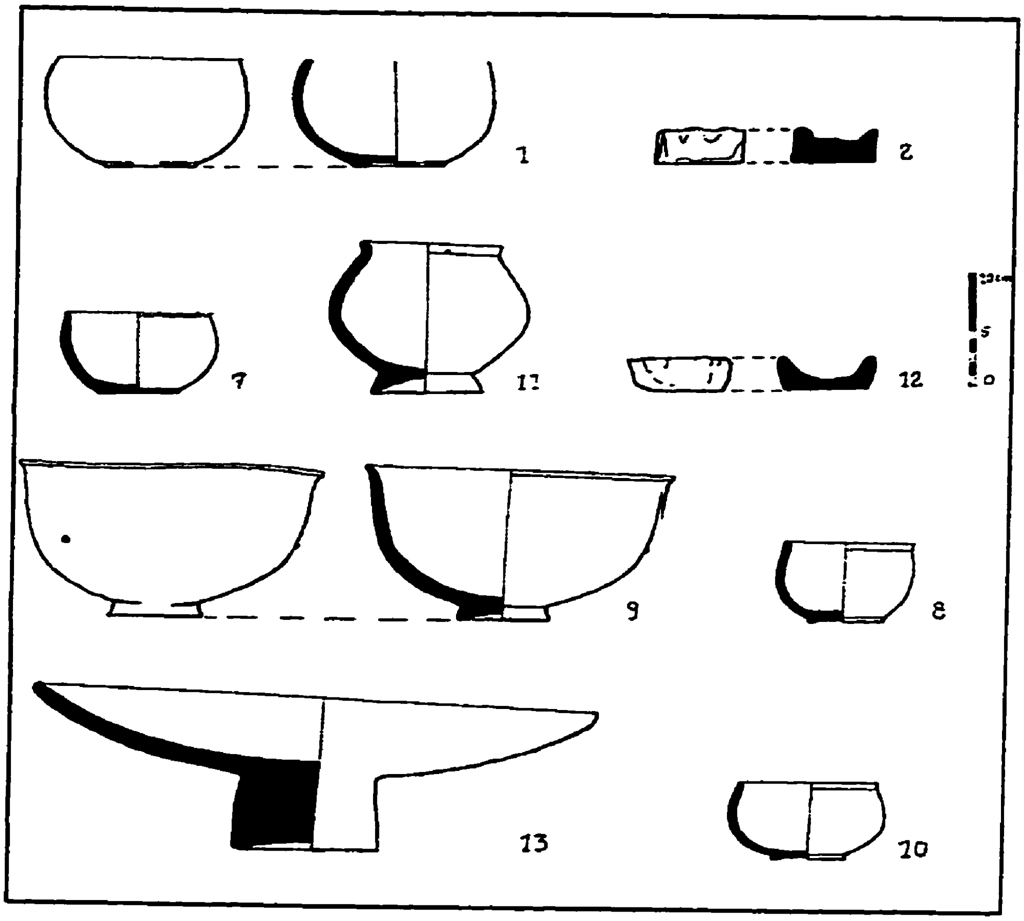


Illustration 6.17. Types of ceramics found in mortuary contexts at Souphli Magoula. Source: Gallis 1982: 4

Illustration 6.18. Adult inhumation at Souphli Magoula. Source: Gallis 1982: Fig. 13.

CHAPTER 7

THE MIDDLE NEOLITHIC

I. Introduction to Middle Neolithic Material Culture

The radiocarbon dates for the MN cluster around 5800-5300 B.C., in calibrated calendar years (Demoule and Perlès 1993). As mentioned in the previous chapter, the MN seems to be part of a continuous development begun in the EN. As such, there is little difference between the MN and EN as far as settlement pattern and architecture, and domestic equipment is concerned. The significant differences come in the area of ceramic and stone tool production, as well as the development of a more complex system of trade and exchange.

A. Ceramic Production

In this phase, ceramic technology is aggressively explored, producing impressive developments and innovations. Unlike the EN, however, the ceramics are not as homogeneous throughout Greece (Demoule and Perlès 1993:377). Different fabrics were used for different types of wares for the first time in Greek prehistory (Vitelli 1989). This allowed a greater variety of more difficult shapes to be produced, such as carinated vessels, pyriform vases, basins with pedestals, and collared jars (Illus. 7.1). As well, the size of the vessels greatly increased. The firing temperatures were increased by several hundred degrees over the EN (above 800°C) (Maniatis and Tite 1981; Vitelli 1991), and numerous pots were now being fired together (Vitelli 1993).

The MN phase is also characterized by a greater diversity in decoration, which became more common and covered most of the pots. Different regional styles also began to develop. In the Peloponnese, monochrome, pattern-painted, and pattern-burnished Urfirnis wares were made, using iron-oxide pigments exclusively (Cullen 1985a, 1985b; Vitelli 1974, 1993). In Boeotia, painted and unpainted backgrounds were used for ceramics (Weinberg 1962). In Thessaly, the Sesklo pottery tradition continues, with geometric decoration in brown-red painted on a white to cream background (Kotsakis 1983; Mottier 1981). At Nea Nikomedia, in western Macedonia, a new range of decorations in brown-red on a light slip predominates (Washburn 1984). Besides the painted wares, the first coarse wares make their appearance into ceramic assemblages. These were repeatedly used on fires, based on repetitive burn marks (Vitelli 1989, 1991), but are still very uncommon, totaling only 5-10% of all types (Demoule and Perlès 1993:381).

This obvious dichotomy between the "fine" wares and the coarse wares has led researchers to think in socioeconomic terms. The distinctiveness of local fabrics has been interpreted as having the intensive objective of creating visible, characterizing social symbols (Vitelli 1991), or as displaying links within growing local and regional social systems (Cullen 1985a, 1985b; Perlès 1992), rather than local experimentation and trade in technology. The small and selective exchange of local ceramics, apparently to avoid inter-settlement conflicts (Cullen 1985a, 1985b), cannot simply be boxed into a network of social relationships. There should be caution taken in such interpretive approaches, as symbolic or reciprocal exchange is far more difficult to monitor than simply tracing the goods that are exchanged (Greenfield 1991). For example, it must first be asked, as I attempt in this thesis, what the character of Neolithic society is like, before moving on to questions of regional social relations. Nevertheless, it is apparent at this point, that some degree of craft specialization is shown by the range and high level of craftsmanship needed to produce the ceramic wares developed in the MN.

B. Stone Tool Production

The tool-kit from the MN differs significantly from the EN kit in that retouching was employed with greater frequency (Elster 1989; Moundrea Agrafioti 1981, 1993; Perlès and Vaughan 1983). Obsidian blades and sickle blades were now commonly retouched, undergoing numerous periods of use and reuse. Due to the nature of obsidian, it was retouched only marginally. During this phase, bifacial, transverse arrowheads were commonly used, and eventually were worked into asymmetrical points with a lateral notch by the end of the phase (Illus. 7.2) As with the ceramic assemblage, craft specialization is apparent in the making of the flaked tools. As flint-knappers know, the technique of pressure-flaking is a difficult one. It is noteworthy that even with a low production rate, the frequency of errors in the blades is almost undetectable (Demoule and Perlès 1993:383).

C. Trade and Exchange

Although the exchange of ceramics has been addressed somewhat above, it must be noted that even with the weak hypothesis on the social significance of pottery, relationships between neighboring Neolithic societies were becoming more manifest in terms of cultural material. How exactly this relates to the workings of social systems has yet to be significantly addressed. Still, in the MN, the range of trade in lithics was comparable to other artifact types. Although the origins and patterns of circulation for all the flaked stone have yet to be studied, Demoule and Perlès have suggested three systems of exchange which took place during the MN:

1. Stone tools: including flaked, polished, or ground stone tools. These are considered utilitarian goods with a common "style" throughout Greece. The material was circulated over a large area, and was probably procured and produced by a small group of part-time specialists.
2. Ceramics: including the decorated and coarse wares. These are characterized by clear and deliberate styles which fall into distinct regional boundaries, where little of the material was circulated. All types were manufactured locally with local materials.
3. Specialty Items (Illus. 7.3): include stone seals and vases, and stone and shell ornaments. These are thought to be symbolic or prestige items (Demoule and Perlès 1993:384), with no real stylistic distinctions. The unusual characteristic of these items is the rarity of the materials, which, once manufactured, were not exchanged over wide distances. Perhaps also significant is the rarity with which these items appear in the grave assemblages.

II. Analysis of the Middle Neolithic Mortuary Remains

There are several sites on the Greek mainland that have burials dating to the MN phase (Chaironeia, Aghorghitika, Lerna, Franchthi Cave). However, only one or two burials have been recovered from most of these sites. Only one site has a well-documented and large sample size to be analyzed. Below, the early MN burials at Franchthi Cave will described.

A. Franchthi Cave

1. Formal Treatment

a) The Burial Facility

The MN transition mortuary sample at Franchthi is composed of five individual burials (Table 7.1). Three interments were found in the Paralia area, and two others within the cave (see Illus. 6.8). As with the other Franchthi burials, none of the grave dimensions were recorded by the excavators, and pits were assumed to have held the skeletal remains (Cullen, personal communication). Therefore, neither the grave type, shape, or dimensions are given in the burial descriptions below. One of the graves (Fr. 48), may have been a lined pit, but this was not assigned with confidence. Two of the graves located in the cave were covered with a large "cap-stone" to cover the skeletal remains. Beyond this, there was no other evidence of the mortuary burial facilities (Cullen, personal communication).

b) Preparation and Treatment

All interments are single, primary inhumation burials (Table 7.1). As noted above, only two in the cave burials were made more elaborate by covering the body with stone slabs. There is variation in the posture and orientation of the skeletal remains. Individuals in the cave appear to have been interred on their right or left side in a semi-flexed position.

Date	Fr#	Facility	Enhancements	Location	Posture	Orientation	PBA	Scenario	Age-Sex
early MN	31	indeterminate	indeterminate	Cave	front	SE-NW	disturbed	single	subadult female
early MN	48	Lined pit?	cap stone	Cave	left side	S-N	semi-flexed	single	neonate
early MN	66	Pit	cap stone	Cave	right side	SW-NE	semi-flexed	single	infant
MN	59	Pit	none	Paralia	right side	NE	flexed	single	adult female
MN?	18	Pit?	none	Paralia	right side	NW-SE	flexed	single	adult female

Table 7.1. Descriptions of the MN Franchthi Cave burials.

These three individuals all face in a southerly direction. On the other hand, the remains on the Paralia, are placed on their right side in a flexed position. Both face a northerly direction. Only infants are found within the cave, and adults on the Paralia. A clear dichotomy in preparation and treatment of the body is apparent between the posture and orientation of neonates/infants and adults.

One individual in the cave was very disturbed and is quite unusual. This subadult female was found lying inside the cave on her front. Her arms were extended and the lower half of her body was missing. Also, rocks of various sizes covered the upper half of the body. Jacobsen and Cullen have suggested that this aberrant example of burial at Franchthi was the result of sacrifice, punishment by death, or deliberate disturbance by later occupants of the cave (Jacobsen and Cullen 1981:87). The disarticulated condition of the upper skeleton does suggest later disturbance, but random rock cover and absence of the lower half of the skeleton warrants further explanation. The other possibility not put forward by Jacobsen and Cullen, is that this skeleton does not represent a burial at all, rather it is a result of an accident. The skeleton was found near the breakdown at the entrance of the cave. It is possible that this individual was caught in the break down, and partially covered by the rock-fall. The absence of severe trauma to the upper part of the skeleton suggests she was not completely incapacitated by the event. But the study of the upper skeleton by Angel (1973:29) suggests that she often went without food for long periods of time. In a weakened condition, and without help, she would have eventually died. The lack of lower extremities may be a result of later carnivore activity.

2. Age and Sex Distribution

The MN sample at Franchthi is characterized by a lack of identifiable male remains. Two-thirds of the sample was female. The other remains were unidentifiable (Table 7.2). This does not presume that males are not present in the mortuary population. The sample is composed of a large number of non-adults (sub-adults, juveniles, infants, and neonates = 66.68% of the mortuary population). Adults make up only 33.33% of the mortuary population. These frequencies suggest a high child mortality rate in the population, but the small size of the sample precludes such general observations.

	Neonate	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	0	0	0	0	0.00%
Female	0	0	1	1	2	4	66.67%
Unidentified	1	1	0	0	0	2	33.33%
Total Count	1	1	1	1	2	6	
% of Total	16.67%	16.67%	16.67%	16.67%	33.33%		100.00%

Table 7.2. *The age and sex distribution of the MN Franchthi cave burials.*

3. Artifact Occurrence

The distribution of grave goods is disproportionate (Table 7.3). Only one adult, a female (Fr. 59), was given a large number of burial goods. She received the most burial goods (n=11; 78.57%), with six bone points, four obsidian points, and a monochrome Urfirnis vase. All of these items have a utilitarian function, and probably served to symbolically mark the woman's occupational skills. It is unlikely that these items, especially the obsidian, were any more than local sociotechnic symbols. The subadult female found in the cave appears to have been holding a rubbing stone and a bone point at the time of death (Cullen, personal communication). Since it is plausible that this individual's death was the result of an accident, I consider it unlikely that these items are burial gifts. The only infant or neonate to have received a material contribution to ritual is Fr. 48. This neonate received what must have been a highly valued marble bowl. Marble vessels are not particularly common in the Middle Neolithic, and it is significant that this vessel was found in the grave of a neonate and not an adult. This item may have acted as a local sociotechnic symbol, signifying a non-rank based status.

Fr #	Class	Type	Age-Sex	AGE	SEX
31	Stone	rubbing stone	subadult female	subadult	female
31	Bone	antler/horn cone?	subadult female	subadult	female
48	Stone	marble bowl	neonate	neonate	indeterminate
59	Bone	bone point	adult female	adult	female
59	Bone	bone point	adult female	adult	female
59	Bone	bone point	adult female	adult	female
59	Bone	bone point	adult female	adult	female
59	Bone	bone point	adult female	adult	female
59	Bone	bone point	adult female	adult	female
59	Stone	obsidian point	adult female	adult	female
59	Stone	obsidian point	adult female	adult	female
59	Stone	obsidian point	adult female	adult	female
59	Stone	obsidian point	adult female	adult	female
59	Pottery	monochrome Urfirnis	adult female	adult	female

Table 7.3. The distribution of burial furniture in the MN Franchthi burials.

4. Spatial Distribution

During the Middle Neolithic at Franchthi Cave, an obvious distinction is made in the spatial location of the burials (Table 7.4). In this phase, only infants and neonates were buried inside the cave. The main distinction between the neonate/infant and adult interments was their location. This is the opposite of the spatial relationship observed during the EN-MN transition phase at Franchthi Cave.

Distinctions made in the formal treatment and spatial location of the dead may also have some connection with the initial rites of passage in this society. The formal practice of exclusion implies that the infants and neonates did not live long enough to be formally acknowledged as members of the society. During this phase, the Paralia acted as the centre of social life for this small community. Burial inside the Cave may have acted to disconnect the dead with the community, while burial near the Paralia settlement served to acknowledge community members. However, without a larger sample suggestions such as these are very speculative.[1]

		Location		
Age-Sex	Data	Cave	Paralia	Grand Total
adult female	Frequency	0	2	2
	% Total	0.00%	40.00%	40.00%
infant	Frequency	1	0	1
	% Total	20.00%	0.00%	20.00%
neonate	Frequency	1	0	1
	% Total	20.00%	0.00%	20.00%
subadult female	Frequency	1	0	1
	% Total	20.00%	0.00%	20.00%
Total Frequency		3	2	5
Total % Total		60.00%	40.00%	100.00%

Table 7.4. The age and sex distribution by spatial location at Franchthi Cave.

5. Mortuary Differentiation and Social Distinctions

a) Normative Mortuary Treatment

The available evidence at Franchthi Cave suggests that normative mortuary treatment is characterized by single inhumation burials in pits (Table 7.5). Adults were placed in the grave on their right side in a flexed position, while non-adults (neonates and infants) were laid on either side in a semi-flexed position. The only exception to this normative treatment is the subadult female (Fr. 31) whose death may have been due to an accident.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Shape	indeterminate
	Avg. Volume (m^3)	indeterminate
	Floor	earth or bedrock floor
	Exterior	cap stones
	Formal Disposal Type	disposal area
	Special Features	two disposal areas
Preparation and Treatment	Age-Sex Categories	adult/subadult/infant/neonates only females
	Interment Type	inhumation
	Posture	Adults:right side; Non-adult:: either side
	Orientation	adult northerly; non-adults southerly
	PBA	adults flexed; infant/neonate semi-flexed
	Cultural Modification	none
Burial Scenario	Interment Form	single burial
	Ritual Process	primary burial
Burial Goods	Raw Material	bone
	Avg. #/interment	4.6
	Source	imported & local
	Distance	>500 km; <100km
	Manufacture	import finished/local
	Function	local sociotechnic

Table 7.5. *The normative mortuary treatment at MN Franchthi Cave.*

Overall, the burial scenario can be best described as a one-stage, or primary, burial process. There is no evidence to suggest a two-stage burial process. The burials are formally divided into two disposal areas: one on the Paralia, and one in the Cave based upon differences in age. Grave goods distribution is not related to age. They are were only given to an adult and a neonate. The adult female grave inclusions are composed of only utilitarian goods, while the neonate's grave good is a rare, valuable marble vase.

b) Social Distinctions

Five vectors of social distinctions can be identified at MN Franchthi Cave (Table 7.6). Only one vertical social distinction may be inferred at MN Franchthi. The unusual marble vessel buried with neonate Fr. 48, suggests that a valued item was purposefully accorded to this individual. It is unusual for a neonate to be given this type of grave good, mainly because it is a rare that valued items, or grave goods at all, are given to such young individuals. It is most likely, then, that the item symbolizes a high social status this individual might have attained, or was ascribed to. I tentatively suggest that this unusual case signifies that a hereditary social status was held by the neonate.

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation	Comments
Vertical Distinctions						
Hereditary Social Ascription??	1	Neonate			valued symbol	marble vessel
Horizontal Distinctions						
Occupational Membership	1	Adult	Female		gift assemblage	bone/stone tools pottery
Age Status	1	Adult				on paralia (beach-front)
	4	Infant/ Neonate	??	location of graves		in cave
Alternative Treatment						
Circumstances of Death	1	Subadult	Female	location, posture, and orientation of body		covered by cave-in debris

Table 7.6. The dimensions of social distinctions represented at MN Franchthi Cave.

Four vectors of horizontal social distinctions are visible in the MN mortuary activity at Franchthi (Table 7.6). Horizontal distinctions are apparent from differential formal treatment and spatial location. First, the placement of burials in the Cave or near the Paralia was made according to age. Second, the location and formal treatment of the adults also suggest symbolic recognition of community or social membership. On the other hand, infants and neonates appear to be excluded from social membership. The third social distinction is represented by the non-normative treatment of the subadult female. The deviant posture and condition of this young woman suggests that her death was a result of an accident, and was not affected by any customary or prohibitive directives of disposal. A fourth horizontal distinction is represented by the burial included with the adult female (Fr. 59). All of these items are tools to be used in the production of utilitarian technology. Each set of items, the bone points, the obsidian points, and the pottery may symbolize this woman's proficiency in each of the skills. These items, therefore, represented the occupational status the woman held within the community. It is unlikely that this goods had any symbolic significance or meaning outside the community, and the assemblage is sociotechnically local in nature.

Notes to Chapter 7

[1] The distribution of individuals in either the cave or the paralia is not significant (Fisher exact $p=0.142$). Therefore, it is possible that this is a random distribution.

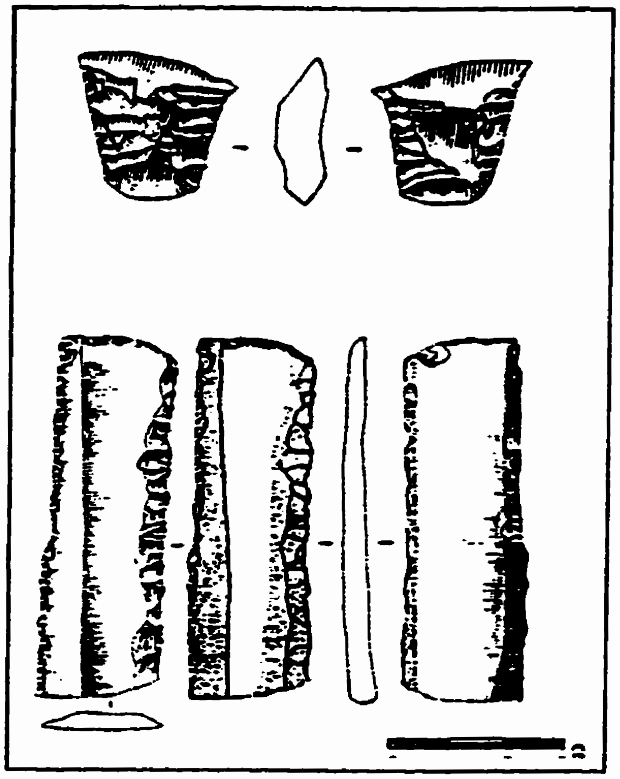


Illustration 7.1. Examples of Middle Neolithic chipped stone tools from Franchthi Cave (honey-flint). Source: Demoule and Perlès 1993:Fig. 6.

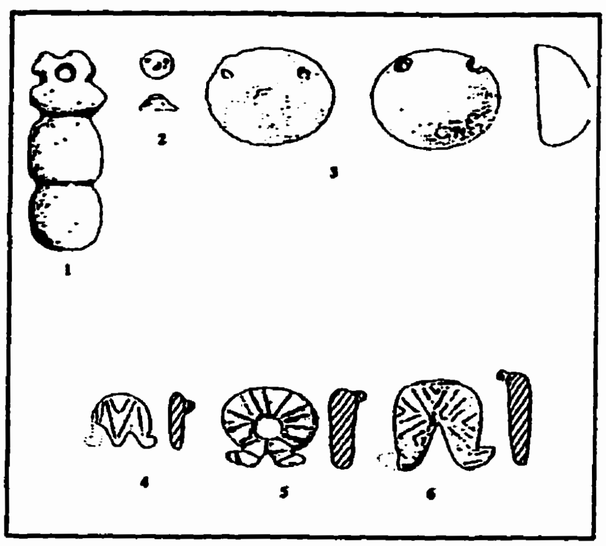


Illustration 7.2. Examples of Middle Neolithic ornaments. Achilleion: (1), alabaster (Gimbutas et al. 1989); Franchthi: (2-6), stone (Jacobsen 1976). Source Demoule and Perlès 1993:Fig.3.

CHAPTER 8

THE LATE NEOLITHIC

I. Introduction to Late Neolithic Material Culture

This phase in the Greek Neolithic covers approximately the next millennium, 5300-4500 B.C. Originally, this phase was thought to be much longer. In recent schemes (Coleman 1987; Sampson 1989; Zachos 1987) the Late Neolithic has been divided into two separate phases, the Late Neolithic and Final Neolithic. The Final Neolithic, also known as the Late Neolithic II, as originally conceived by Diamant (1974), Phelps (1975), and Renfrew (1972), corresponds to the Chalcolithic in the Balkans. The Late Neolithic is also sub-divided. Demoule and Perlès (1993:386-388) divide the LN I into two sub-phases: Phase 3 and Phase 4, each covering about a half a millennium. For this thesis, I follow the traditional phasing of the Final Neolithic, but for the Late Neolithic, Demoule and Perlès' Phase 3 and 4 are referred to as the Late Neolithic 1 and 2, respectively. This is done to provide consistency within the present work.

The Late Neolithic 1 (LN 1) sub-phase dates from about 5300-4800 B.C. Few radiocarbon dates or published sequences support this division, but various stylistic changes in pottery provide useful chronological indicators. In particular, the black burnished ware and the "matt-painted" ware (Weinberg 1970) best help define the LN 1 (e.g., Illus. 8.4). It is also at this time that the Cycladic islands, from Keos to Amorgos, are first inhabited. Known as the "Saliagos" group, these islands were inhabited on and off throughout the following Late Neolithic 2 (LN 2), and perhaps into the Final Neolithic (Demoule and Perlès 1993:388).

In contrast to the LN 1, the LN 2 is largely known through reference to stratigraphic and typological evidence, and reciprocal imports, which do not date to either the LN 1 or the Final Neolithic. This places the LN 2 to a brief time span, between 4800-4500 B.C. The LN 2 is most clearly identified in Greece north and east of the Pindus mountain range. Close similarities develop between the central area of Greek Macedonia and the Vinça province in the former Yugoslavia, Bulgaria and northeastern Greece (Thrace), and Albania and the "Classical" Dhimini culture in Thessaly. The picture is not so clear in southern Greece, but there are certainly distinct differences at this time in the assemblages between LN 1 or the Final Neolithic. In particular, there are certain groups of ceramics not identified with either of the earlier or later phases (Demoule and Perlès 1993; see Illus. 8.4 and 8.5).

A. Settlement Pattern

In general, the LN was a time of expansion of sites in northern Greece and the Aegean islands, pockmarked by occasional hiatuses at each site. Parts of Macedonia, Thrace, and the islands were now inhabited more permanently. Although these sites are large (50-100 ha in area), they are far less conspicuous than the immense tell-sites in Thessaly. In Thessaly, about half of the sites in the LN 1 are new. They did, however, shift from the hills to the alluvial plains beside older settlements (Demoule et al. 1988;

Gallis 1989; Halstead 1984). The sites are now more regularly spaced across the landscape, and numerous small settlements and "farmsteads" became common in the dry Larisa plain (Halstead 1989a). The changes in southern Greece are equally marked, but quite different from the north. Caves became increasingly occupied, and some older villages were abandoned. It is thought, however, that the actual number of sites did not decrease significantly (Diamant 1974; Phelps 1975, 1981-1982).

During the LN 2 settlement patterns continue to change, but are differentiated locally. In Thessaly, the new, smaller sites settled in the LN 1 were abandoned and the population aggregated in the larger settlements (Halstead 1984). At the same time, almost no new sites have been discovered for this sub-phase (Gallis 1989; Halstead 1984; 1989a). In the south, the major settlements in Boeotia were abandoned, and no new sites have yet been discovered through surface survey (Cherry 1990).

It has been suggested that these localized changes in settlement pattern reflect the first significant disparities in regional subsistence and economy. Some, such as Cauvin (1992), suggest that mobile pastoralism developed in southern Greece at this time, similar to the Near East. Van Andel and Runnels (1987) further suggest that there is a connection with the development of wool production and an increasing demand for sheep. However, the available faunal data (Halstead 1981;1984; 1989a; Boessneck 1955, Von den Driesch and Enderle 1976) do not suggest such a scenario. The "secondary products revolution," as proposed by Sherratt (1981, 1983) has not occurred yet. On the contrary, the evidence from Thrace (Sitagroi: Bökönyi 1986; Paradeisos: Larje 1987) and

Macedonia (Greenfield and Fowler, in preparation), where we would particularly expect to see this development, indicates that domesticated species were still being utilized for primary products. The secondary products revolution, and more mobile pastoral adaptations, characterizes the subsequent Bronze Age phase.

B. Settlement Architecture and Planning

Most of what is known of settlements during the Late Neolithic come from LN 2 Dhimini and Sesklo. These sites have various features in common with others during the LN. The ditches, circuit walls, and central buildings are the most significant. Only at Sesklo (Tsountas 1908; Theocharis 1968,1973) and Dhimini (Hourmouziadis 1979) are circuit walls known. These were built and rebuilt around a courtyard at the centre of the settlement (Illus. 8.1 and 8.2). Other settlements, such as Agia Sofia, Arapi, Souphli, Otzaki, Argissa, Servia, and Nea Nikomedia all have ditches during the LN phase. These sites are located on alluvial plains with little available stone, and the walls may have served the same function (defence?) as the circuit walls (Demoule and Perlès 1993:390). The ditches are paralleled in Balkan settlements to the north during this period (Vinça A to C).

The other significant architectural feature of the large LN settlements is the central building, perhaps incorrectly termed the "megaron" (Darque 1990). The *megara* all have their basic shape (Illus. 8.3), large size, and location in common.[1] They were placed in the centre of the village and had access constricted by either a ditch or circuit walls. The size and central location of these structures is proposed as some of the best supporting evidence for the emergence status differences within the communities (Demoule and

Perlès 1993:391). However, they may have had other functions, as well (ceremonial, communal, etc.).

C. Technology and Crafts

1. Domestic Equipment

During the Late Neolithic, evidence for three new general features characterize the common domestic equipment. Storage jars, such as pithoi, and domed ovens are now regular domestic features. The use of stools and armchairs has been implied from the seated figures (Demoule and Perlès 1993:391). The use of large, flat hearths continue. They are know from earlier periods and are still the focus of domestic activities. From the evidence at Dhimini, the ovens and hearths seem to be primarily used for cooking, but kilns have also been identified (Hourmouziadis 1977). Querns, grinding stones, and flaked tools compose the domestic stone tool-kit, and red deer antlers become more common in the LN bone kit (Moudrea-Agrafioti 1987). A wider range of pots (see below) continue to be the major class of domestic equipment.

Throughout the LN, there is more evidence for a wider range of weaving equipment and weaving techniques. Spindle whorls, clay and stone spools, and loom weights are far more common compared to previous phases (Demoule and Perlès 1993:391). From impressions on pots and house floors, we find plain weaves and simple swill techniques to make mats and baskets (Renfrew 1973). There are also a few cases of mats made with a coiling technique rather than by weaving (Evans and Renfrew 1968). It may also be that fur rugs were being used on the floors of some houses at this time.

Particularly at Dhimini and Pevkakia, bear carpal bones have been discovered, leading both Halstead (1984) and Hinz (1979) to conclude that the skins were used with the paws still attached. It could be a question of debate, though, whether these represent rugs or blankets, as their context within the household reveals little about their actual function.[2]

2. Ceramic Production

The LN shows severe changes in the styles of ceramics. These are brought about largely by new innovations. Complex decoration is characteristic of this long phase, and painting often covers the entire vessel both inside and out. Never before has the density of decoration, as well as the intricacy and precision of the craft, been so well expressed (Otto 1985; Washburn 1983).

Particular to this phase are the larger vessels, such as pithoi (Illus. 8.4 and 8.5). These are similar to the MN Franchthi vessels in size, and would have been made using much the same methods (Vitelli 1993). The most common types of ceramics are still bowls, although there are now greater variety (shallow, flat-based, open straight-sided, carinated). Jugs, jars with open handles, and stands are now regularly part of production (Hauptmann 1981; Hauptmann and Milojcic 1969; Theochares 1973; Wace and Thompson 1912).

The innovations in decoration show that more time was spent on the development of unique and fine styles of pottery, perhaps showing that potting had become a specialized craft (Demoule and Perlès 1993:392). Styles, such as the black Larisa ware (LN 1), are unprecedented in the polishing and ripple effect given to vessels. The

Polychrome (LN 1, LN 2) wares of central Greece and Thessaly were made possible by the use of new maganese and graphite pigments (Demoule and Perlès 1993:392). These new wares were made available by the more sophisticated use of kilns and saggars (Renfrew 1973; Vitelli 1991), which allowed for the three stage firing process needed for making polychrome wares. This firing process was, however, unnecessary for making the black-on-light wares using iron oxides (Frierman 1969; Jones 1986). Therefore, it seems to have been an innovation geared solely towards the production of an original local style.

In the LN 1, two interaction spheres for the distribution of ceramics have been noted (Demoule and Perlès 1993:392). First, the most common pottery found during this time are the black-burnished and matt-painted wares. These are found throughout the mainland. On the other hand, certain specific styles had quite a limited distribution, such as the red burnished, black-and-white, and Arapi polychrome wares. Some styles were confined to Thessaly alone, while others were regional or local (Halstead 1984; Rondiri 1985; see Illus. 8.4).

During the LN 2, the situation is quite different (Illus. 8.5). During this phase, specific forms of pottery were only used at certain sites. A good example is the "Classical Dhimini" ware (Wace and Thompson 1912). Through chemical analyses, it has been found that certain types of local clays permitted the making of only certain styles. These styles were produced, it seems, with only specific functions in mind. For example, the grey-on-grey ware was largely confined to graves at Plateia Magoula Zarkou (Demoule et. al. 1988), and the Larisa black ware was deposited in pits with only wild, and not domesticated animals (Watson in Halstead 1984). Therefore, this sub-phase represents a new diversification in production techniques. The purpose of these techniques appears to be focused on producing a diverse group of pottery for an equally wide range of functions.

3. Flaked Stone Production

In the LN two different patterns of flaked stone production appear for northern and southern Greece. The primary difference is in the procurement of raw materials and the production of specialized tools (Illus. 8.6). In the south at this time there is a great increase in the amount of obsidian used. At the same time there is a considerable decrease in the use of local raw materials, such as jasper and black flint. The increase in "exotic" materials is perhaps due to the simultaneous colonization of the Cyclades at this time (Cherry 1981; 1990), which could have put more obsidian in circulation. Flint and jasper were no longer used for simple utilitarian tools in the south. Fine arrowheads were being made of these materials by indirect percussion using plain butts in the LN 1, and platform preparation using faceted butts by the LN 2. It is also noteworthy that very few sickle blades have been found during the LN in the south. This has led some to suggest that pastoral agriculture came to dominate subsistence activities (Demoule and Perlès 1993:394).

In the north, different strategies are being adopted and old strategies continue. The dominant use of local raw materials continues, including the wide use of flint and jasper tools formed by pressure flaking. Obsidian is still imported as preformed or flaked cores. The striking feature in the north is the almost complete lack of any new, specialized, refined stone tools, as compared to earlier phases. As well, it is only by the LN 2 that sickle blades become less common, and this phenomenon is confined to Thessaly alone.

4. The First Metal Objects

There has been much ado about the initial appearance of metal artifacts in Greece. Authors such as Renfrew (1972) have seen it as a pivotal technology in the formation of Greek civilization, while others want to view these scarce finds in a less grandiose context. A review of Renfrew's (1973) and Gimbutas' (1989) data reveals an incredible scarcity of metal finds in LN Greece. The only object dating to the LN 1 phase, is a small copper head from Dikili Tash (Séfériadès 1992). Although copper extraction is very common in the LN 2 at Aï Bunar in Bulgaria and throughout the Balkans (Eastern European Late Neolithic, 4800-4500 B.C. [Demoule and Perlès 1993:395]), there are only some twelve metal artifacts positively dated the LN 2 period (Dikili Tash, 9 copper pins; Paradeisos, 2 copper pins, Kitsos 1 copper pin).[3] The rarity and condition of these objects imply that they were traded as finished products and not as raw materials (Demoule and Perlès 1993:395). The social implications of acquiring these rare objects has yet to be fully explored.

D. Trade and Exchange

Including the metal objects, three classes of artifacts were exchanged during the Late Neolithic phase, although the rate of exchange and their distribution differed. The utilitarian tools of the LN (ceramics, obsidian, flint and jasper, celts, grinding tools) mainly circulated between neighboring communities (especially ceramics, Schneider et al. 1991). Melian obsidian, however, now reached Macedonia (Servia: Ridley and Wardle 1979; the Ptolemais basin: Fotiadis 1987, 1988; Demoule and Perlès 1993:395; Nea Nikomedia: Rodden 1962, 1964), and Thessaly in small quantities. Demoule and Perlès (1993:396) have noted that trade in Melian obsidian in north Greece conforms to Renfrew's (1984) hypothesis that trade by middlemen is culturally bounded. The frequencies of obsidian from the source (Melos) show that over 80% of the total obsidian comes from sites closest to Melos, while a sharp boundary is notable as one moves into eastern Macedonia. However, it is among the "rare goods" that the most significant changes in trade appear. Shell bracelets of spondylus (*Spondylus gaedoporus*) are now more common (Renfrew 1973) and were made at coastal sites and traded inland (Hourmouziadis 1979, Renfrew 1973; Runnels 1983; Shackleton 1988; Tsuneki 1989). Stone vases, rare marble figurines, celts, and grinding tools also became more abundant, but exchange seems to have been made in progressively smaller areas (as with ceramics; Demoule and Perlès 1993:395-396).

Overall, during the LN period the differences between northern and southern Greece become more pronounced. Increased population density and peculiar distributions of artifacts throughout settlements characterize the north, while no population increase and a specific localism in pottery styles define the south.

II. Analysis of LN Mortuary Remains

A. Diros: the Aleopotrypa Cave

1. Introduction to the Site

The Aleopotrypa Cave is located about 2 km to the south of the current village of Diros, in the district of Mani. Excavations in the cave were conducted by G. A. Papathanasopoulos from 1970 to 1971 (Papathanasopoulos 1971 1972, 1981; Lambert 1972b). The excavations revealed that certain parts of the cave were used as habitation areas (Illus. 8.7: Θ12, Θ13, Θ14). Two "rooms" in the southeast section of the cave contained disc-shaped ovens for baking bread, hearths, and utilitarian pottery (Papathanasopoulos 1971). The material recovered from the cave dates to the Late Neolithic phase.

The burials cover a large area deep within northeast corner of the cave (Illus. 8.8, Θ9 and Θ10). In antiquity, and more recently, several sections of the cave collapsed. One of the areas that suffered damage during the shifting of the cave was the disposal area. As a result, the skeletal remains have been disturbed from their original locations.

The disturbed and scattered condition of the skeletal remains has resulted in several assumptions regarding the mortuary ritual at Aleopotrypa cave. First, the disposal area in the cave has been regarded as an ossuary by both Papathanasopoulos and Lambert. Essentially, this means that formal graves, such as a pit, were not used to house the remains of the dead. Second, the disturbed condition of the skeletal remains has both Papathanasopoulos and Lambert to suggest that secondary burial was the practice at

Aleopotrypa. In light of these assumptions, I will review these previous analyses of the skeletal data.

2. Formal Treatment

Most of the skeletal remains in the Aleopotrypa cave are located under a low overhanging rock ledge that runs from Θ10, northeast into Θ9. The collapse of this ledge has covered many of the skeletons with rocks and boulders of various sizes. It has also affected the original location of the skeletons (e.g. Illus. 8.9). Upon excavation, the bone elements of many individuals were found mixed together in a large mound.

The skeletal sample consists of only 58 different cranial and post-cranial bones. However, the state of preservation of the sample is quite remarkable. For the most part, cranial elements are represented by complete, or almost complete, skulls. There are also several isolated cranial elements, such parietals, mandibles, and maxillae, that were recovered. A study of the cranial elements suggests that a minimum of 14 individuals were buried in this section of the cave.

Most of the post-cranial elements do not appear in the frequencies that one would expect, given the number of individuals estimated from the cranial remains (Table 8.1). Although, the post-cranial bone elements compose over 72.4% of the overall skeletal sample, the frequencies of long bones, phalanges, carpals, and other small compact bones, are quite low. There are two possible reasons for this. First, the small, compact bones may have not been recovered during excavation. This is common if sieves were not used, and neither Lambert nor Papathanasopoulos mention using sieving techniques. The other option is that the bones were lost as a result of secondary burial practices.

Format	Bone Element	Frequency	% of Total
Cranial	Cranium	4	6.90%
	Cranium & Mandible	8	13.79%
	Parietal	1	1.72%
	Parietal & Mandible	1	1.72%
	Mandible	1	1.72%
	Maxillary	1	1.72%
Sub-total		16	27.59%
Post-cranial	Vertebrae, Lumbar	2	3.45%
	Vertebrae	5	8.62%
	Humerus	3	5.17%
	Radius	1	1.72%
	Pelvis	4	6.90%
	Sacrum 1	1	1.72%
	Femur	6	10.34%
	Tibia	3	5.17%
	Carpal	2	3.45%
	Cuneiform	1	1.72%
	Metatarsal	5	8.62%
	Cuboid	3	5.17%
	Calcaneum	4	6.90%
	Tarsals	1	1.72%
	Fragment	1	1.72%
Sub-total		42	72.41%
Total		58	100.00%

***Table 8.1.** The frequency of skeletal elements in the Aleopotrypa Cave.*

An equal number of individuals were recovered from areas Θ9 and Θ10. In area Θ9, seven individuals are represented in three different locations. In Θ9e, four individuals were identified by entire or partial skulls. One person was of adult age, but the ages of the other three were not determinable. As well, a variety of post-cranial bone elements and fragments of pottery were found scattered about the area. In area Θ9f, two further individual skulls were recovered. The skulls were accompanied by the damaged remains of a pubis and tibia, many broken pieces of pottery, and a groundstone. In this area, both persons were of adult age. In area Θ9g, one adult was identified by a complementary cranium and mandible. A large hole is apparent in the frontal bone of the skull, and death may not have come as a result of natural causes. Few post-cranial elements were otherwise identified in this area, and all may belong to this adult. Near this adult were the remains of broken pottery and a stone tool, which may have been used in food processing (a pounder).

In area Θ10, only sections Θ10d, Θ10e, and Θ10c held any human skeletal remains. In Θ10c, a variety of post-cranial bone elements (mainly foot bones) were recovered. The only outstanding find is the fragmented pelvis of an infant. This is the only other individual represented in area Θ10 that was not identified in Lambert (1971b). In 10e, the femur of an adult, and several vertebrae also of adult age were recovered. It is in the region of Θ10d were the 7 individuals in Θ10 were identified. The remains of seven skulls, several with associated mandibles, were identified to two adults, three juveniles, and two individuals of indeterminate age. In Θ10dIII and Θ10dIV, a large amount of broken pottery and a large number of stone tools were found. The other unique feature about this group is that a row of stones was laid out in a circle around them (Lambert 1972b; cf. Jacobsen and Cullen 1981:91). Perhaps it is this group that can best yield some insight into the mortuary ritual at Aleopotrypa.

3. Age and Sex Structure

The age and sex structure of the mortuary population suggests a normative distribution. The distribution is characterized by a high proportion of adults (54.55%), with lower frequencies of sub-adults (9.09%), juveniles (27.27%), and infants (9.09%).

The distribution suggests a low infant mortality rate, but somewhat higher juvenile mortality rate. A preference for the burial of adults in this disposal area can also be implied.

4. Artifact Occurrence

Pottery and stone tools were abundant in this area, but it is unlikely that these were utilized in a social differentiating capacity. The items may have served as burial goods, but most certainly had a function in the mortuary ritual as whole. In general, the artifacts in the disposal are cannot be assigned to particular individuals, or groups of individuals. This has disallowed any discussion of the spatial relationships of burial goods in the disposal area.

5. Mortuary Differentiation

The formal treatment of the dead in Aleopotrypa cave is suggested only by one, comparatively, undisturbed section of the disposal area. The area of TΘ10d, squares III (Illus. 8.9) and IV (Illus. 8.10), hold the best examples of interment which can be used to infer the program of disposal acting at this site. In this small area, the skeletal remains were not found in such a haphazard condition. For Aleopotrypa Cave, there are several pieces of evidence that suggests the dead were ascribed a formal mortuary ritual, even though features such as formal burial facilities are not present (or not detectable?).

First, the disposal area was spatially distinct from the habitation areas in the southern side of the cave. This may have been for practical purposes, but this practice is similar to other caves used as disposal areas during the LN phase. For example, at Kitsos

Cave (cf. below), the disposal area of the dead and the habitation area were both in the cave. At Aleopotrypa, the inhabitants of the cave buried their dead in the cave and also occupied it at the same time. This is best shown by the permanent cooking facilities in the southern rooms of the cave. Second, the bounding of a group of individuals suggests that formal distinctions were made in the disposal area. However, further evidence of this practice has been obscured by the destruction of the disposal area.

a) Normative Treatment

Overall, social distinctions were not discernible in the mortuary activity at Aleopotrypa Cave (Table 8.2). Despite the lack of information relevant to the mortuary ritual at Aleopotrypa, it is nevertheless possible to suggest several features of the normative treatment of the dead.

Papathanasopoulos and Lambert have suggested the disposal area in the cave may be an ossuary. There is, however, evidence that contradicts this opinion. First, the group of individuals in area Θ10dIII (Illus. 8.9) and Θ10dIV (Illus. 8.10) were set apart from the others by a stone outline. It may be that other groups were once differentiated by the same method, but this is impossible to determine given the state of the remains. Nevertheless, one scenario is likely: all the individuals who died while the cave was occupied were buried in a marked area. When the group reoccupied the cave at a later time, these burials were cleared away, and the remains were deposited farther back in the cave. A similar process of disposal and clearing is found at other LN cave sites (e.g., Kitsos Cave, below), and in the following Bronze Age. Second, an adult was found isolated in Θ9g, located far back into the cave. The head wound (Illus. 8.11) and the location of the body suggest that differential treatment was given this person. This alternative treatment may be due to the circumstances surrounding their death, regardless whether the wound was a result of punishment or foul play.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	covering stones?
	Shape	none
	Avg. Volume (m^3)	none
	Floor	cave floor
	Formal Disposal Type	disposal area
	Special Features	bounded groups
Preparation and Treatment	Age-Sex Categories	normative distribution
	Interment Type	inhumation
	Posture	disturbed
	Orientation	disturbed
	PBA	disturbed
	Cultural Modification	none
Burial Scenario	Interment Form	primary?
	Ritual Process	?
Burial Goods	Raw Material	pottery/stone tools
	Avg. #/Interment	?
	Source	?
	Distance	?
	Manufacture	?
	Function	technomic

Table 8.2. *The normative mortuary treatment represented by the burials in Aleopotrypa Cave.*

Therefore, the burial scenario at Aleopotrypa cannot be defined by secondary burial. Nor can it be argued that the mandibles of the skull were purposefully removed (Papathanasopoulos 1971; Lambert 1971b; cf. Jacobsen and Cullen 1981:91). I argue that the highly disturbed nature of this disposal area impedes such conclusion. In order for burials to be defined as secondary, it must be established that some primary treatment was accorded the dead before final interment. The treatment of the dead at Aleopotrypa do not directly suggest this by the evidence of bone pathology, weathering, or other modifications. Further, if a cemetery is defined as "an area appropriate for the disposal of the dead over a span of time extending beyond the moment," as Schulting (1996) suggests, than it becomes less likely that the burials at Aleopotrypa form an ossuary. I would prefer to define these burials as belonging to an area of the cave used exclusively for the disposal of the dead.

B. Plateia Magoula Zarkou

1. Introduction to the Site

In the spring of 1974, a salvage excavation team headed by Christos Gallis made trial excavations at Plateia Magoula Zarkou and Souphli Magoula (Gallis 1975; 1979; 1982). Plateia Magoula Zarkou is located about 30 km west of Larisa. The site is a large *magoula*, or hill, about 200 m in diameter and 4 to 5 m high. The Neolithic finds at Plateia Magoula Zarkou are confined to the Late Neolithic 1 sub-phase. The presence of black-burnished Larisa ware is the best chronological indicator of this time period at Zarkou (LN 1; Illus. 8.5, no. 10).

The prehistoric settlement at Zarkou has been known for quite some time (Gallis 1979:226). However, only with the opening of an irrigation ditch in the area in 1974, were burials recognized at the site. At spots along the irrigation ditch and to the northeast, 67 burial urns containing the cremated bones of as many individuals were discovered (Gallis 1979:69). These finds prove to be the only well-known evidence of an "urnfield," or cremation cemetery during the Late Neolithic.

Although the sample from Zarkou is adequate for this analysis, certain difficulties arose during excavation which affected the quality of some finds. The cemetery is located next to a field, and both modern and prehistoric ploughing have damaged Neolithic deposits. Further, excavation of the irrigation ditch with a bulldozer (Gallis 1982:227 n. 5) resulted in the loss of numerous other urn burials. This situation mainly affected the 1974 investigation. Later excavation proceeded northeast and east of the irrigation ditch. However, the abundance of high quality data from this cemetery far outweighs the few destroyed examples.

2. Formal Treatment

a) The Mortuary Facility

The facilities used to house the cremated remains at Zarkou are thought, in all cases, to be simple pits (Appendix Table 8.1). The precise dimensions and shape of every pit was not recovered. This is mainly because of erosion and the fact that many burials were found within or along the walls of the irrigation ditch (Illus. 8.12). However, estimates put forward by Gallis (1979; 1982) suggest there were few differences in either the size or shape of the pits. According to Gallis, all graves are thought to be circular pits, roughly 0.7 m in length, width and depth.

As to be expected with cremation burials, the small size of the graves reflects the directives of the disposal program. The cubic volume of each grave is approximately 0.269 m^3. This suggests that it would have taken less than two hours to excavate the burial facility. There is no indication that the graves were constructed with anything in mind except what was essential: a cavity to house the burial urn and the accompanying burial gifts. That is, at Zarkou there is no indication of any elaboration to the burial pits that would have facilitated a great amount of energy expenditure.

b) Pre-interment Treatment

Even though a great variety of human bone elements are represented in the cemetery (Appendix Table 8.2), cranial elements and a variety of fragmentary post-cranial elements dominate the skeletal remains. In certain cases, isolated vertebra, ribs, and scapula were identified (Xirotiris in Gallis 1982:Appendix A). As well, in three cases (T2, T6, T15), animal bones were found in the pit. No faunal remains were found within the burial urns.

Most bones showed a grey surface color (47%) or a combination of white-brown (39%). Several burials also had bones with white, grey-white, or white-grey-brown surfaces. Based upon the experimental data of Buikstra and Swegle (1989:255-256), the pre-condition of the bones, the degree of incineration, and the time it would have taken to bring the bones to such a state, can be inferred.

White-brown and white-grey-brown coloring suggests that the bone was in a dry condition before being cremated. A large percentage of the skeletal remains reflect this particular condition (42% of burials). "Dry" bones are those where the flesh is removed some time before cremation. Bones that underwent this procedure show a characteristic brown or tan color after they are burnt. As well, these bones are highly calcined, exhibiting a great degree of incineration. The amount of time it would have taken to bring these bones to this state is estimated to be between 60-70 minutes (Buikstra and Swegle 1989).

Other burials had bones exhibiting only a grey surface color (48%). These bones were not calcined, and show a low degree of incineration. On a hot wood fire, it would have taken as short as 7-12 minutes to achieve this state of burning (Buikstra and Swegle 1989). It is possible, due to the low degree of incineration and short burning time, that these bones may also have been dry before being cremated. The reason a dry pre-condition is proposed here, lies mainly in the lack of either whiteish or blueish color. These colors characterize bones that are burnt either fleshed or with the flesh removed immediately before cremation (i.e., "fleshed" and "green"). In these cases, the bones would only have been "smoked," but to such a degree that the naturally white surface was not outwardly visible.

The remaining burials (n=7; 10%) had bones that were either white or white-grey in color. Little can be determined about bones that are only white in color (n=6). These bones were both partially smoked and partially calcined, suggesting it could have taken anywhere from 7-70 minutes to achieve this state of burning (Buikstra and Swegle 1989). The pre-condition of the bones in these six cases is largely indeterminable, and they could have been fleshed, green, dry, or any combination of the three, before being cremated.

A single burial had bones with a grey-white surface. In this burial (T18), a wide variety of cranial and post-cranial bone elements are present. These bones were also partially smoked and calcined, and may have taken from 7-70 minutes to get to this condition (Buikstra and Swegle 1989). However, the combination of only a grey-white coloring eliminates the possibility of the bones having been burned in a dry condition. Only bones that were burnt fleshed, partially fleshed, or green have surfaces limited to a white-grey coloring.

The pre-cremation modification to the bones is, then, limited to two types. Either the bones were defleshed to a variety of grades before they were burnt, or they were not modified (i.e., not defleshed). In the terms described above, it is probable that 48% of the bones were defleshed, while at least 42% were positively defleshed. A small proportion of the cremated remains may not have been modified in any way (9%). Based upon the case of burial T18, I suggest that the body of this individual may not have been modified to the same degree as the others, if at all, before cremation.

The practices of bone modification due to burning allow a sketch of the treatment program to be drawn. Those individuals that show evidence of defleshing would have been cremated in a disarticulated condition. This would allow, as the coloring and degree of incineration shows, the bones to have been completely calcined. Most of the individuals in this mortuary population seemed to have undergone this procedure (55%). On the other hand, the precise treatment of many individuals was indeterminable (43%). In the published report, most remains could not be classified according to pre-cremation condition (Xirotiris 1982). Only one individual (T18) appears to have had bones burnt while articulated (T18). With this case, some of the bones may have not been completely fleshed. This would have allowed the bones to be smoked, consequently turning them grey in color.

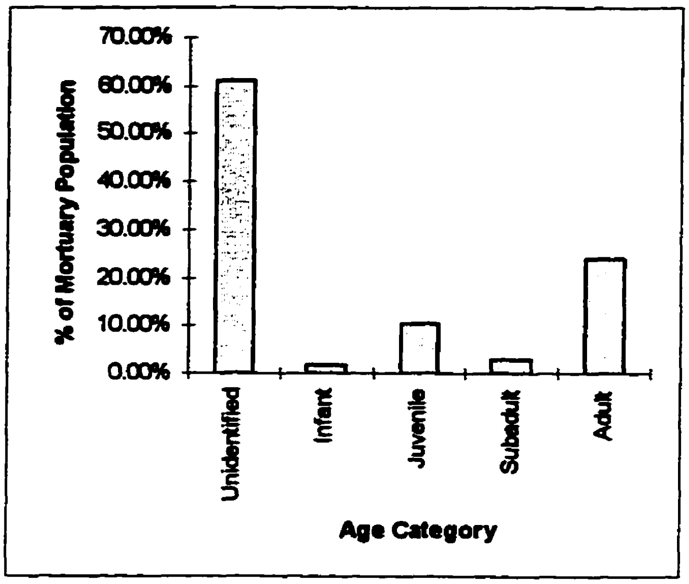
The low frequencies of many cranial and smaller post-cranial bones in the sample shows that only a select number and type of bones were placed in the burial urn. These are not the same in every case. Only in 10% (n=7/67) of the cases were a large number of bone elements found, although all in a very fragmented condition. Only certain portions of the body were selected for cremation. In only one case (T18) was most of the skeleton recovered (1.5%). In this case, it is possible that the skeleton was burned as a partially fleshed skeleton. Based upon these observations, the dead at Zarkou were prepared in two ways: 1) either the body was allowed to decompose, and then certain bone elements were selected for cremation; or 2) the body was defleshed and disarticulated, then placed as a bundle upon a pyre for cremation. Either of these scenarios would yield the patterns observed for the burnt remains at Zarkou.

3. Age and Sex Distribution

With cremated skeletal remains it is often exceedingly difficult to assign both age and sex to isolated individuals. Both the fragmentation of the remains and the distortion of key surface features play a role in making identification difficult. With these limits in mind, the remains at Zarkou were mainly identified to age classes (Xirotiris 1989).

In total, 67 individuals were identified at Zarkou (Fig 8.1). A large number of the remains were not identified to either an age or sex class (61.19%). Only in two cases (3%) were individuals identified roughly to a sex class. Both of these individuals were identified as adult males. Only 38.81% of the sample was identified to an age class. With the identified individuals, adults dominate (61.54%) over sub-adults (7.69%), juveniles

(26.92%), and the single infant (3.85%). From the classified material, the ratio of adults/subadults:juveniles/infants stands at roughly 2:1.



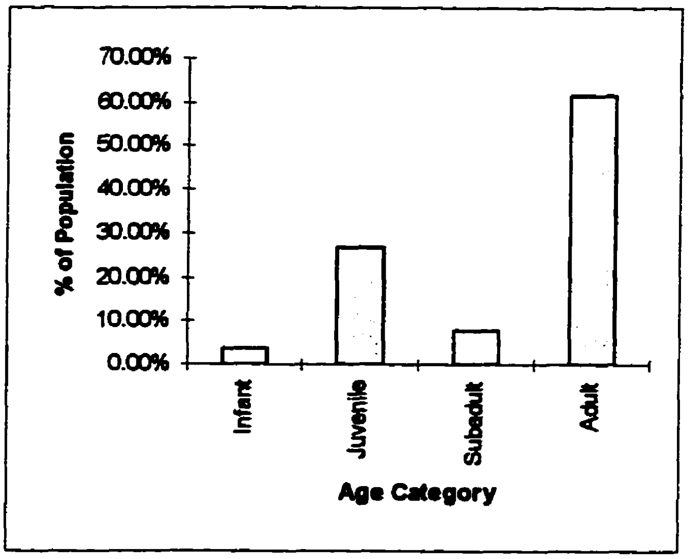


Figure 8.1. Upper: *Distribution of all age categories at Zarkou.* Lower: *Age distribution of identifiable individuals at Zarkou.*

This distribution is the result of cultural and attritional factors. Even though the practice of cremation can be viewed as a cultural selection, the process of burning still acts as a attritional factor. As a result, these numbers hardly stand as a normative age-sex distribution. Nevertheless, because almost 40% of the remains could be identified, it is still possible to attempt an identification of general patterns of age-based constraint.

There appears to be no apparent constraint on either age or sex in terms of pre-interment treatment. The only exceptions are with a juvenile, and several adult and undifferentiated remains (n=4). These are the individuals that may have not undergone any modification to the corpse before cremation. In general, the pre-interment treatment of the dead according to age and sex appears fairly homogenous, with no outstanding constraints on mortuary treatment according age being represented.

4. Artifact Occurrence

In comparison to the other Neolithic cemeteries, there is a high frequency of burial furniture present in the Zarkou cemetery (n=99). Two principle types of burial furniture are found in the Zarkou cemetery. The first class is the burial urns. These acted as the containers for the cremated remains of the dead. The second general class is burial gifts. The gifts are found both within and beside the burial urn.

In all, there are ten types of burial furniture used at Zarkou, ranging from large amphora to figurines (Table 8.3). The major types can be divided into seven sub-types (based upon decoration and style). Most vessels were undecorated, but there is single example of a zoomorphic vase. Vessels were found with or without handles, and most of the smaller, closed vessels had either a bell-shaped, conical, or bi-conical body shape.

Primary Type	Sub-Types						
	undecorated	handled	handleless	bell-shaped	conical	biconical	zoomorphic
amphora	X	X	X	X		X	
bowl	X		X	X		X	
cup		X	X	X			
jar		X		X			X
pithos			X				
skyphos			X				
dish	X						
indeterminate urn	X						
indeterminate vessel		X			X		
sherd(s)	X						
figurine	X						

Table 8.3. *The principle types and styles of burial furniture represented at Zarkou.*

Burial urns are limited to seven types (Table 8.4). Several urns were recovered in a shattered condition, leaving them unclassifiable. The most common type is the amphora (21%). Amphorae are seldom decorated and were found with or without handles. There are also a few examples of bell-shaped, conical, and bi-conical shapes (Illus. 8.13). Bowls, cups, jars, a *pithos*, and several *skyphos* vases are represented among the types of burial urns (Illus. 8.14 and 8.15). One type, a zoomorphic jar, is a rare singular occurrence (Illus. 8.16).

Primary Type	Sub-Types						
	undecorated	handled	handleless	bell-shaped	conical	biconical	zoomorphic
amphora	X	X	X	X		X	
bowl	X					X	
cup		X	X	X			
jar		X		X			X
pithos			X				
skyphos			X				
indeterminate urn	X						
indeterminate vessel		X					

Table 8.4. *The types and styles of burial urns represented at Zarkou.*

Most burial urns were grey in color (37%). Several vases were also red (10%) or orange (3%), and there are 11 urns of black "Larisa ware." Most of the urns were found disturbed from their original location. However, several were found *in situ*. Most of these vessels were found oriented in an upright position (51%). Slightly fewer vessels were found inverted (40%), and the remaining urns were found fragmented or destroyed to a greater or lesser degree (9%).

Primary Type	Sub-Types						
	undecorated	handled	handleless	bell-shaped	conical	biconical	zoomorphic
amphora	X			X			
bowl	X		X				
cup		X	X	X			
jar				X			
skyphos	X						
dish	X						
indeterminate vessel					X		
sherd(s)	X						
figurine	X						

Table 8.5. *The types and styles of burial goods represented at Zarkou.*

There is a somewhat wider range of types of burial gifts at Zarkou (Table 8.5). The gifts are almost exclusively pottery (94%), but there are two examples of terracotta figures (6%). Amphorae, cups, and single sherds are the most frequent types of burial gifts. Unlike the burial urns, many of the burial gifts are brightly colored. Red is the most common color (42%). Only certain amphorae and single sherds were red. The single red sherds were placed beside or in the burial urn. Gifts are also made with a grey colored clay. There are smaller frequencies of orange-colored pottery and black Larisa ware in the burial gift assemblage.

a) Artifact Associations

The distribution of the burial furniture throughout the cemetery shows a pattern of disparity (Fig. 8.2). Most individuals received one piece of burial furniture, this being the burial urn they were interred in. However, in several other cases, individuals were buried with at least two or more artifacts. Only about 35% of those buried at Zarkou received artifacts not directly related to disposal of the body.

From the available data, constraint can be observed according to age. Four types of burial gifts are exclusive to adults: amphorae, the bell-shaped jar, skyphos, and the dish. These types are not found with the juveniles or sub-adults, and were otherwise found along with the remains of undifferentiated individuals. It is then probable that these individuals are of adult age. Other types, such as single-handled amphora, conical vases, and bell-shaped cups, are found only with juveniles. The other burial gifts run across more than one age category: handleless cups are found with both adults and juveniles; and single red sherds are found with all ages.

b) Frequency-Distribution of Artifacts

The frequency-distribution of burial goods at Zarkou conforms to a hierarchical distribution (Fig. 8.2). A Pareto algorithm was applied to this distribution in order to achieving a smoothing of the frequencies (i.e. provides a sorted histogram). A significant break in the distribution comes after the presence of one gift. Only five individuals received two gifts, one received three gifts, and one individual received four gifts. From this analysis, five raw levels of "wealth" are exhibited by the Zarkou burial gift distribution.

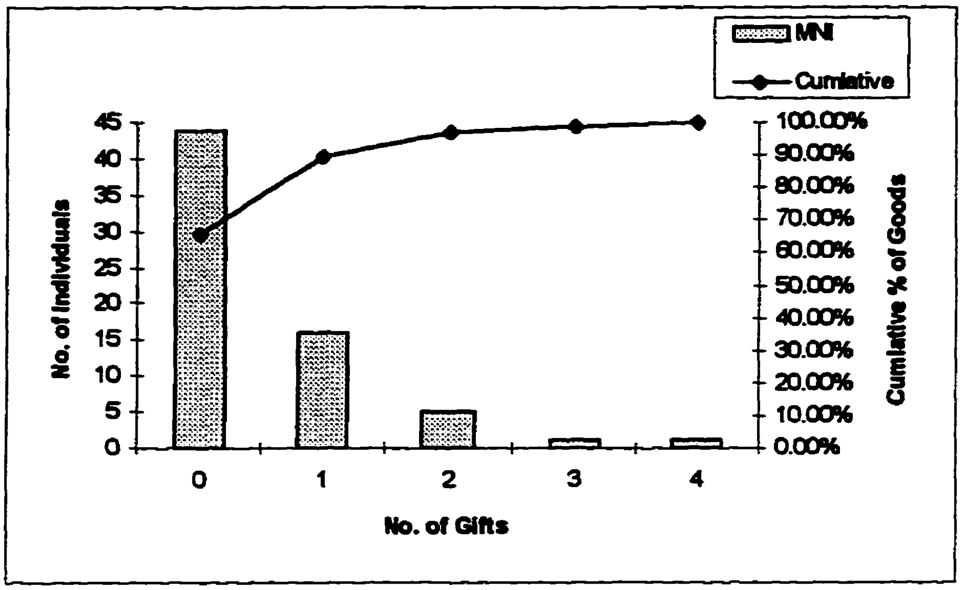


Figure 8.2. Frequency-distribution of artifacts in the Zarkou cemetery.

As described in Orton and Hodson (1981), the Pareto algorithm allows individuals to be assigned to "states of wealth." This analysis suggests there are four states at Zarkou. The lowest state is characterized by 0 gifts; the second by 1 gift; the third by 2 gifts, and the upper level by 3-4 gifts. If wealth distribution is consistent with social position, then four distinct social rank levels are represented at Zarkou (Fig. 8.3). The frequency-distribution allows a null-hypothesis to be put forward: that a minimum of four hierarchical rank levels could be represented by the mortuary treatment at Zarkou.

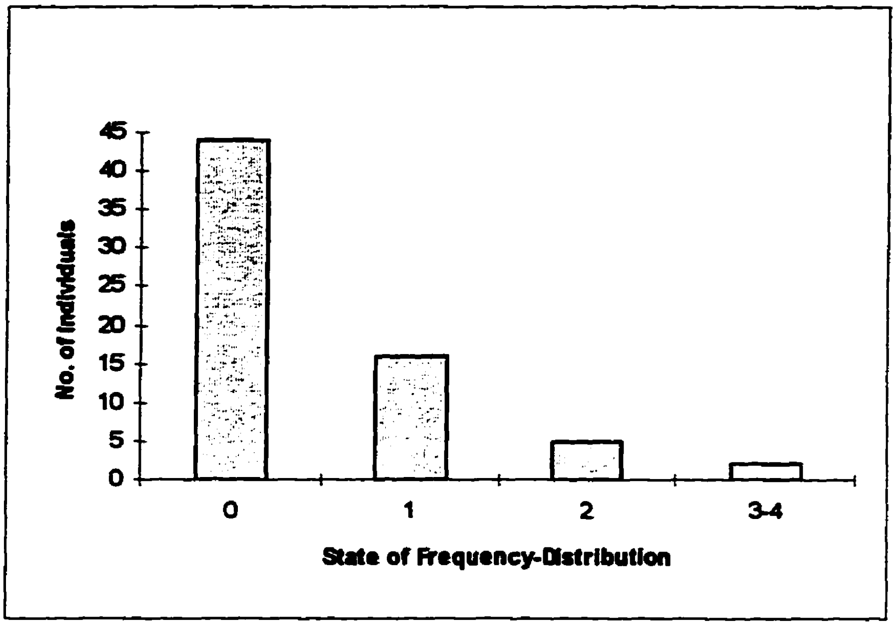


Figure 8.3. States of frequency-distribution of artifacts in the Zarkou cemetery.

5. Spatial Distribution

Due to the nature of the excavations at Zarkou, the only obvious spatial barriers were the walls segregating the burials (see Illus. 8.12). These walls spatially distinguish the burials found in 1974 from those found along the trench during 1976. The spatial distribution of the primary affinity categories revealed no discernible pattern if all burials were considered as one group. It was undesirable to employ any type of monothetic-divisive techniques to determine the spatial clustering of burials based upon their attributes. It was, however, necessary to establish if the mortuary population was composed of smaller socially significant groups. To establish if smaller social units were indeed made spatially distinctive, it was necessary to divide the cemetery into smaller spatial units and compare them for similarities. As a starting point, three spatial units were identified and analyzed for similarities.

Gallis (1982) roughly defined two primary groups: the one excavated in 1974, the other in 1976. However, upon studying the plans of the cemetery it was obvious that one other spatially distinct group of burials could identified (Illus. 8.17). Group 1 was considered to be the graves found during 1974, which lie between the two walls. Group 2 included the burials found in the trenches opened to the northeast of this. Group 3 includes the burials to either side of the ditch southwest of the trenches. Within the trench that makes up Group 3, two further clusters were distinguished. These groups are ambiguously defined, so it was necessary to establish a method to test the relationships between these hypothetical groups.

In order to test group similarity, three technological (nos. 1-3) and three social variables (nos. 4-6) were selected for analysis:

1) pre-condition of skeletal remains;
2) the degree of bone incineration;
3) bone modification;
4) treatment program;
5) age and sex structure; and
6) the energy expended in the mortuary treatment of the dead.

The first three variables refer to the technological aspect of mortuary ritual (cf. Fowler in press). The functional use of certain technologies is often limited. In this case, the tools used to prepare the body before cremation (leading to the pre-cremated condition of bones) and in the cremation method (resulting in the degree of incineration and the final modification of the bone through burning) are considered technological variables. The assumption is that the pre- and post-condition of the skeletal remains is initially a result of the tools used to prepare the body (if any) and the type (in this case wood) and intensity of fire used in cremation. There is little evidence to suggest substantive bone modification through post-depostional attrition (cf. above for pre-depositional attrition by burning). This may be largely because the remains were housed in burial vases. The last three variables refer to the cultural or social aspect of mortuary ritual (cf. Fowler in press). The patterning of these variables is a result of cultural norms and rules of behavior. These rules are assumed to compose the normative mortuary disposal program. The behaviors governing the treatment of the corpse, who is to be included or excluded from the cemetery based upon age and sex, and the energy expended in mortuary activity, are all socially driven variables.

To measure inter-group similarity in these variables the Pearson's r correlation coeffecient was employed. Pearson's r determines the linear relationship between variables. In other words, the statistic determines whether large values of one set are associated with large values of another (positive correlation), whether small values of one set are associated with the large values of another (negative correlation), or whether values in both sets are unrelated (correlation near zero). This method was used to determine fine differences and similarities between the data arrays of each arbitrary grouping.

a) Spatial Variation in Technology

This analysis compares the technology base used in the disposal program. This test shows consistent similarity between Group 1 and Group 3 (Table 8.6). These two groups are very similar in terms of the technology used in mortuary ritual (upwards of 97% similar). In contrast, Groups 1 and 2, and Groups 2 and 3, show very little similarity. This suggests that Group 1 is more similar to Group 3. Therefore, it appears that similar technologies were used to prepare and treat the dead in Groups 1 and 3. Different technologies must have been used in the preparation of the dead in Group 2.

Pre-condition of Bone Elements

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	0.506803034	1	
Group 3	0.963572844	0.465999212	1

° of Incineration

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	0.327326835	1	
Group 3	0.970725343	0.09078413	1

Bone Modification Type

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	0.506803034	1	
Group 3	0.963572844	0.465999212	1

Table 8.6. *Similarity in three technological variables of the disposal program at Zarkou.*

b) Spatial Variation in Social Variables

The spatial comparison of social variables shows a different pattern (Table 8.7). In this case, the treatment of the corpse is identical in all groups. The age and sex distribution in each group is also quite similar, although it is the highest between Groups 1 and 3. As well, the energy expenditures in each group are highly correlated. Therefore, the three spatial groups are not socially differentiated.

Treatment of the Corpse*

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	1	1	
Group 3	1	1	1

*excludes indeterminate cases of body treatment

Age and Sex Distribution

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	0.717694112	1	
Group 3	0.941265749	0.791085048	1

Energy Expenditure

	Group 1	*Group 2*	*Group 3*
Group 1	1		
Group 2	0.995745122	1	
Group 3	0.988986631	0.998324533	1

Table 8.7. *Similarity of three social variables of the disposal program at Zarkou.*

c) Summary and Conclusions

These results suggest that the burials at Zarkou fall into one of three distinct spatial groupings: Group 1 between the two walls in the southwest; Group 2 to the northeast of this; and Group three to the south of this. The variation in the technological variables suggests that different technologies were used in the preperation and cremation of the dead in Group 1 and 3. Therefore, it appears that during the life-span of this cemetery there was a change in the technology used to prepare the dead. This is most apparent in the degree of incineration of the remains. The remains in Group 1 and 3 are more highly burned than those in Group 2. This implies that lower temperatures were used to cremated the dead in Group 2. Therefore, it is likely that this group holds either the earliest or latest inhabitants of the settlement. It is simply not known when this change may have occurred. Overall, then, the technological variables suggest that disposal may have occurred sequentially from Group 2-1-3, or from Group 3-1-2.

In contrast, there is little fluctuation in the social variables. Only the age and sex distribution do not have an extremely high correlation between the groups. There is little change in the social directives of disposal in this cemetery. This suggests that the same society used the cemetery over an extended period of time. Further, the high correlation of social variables contrasts with the noticeable change in technology. This implies that, even though there was a change in the technological methods used to dispose the dead, this did not affect the social norms and rules of behavior governing the normative disposal of the dead. It is, therefore, most likely that one socio-economic group is represented in this cemetery, and its members may have been buried in different locations according to kin membership or generational affiliation.

6. Symbolic Designations

Symbolic designations are manifest at Zarkou by the use of valued symbols and the energy expended in mortuary treatment. Valued symbols are severely constrained in terms of their distribution throughout the cemetery (Table 8.8). Only after a score of 48 in the index did artifacts become commonly distributed throughout the three groups. Valued symbols are defined in this assemblage by a score of less than 48. These are only found in 10% of all the graves, and are confined to particular graves within the three groups.

	Location			
Index Score	Group 1	Group 2	Group 3	Grand Total
42	1	0	0	1
44	0	0	1	1
45	0	0	1	1
46	0	1	0	1
47	0	0	2	2
48	0	0	1	1
49	1	2	1	4
50	2	3	0	5
51	1	1	2	4
52	9	1	2	12
53	2	2	1	5
54	6	0	5	11
55	2	6	11	19
Grand Total	24	16	27	67

Table 8.8. *Spatial distribution of valued symbols in the Zarkou cemetery.*

The grave with the highest score in the value index is found in Group 1 (Grave 27). This is an extremely high score compared to others in the same spatial group. The difference between this grave and the next is 7 points. This grave held the remains of an adult of undifferentiated sex. In Group 2, again only one individual had a high score. The individual in Grave T14 was also an adult of indeterminable sex. Three points separate this individual's score from the next in the same group. Group 3 is the only group where more than one individual holds valued symbols. The highest scores belong to Graves T22 and T24a, which both held juveniles. Two other individuals (T28b, T34), had scores slightly lower than the juveniles. Only the age of the individual in T28b was determinable, and this was an adult. The other individual in Group 3 with a high score was the adult interred in grave T24b. Perhaps what is most interesting about this distribution is the

Ft #	EX Score	Rank Level	Age-Sex
27	50	1	undiff Adult
T22	52	2	undiff Juvenile
T24a	53	2	undiff Juvenile
T14	54	2	undiff Adult
T28b	55	2	undiff Adult
6	60	3	undiff Juvenile
26	60	3	Adult Male
21	61	3	undiff
T7	57	3	undiff Adult
T27	57	3	undiff Adult
20	57	3	Adult Male
T4	58	3	undiff Sub-adult
T15	58	3	undiff Adult
18	58	3	undiff Adult
T6	59	3	undiff Juvenile
T34	59	3	undiff
T24b	59	3	undiff
T5	61	3	undiff
T28a	61	3	undiff Adult
T33	62	3	undiff
T39	63	3	undiff
T36	63	3	undiff Juvenile
7	63	3	undiff
24	57	3	undiff Adult
T16	60	3	undiff Adult
T13	61	3	undiff
23	61	3	undiff Sub-adult
T35b	62	3	undiff Adult
T35a	62	3	undiff Infant
T21	62	3	undiff Adult
T1	62	3	undiff Juvenile
17	62	3	undiff
T41	63	3	undiff
T25	63	3	undiff Adult
T17	63	3	undiff
T11	63	3	undiff
14	63	3	undiff
5	63	3	undiff
4	63	3	undiff
3	63	3	undiff
2	63	3	undiff
1	63	3	undiff
T26	64	3	undiff
10	64	3	undiff
T38	65	3	undiff
T2	65	3	undiff
15	65	3	undiff
13	65	3	undiff
12	65	3	undiff
11	65	3	undiff
8	65	3	undiff
T42	66	3	undiff
T40	66	3	undiff
T37	66	3	undiff
T31	66	3	undiff
T30	66	3	undiff
T29	66	3	undiff
T23	66	3	undiff
T20	66	3	undiff
T19	66	3	undiff
T18	66	3	undiff Juvenile
T12	66	3	undiff
T10	66	3	undiff
16	66	3	undiff
T32	67	3	undiff
9	67	3	undiff
T8	69	4	undiff Adult

***Table 8.9.** The distribution of energy expenditure scores at Zarkou.*[4]

presence of juveniles. Both juvenile's graves lie in the southeast corner of the cemetery, somewhat separated from the other burials in Group 3 (T22, T24a).

At Zarkou the scores in the energy expenditure index are almost consecutive (Table 8.9). Nevertheless, three breaks in the index reveal that three levels of energy expenditure are represented in the cemetery. The premier individual is the adult interred in Grave 27. The second level is composed of two adults (T28b, T14) and two juveniles (T22, T24a). These two juveniles also had valued symbols in their respective grave assemblages. The third level is the largest group with 61 individuals. The fourth level is represented by one individual with a low energy expenditure score. This result is consistent with the frequency-distribution analysis above. Both analyses predicted four rank levels for Zarkou. The discrepancy in the frequencies of individuals in each level result from these two analyses will be addressed below.

The distribution of the energy expenditure scores (and social rank) is not uniform between each spatial group in the cemetery. This is probably a by-product of the unequal distribution of individuals between the groups. However, a certain pattern emerges if the energy expenditure level of each individual is mapped (Illus. 8.18). Several characteristics appear within each of the groups:

1. an individual with high energy expended in their mortuary treatment is found to be roughly "central" in each grouping (either Rank 1 or 2);
2. within the immediate vicinity of these individuals are members of the third rank level;
3. generally, as one moves away from the premier individual, the amount of energy expenditure decreases; and finally,

4. within each of the smaller sub-groupings of burials there is always at least one individual with higher energy expenditure than the others (e.g., T39, T40, T38; or sub-group B in Group 1).

7. Mortuary Differentiation and Social Distinctions

a) *Normative Treatment*

Despite the variability in the Zarkou cemetery, there are numerous features that the burials share in common (Table 8.10). In all cases, the burial facility is thought to have been circular pits, averaging about 0.2 m^3 in volume, with earth or bedrock floors. The burials are located in a formal, bounded cemetery, characterized by three spatially distinct sub-groups. All individuals at Zarkou were cremated before being interred. They were then placed in burial urns and disposed in a solitary pit. I have argued above that the body must have gone through at least a two-stage preparation procedure. The state of the cremated remains suggests that the majority of bodies were prepared through a process of defleshing, followed by the cremation of a select group of bone elements.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Shape	circular
	Avg. Volume (m^3)	0.2 m^3
	Floor	earth or bedrock floor
	Walls	none
	Interior	none
	Exterior	none
	Formal Disposal Type	cemetery
	Special Features	bounded area: crematorium
Preparation and Treatment	Age-Sex Categories	skewed due to skeletal preservation
	Interment Type	cremation
	Posture	n/a
	Orientation	n/a
	PBA	n/a
	Cultural Modification	defleshing and cremation
Burial Scenario	Interment Form	single burial
	Ritual Process	secondary burial
Burial Goods	Raw Material	pottery
	Avg. #/interment	1.94
	Source	local manufacture
	Distance	>100 km
	Manufacture	locally-made goods
	Function	sociotechnic/technomic

Table 8.10. The normative mortuary treatment of the burial at Zarkou.

Pottery is the most common class of burial gifts in the Zarkou cemetery, and roughly two gifts is the average per single interment. All gifts are of local manufacture. The resources required for their creation are located within at least a 100 km radius of the site. It is most likely, then, that the burial gifts were not obtained through trade, exchange, or through the exploitation of resources located beyond the general region of exploitation utilized by the settlement. The burial furniture at Zarkou is unique, however, because of the range of functions they exhibit. Much of the pottery had a life-use before being adopted as burial urns. There is also a small degree of variation between the types used in the mortuary ritual. This suggests that the burial urn had only a technomic function in the burial ritual, and did not act as a socio-economic marker. On the other hand, the burial gifts suggest more sociotechnic functions in their use. Several artifacts acted to differentiate individuals. These artifacts are unique and were solitary occurrences. They are also characterized by a large amount of energy expended in their manufacture.

In general, mortuary differentiation at Zarkou is characterized by:

1. differential pre-interment treatment of the dead;
2. the differential frequency and specific allocation of certain grave goods to particular individuals;
3. five "wealth" levels represented by the frequency-distribution of burial gifts;
4. three spatially distinct disposal areas all exhibiting a similar pattern in the distribution of rank levels: the lower levels radiating outwards from the central, high ranking individual to the boundaries of the group; and
5. four different levels of energy expended in the mortuary treatment.

b) Social Distinctions

(1) Vertical Social Differentiation

All three dimensions of social distinctions were observed at Zarkou. Vertical distinctions are characterized by high energy expenditure and frequency of grave goods, the specified use of valued symbols, and the location of the burial facilities (Table 12). A study of the formal, symbolic, and artifact differentiation in the Zarkou cemetery identified four social rank levels. The frequency-distribution analysis of the burial gifts at Zarkou revealed a five-tiered dispersal of grave goods. This pattern represents a five -level system of achieved status, signifying differential access to resources. When the results of these two analyses were combined, it allowed five more specific vertical social statuses to be identified (Table 8.11).

The first rank level is characterized by high energy expenditure, valued symbols, and the most grave goods. The second rank level is defined by moderate energy expenditure, the use of valued symbols, and the presence of grave goods. The differential frequency of grave goods in this rank level signifies two different status positions. The upper status is defined by moderate energy expenditure and the presence of two grave goods. Three individual were identified to this status. The lower status is represented by moderate energy expenditure and only one good. Only one individuals belongs in this status. Individuals in the third rank level had low levels of energy expenditure, and had either non-valued symbols, or few if any grave goods. Four finer status positions were identified

Fr #	EX Score	Rank Level	# Goods	Age-Sex
27	50	1	4	undiff. Adult
T22	52	2	2	undiff. Juvenile
T24a	53	2	2	undiff. Juvenile
T14	54	2	2	undiff. Adult
T28b	55	2	1	undiff. Adult
6	60	3	3	undiff. Juvenile
26	60	3	2	Adult Male
21	61	3	2	undiff.
T7	57	3	1	undiff. Adult
T27	57	3	1	undiff. Adult
20	57	3	1	Adult Male
T4	58	3	1	undiff. Sub-adult
T15	58	3	1	undiff. Adult
18	58	3	1	undiff. Adult
T6	59	3	1	undiff. Juvenile
T34	59	3	1	undiff.
T24b	59	3	1	undiff.
T5	61	3	1	undiff.
T28a	61	3	1	undiff. Adult
T33	62	3	1	undiff.
T39	63	3	1	undiff.
T36	63	3	1	undiff. Juvenile
7	63	3	1	undiff.
24	57	3	0	undiff. Adult
T16	60	3	0	undiff. Adult
T13	61	3	0	undiff.
23	61	3	0	undiff. Sub-adult
T35b	62	3	0	undiff. Adult
T35a	62	3	0	undiff. Infant
T21	62	3	0	undiff. Adult
T1	62	3	0	undiff. Juvenile
17	62	3	0	undiff.
T41	63	3	0	undiff.
T25	63	3	0	undiff. Adult
T17	63	3	0	undiff.
T11	63	3	0	undiff.
14	63	3	0	undiff.
5	63	3	0	undiff.
4	63	3	0	undiff.
3	63	3	0	undiff.
2	63	3	0	undiff.
1	63	3	0	undiff.
T26	64	3	0	undiff.
10	64	3	0	undiff.
T38	65	3	0	undiff.
T2	65	3	0	undiff.
15	65	3	0	undiff.
13	65	3	0	undiff.
12	65	3	0	undiff.
11	65	3	0	undiff.
8	65	3	0	undiff.
T42	66	3	0	undiff.
T40	66	3	0	undiff.
T37	66	3	0	undiff.
T31	66	3	0	undiff.
T30	66	3	0	undiff.
T29	66	3	0	undiff.
T23	66	3	0	undiff.
T20	66	3	0	undiff.
T19	66	3	0	undiff.
T18	66	3	0	undiff. Juvenile
T12	66	3	0	undiff.
T10	66	3	0	undiff.
16	66	3	0	undiff.
T32	67	3	0	undiff.
9	67	3	0	undiff.
T8	69	4	0	undiff. Adult

Table 8.11. *Rank and status differentiation at Zarkou. Double line indicates rank level and single line signifies status differentiation within the rank level.*

in the third rank level. The first status holds one individual who had low energy expenditure, but had three grave goods. The second status position is defined by low energy expenditure and two grave goods. Two individuals belong to this status. The third status is characterized by low energy expenditure and one grave goods. Fourteen individuals were identified to this status. The lowest status is illustrated by low energy expenditures and the absence of grave goods. The largest portion of the mortuary population belongs to this status (n=43 individuals). The single individual in the fourth rank level had low energy expenditure and a non-normative burial treatment.

The artifact assemblage and special treatment of one individual suggests a unique social distinction (Table 8.14). The adult buried in Grave 27 is the highest ranked individual at Zarkou, and had the greatest number of burial gifts. Among these gifts, this individual had a figurine as part of the burial assemblage. This is the only purposeful inclusion of a figurine in an individual's mortuary assemblage in this cemetery. The high rank of this individual combined with this unique find, suggests that this person may have acted in some ritual capacity at Zarkou.

Several forms of elevated social position were also discernible at Zarkou (Table 8.12). Three adults had a central position within each of the three spatial sub-groups. All these individuals belong to the higher rank levels and "wealth" categories. Some form of elevated social position is also possibly represented at Zarkou. This analysis revealed that four individuals in the second rank level (T28b, T27, Grave 20, and T15) were given either one or two red sherds as burial gifts. It is quite possible that the red sherd was indicative of some finer status position, either in the rank level or the society as a whole.

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation	Comments
Vertical Distinctions						
Achieved Wealth or preferential access to resources		All	All		0-4 goods	
Ritual Office?	1*	Adult		high energy expenditure; central burial location	figurine; upper wealth category	
Elevated Social Position						
Special Prestige Positions	1*	Adult	?	high energy expenditure; first rank level; location of burial	most grave goods; upper wealth category	
	3	Adult	?	high energy expenditure; second rank level; location of burial	valued goods; upper wealth category	central location in Groups 1-3
	4	Adult	?	second rank level; burial location	red sherd	immediately near highest ranked individual in Group
Hereditary Social Ascription	2**	Juveniles		energy expenditure; location of graves	second wealth and rank categories	isolated graves
Horizontal Distinctions						
Corporate Group		All	All	location of graves		
Age Status	15? (min.)	Adult			large open and closed vessel types	precise number difficult to determine due to the variable preservation
Special Status Distinctions						
Circumstances of Death?	2**	Juveniles	?	location of graves; high energy expenditure for age		
	1	Adult	?	location of grave; low energy expenditure	none	
* and ** Denotes same individuals						

Table 8.12. The dimensions of social distinctions represented at Plateia Magoula Zarkou.

It was determined that two juveniles belong within the second rank level (Table 8.13). The only other individuals in this rank level were of adult age.[5] This shows that status was not only attained through the effort of the individual at Zarkou, such as shown with the status levels, but was also accorded to select individuals. This signifies the ascription of status, most probably through lines of heredity.

	Rank Level				
Age-Sex	1	2	3	4	Grand Total
Adult Male	0	0	2	0	2
undiff. Adult	1	2	10	1	14
undiff. Sub-adult	0	0	2	0	2
undiff. Juvenile	0	**2**	5	0	7
undiff. Infant	0	0	1	0	1
undiff.	0	0	41	0	41
Grand Total	1	4	61	1	67

Table 8.13. *The distribution of age by rank level at Zarkou. The juveniles in the second rank level are highlighted in bold.*

(2) Horizontal Social Distinctions

Two types of horizontal social distinctions were determined through a study of formal, symbolic, and artifact differentiation (Table 8.12). First, the spatial data suggests that there is one corporate group at Zarkou. The social similarities between the groups argues for congruency. On the other hand, different technologies were used to prepare the dead in the one of the three groups. This, however, only implies that there was a change in technology used for cremating the dead while the cemetery was in use. This did not affect the way individuals were socially differentiated. There are two possible scenarios that could lead to this pattern: 1) this pattern represents the successive deposition of three generations of inhabitants of the Zarkou settlement; or 2) the pattern illustrates spatial distinctions made upon the basis of kinship relations. Regardless, the data is simply not adequate to infer more than one contemporary corporate group existed at Zarkou. As well, it is virtually impossible to determine the chronology of the groups, if indeed they are accurate. Therefore, based upon the present evidence, one socio-economic group existed during this LN 1 occupation of Zarkou.

Second, it was also possible to distinguish age statuses at Zarkou. Age-based constraint on mortuary treatment is represented by the artifact distribution. Only large open and closed types of vessels were given to adults. Other age or sex statuses were impossible to determine based on the variable preservation of the cremated remains.

The only exceptions to the social distinctions determined thus far, are found with two juveniles (T22, T24a) and one undifferentiated adult (T8). The juveniles belong to the second rank, but it unusual that they are placed in relative isolation from the other graves. One juvenile (T22) was given a red sherd, signifying some connection with the elevated social position noted above. If not for any other reason, it is possible that both juveniles were buried away from others in the cemetery due to the circumstances surrounding their death. As both are young, it is certain that their deaths were untimely and unexpected. Only in these two cases was social position marked by symbolic and artifact differentiation, and not expressly through formal preparation of the body and the grave.

The other non-normative treatment was given to the adult in grave T8. Two explanations for this adult's alternative treatment may be considered: 1) despite the lack of pathological evidence (most likely due to cremation), this individual's death may have been the result of an accident or other unfortunate event; 2) considering the density of settlement in Thessaly during this phase (cf. Gallis 1989), this person may have been an outsider to the community and was therefore given an alternative treatment.

Appendix Table 8.1. Descriptions of the burial facilities at Plateia Magoula Zarkou.

Phase	Fr #	Sk #	Location		FacType	Shape	Length	Width	Depth	Volume	Intform
			Macro	Meso							
LN 1	1		ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	2		ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	3		ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	4		ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	5		ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	6	1	A	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	7		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	8		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	9	2	B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	10		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	11		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	12		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	13		B	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	14		G	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	15		D	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	16		D	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	17	3	D	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	18	4	E	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	20	5	E	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	21		E	Group 1	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	23	6	E	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	24	7	E	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	26	8	ST	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	27	10	ditch	Group 1	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T1	12	N A-B	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T2	13	N A-B	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T4	14	TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T5		TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T6	15	TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T7	16	TA	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T8	17	TA	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T10	18	TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T11	19	TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T12	dest.	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T13	20	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T14	21	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T15	22	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T16	23	TG	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T17	24	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T18	25	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T19	dest.	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T20	dest.	ditch	Group 4	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T21	26	ditch	Group 4	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T22	27	ditch	Group 5	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T23	dest.	ditch	Group 4	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T24a	28	ditch	Group 5	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T24b		ditch	Group 5	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T25	29	ditch	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T26		TA	Group 2	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T27	30	TD	Group 2	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T28a	31	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T28b	32	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T29	dest.	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T30	dest.	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T31	dest.	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T32	33	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T33		ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation

Appendix Table 8.1 con't. Descriptions of the burial facilities at Plateia Magoula Zarkou.

Phase	Fr #	Sk #	Location		FacType	Shape	Length	Width	Depth	Volume (m^3)	Intform
LN 1	T34	34	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T35a	35	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T35b	35	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T36	36	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T37	dest.	ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T38		ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T39		ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	
LN 1	T40		ditch	Group 3	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T41	38	ditch	Group 4	pit	circular	0.7	0.7	0.7	0.26939	jar cremation
LN 1	T42	dest.	ditch	Group 4	pit	circular	0.7	0.7	0.7	0.26939	

Appendix Table 8.2. The distribution of bone elements in the cremation burials at Zarkou.

Fr #	Sk #	Grave "Group"	Bone Element Present						
			Cranial	Vertebra	Ribs	Scapula	Post-Cranial	Frags	Animal
1		pre-excavation					X		
2		pre-excavation					X		
3		pre-excavation					X		
4		pre-excavation					X		
5		pre-excavation					X		
6	1	A	X	X		X	X		
7		B					X		
8		B						X	
9	2	B	X						
11		B						X	
12		B						X	
13		B						X	
14		G						X	
15		D						X	
16		D						X	
17	3	D	X				X		
18	4	E	X				X		
20	5	E	X				X		
21		E						X	
23	6	E	X	X			X		
24	7	E	X				X		
26	8	ST	X	X			X		
27	10	ditch	X	X		X	X		
T1	12	T1	X				X		
T2	13	T2	X				X		X
T4	14	TG	X				X		
T5		TG						X	
T6	15	TG						X	X
T7	16	TA	X	X	X	X	X		
T8	17	TA	X		X		X		
T10	18	TG						X	•
T11	19	TG	X				X		
T12	destroyed	TD						X	
T13	20	TD	X				X		
T14	21	TD	X	X	X		X		
T15	22	TD	X				X		X
T16	23	TG	X				X		
T17	24	TD	X				X		
T18	25	ditch	X	X	X	X	X		
T19	destroyed	ditch						X	
T20	destroyed	ditch						X	
T21	26	ditch	X				X		
T22	27	ditch	X				X		
T23	destroyed	ditch						X	
T24a	28	ditch	X				X		
T24b		ditch						X	
T25	29	ditch	X				X		
T26		TA						X	
T27	30	TD	X	X	X	X	X		
T28a	31	ditch	X	X			X		
T28b	32	ditch	X				X		
T29	destroyed	ditch						X	
T30	destroyed	ditch						X	
T31	destroyed	ditch						X	
T32	33	ditch	X				X		

Appendix Table 8.2 con't. The distribution of bone elements in the cremation burials at Zarkou.

Fr#	Sk#	Grave "Group"	Bone Element Present						
			Cranial	Vertebra	Ribs	Scapula	Post-Cranial	Frags	Animal
T33		ditch	?				X		
T34	34	ditch	X				X		
T35a	35	ditch	X	X	X		X		
T35b	35	ditch	X	X	X		X		
T36	36	ditch	X				X		
T37	destroyed	ditch						X	
T38		ditch	X				X		
T39		ditch						X	
T40		ditch					X		
T41	38	ditch	X				X		
T42	destroyed	ditch						X	

Notes to Chapter 8

1 The largest (>30 m long) and oldest of the *megara* was found at Magoula Visviki, and dates to the end of the LN 1. Only one report on the site was ever published, and an attempt to relocate the site in 1972 proved the earlier excavation had destroyed the site completely (Theocharis 1977:101, n.86). The site is so unique largely because monumental architecture of this kind was not again seen in Greece until the *Mycenaean* palaces in the Late Bronze Age (1580-1100 B.C.)!

2 There are still other possible explanations for the bear (*Ursus arctos*) remains in the households. The skins, or even the bones, may have had some ceremonial or ritual function; they may have been indicators of status, or perhaps acted as "trophies;" or they may have some medicinal uses (as is attested in Chinese remedies, particularly in the form of aphrodisiacs).

3 Metal artifacts of questionable date have been reported from Dhimini and Sesklo (McGeehan-Lurtzis and Gale 1988; Tsountas 1908), Corinth (Kosmopoulos 1948), and Zas Cave (Zachos 1990). The objects from Zas Cave are now, however, thought to date to the Final Neolithic (Demoule and Perlès 1993:395).

[4] The index used for Zarkou is opposite that used in other analyses. In this case, the lowest score represents the highest energy expenditure, and vice versa.

[5] Furthermore, there is no significant difference between the adult/child ratios in Rank 1/2 versus 3/4 (Fisher exact p=0.65). This suggests that some explanation must be given for the appearance of children in the higher rank level.

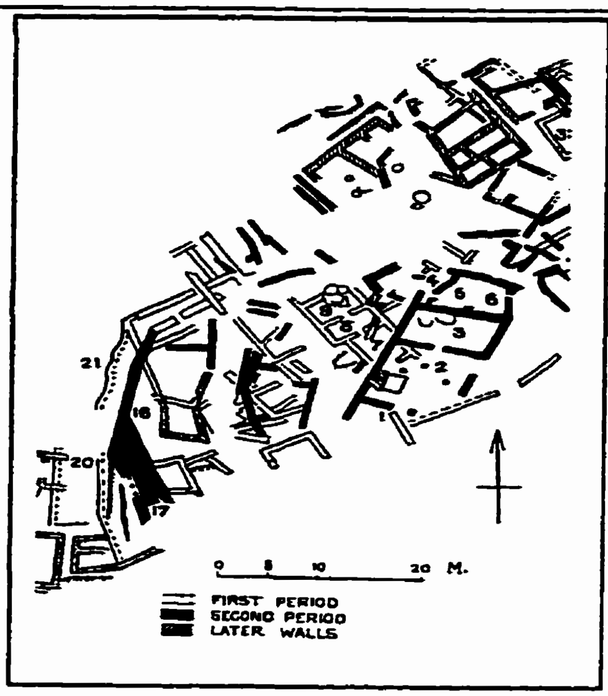


Illustration 8.1. Groundplan of Late Neolithic Seskio. Source: Wace and Thompson (1912:Fig.33).

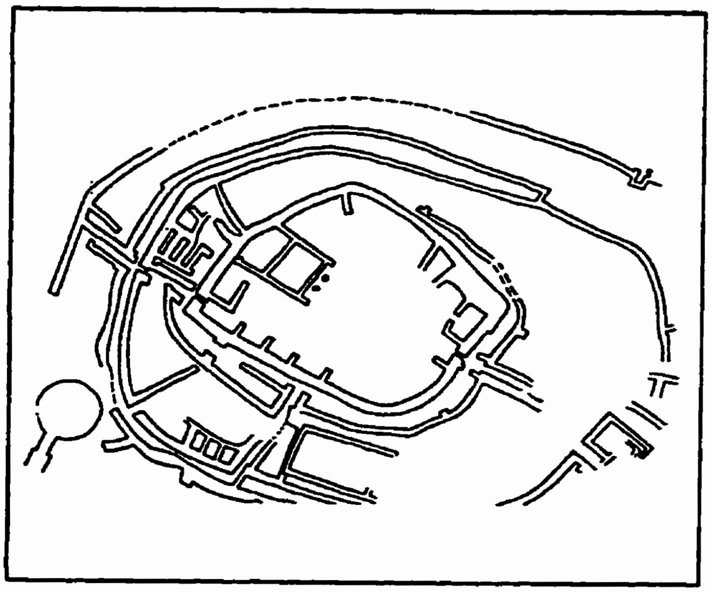
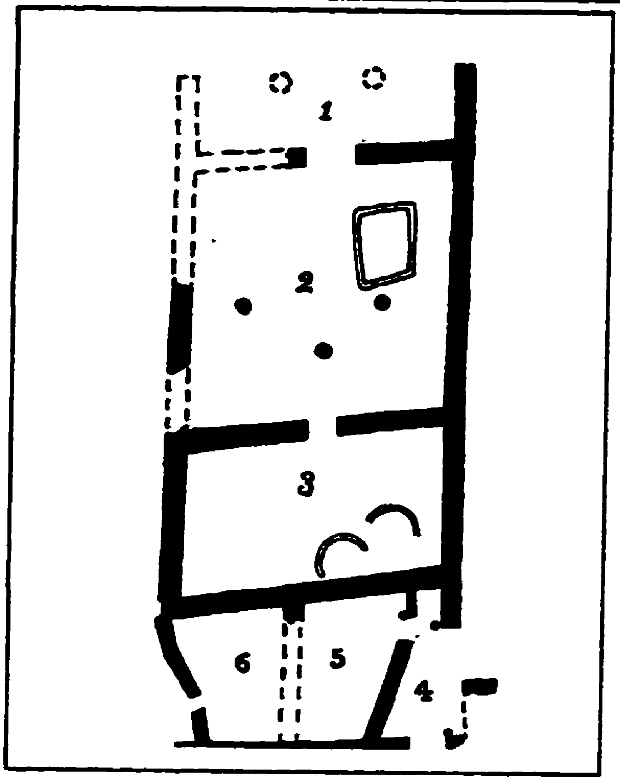


Illustration 8.2. Simplified groundplan of Late Neolithic Dhimini. Source: Vermeule (1964:17).



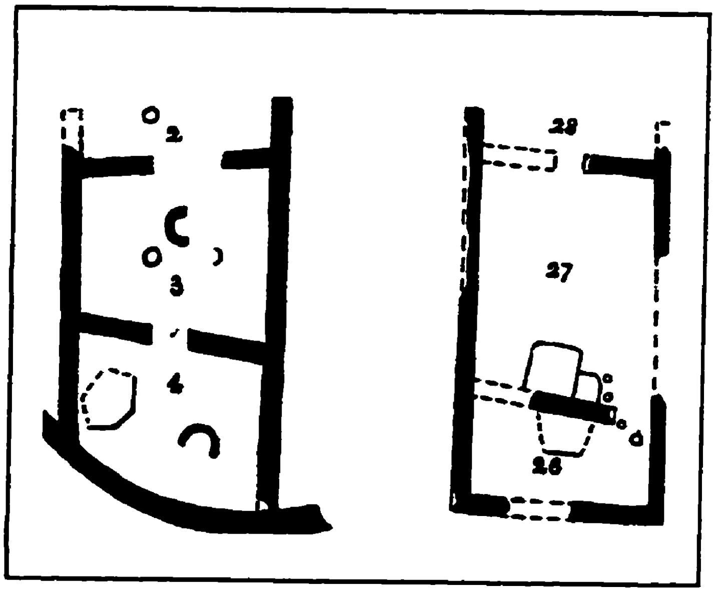
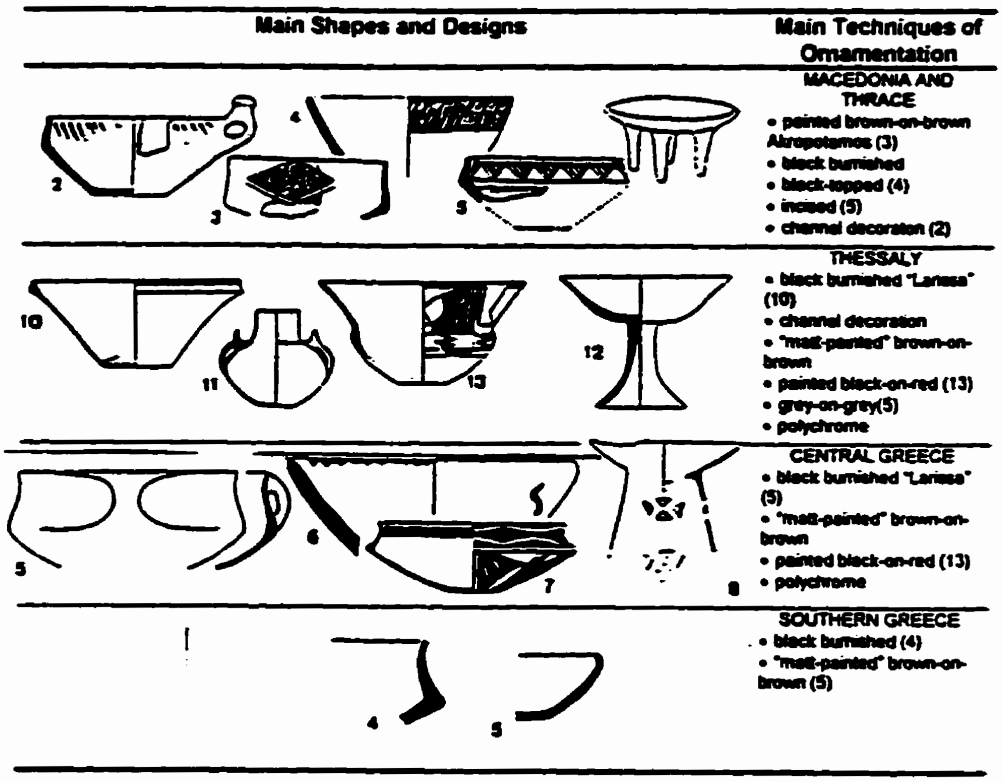


Illustration 8.3. Examples of Neolithic megaron-type structures. Upper: Seskio (Wace and Thompson: 1912:Fig. 34); Lower: two megara at Dhimini (Wace and Thompson (1912:Fig. 39).



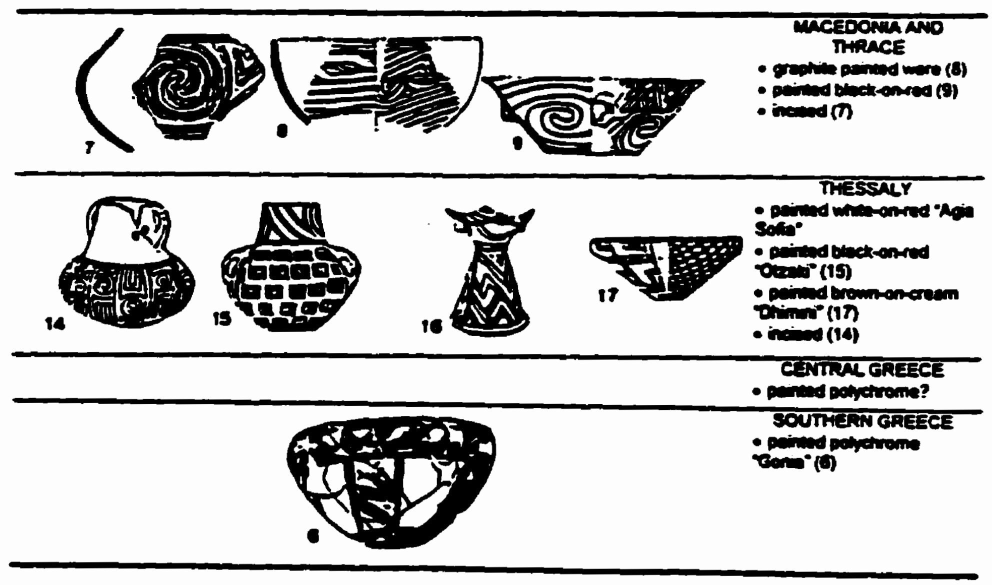


Illustration 8.5. The principle regional ceramics of the Late Neolithic 1 phase (Upper), and Illustration 8.6. The principle ceramics of the Late Neolithic 2 phase (Lower). Source: Demoule and Perlès 1993.

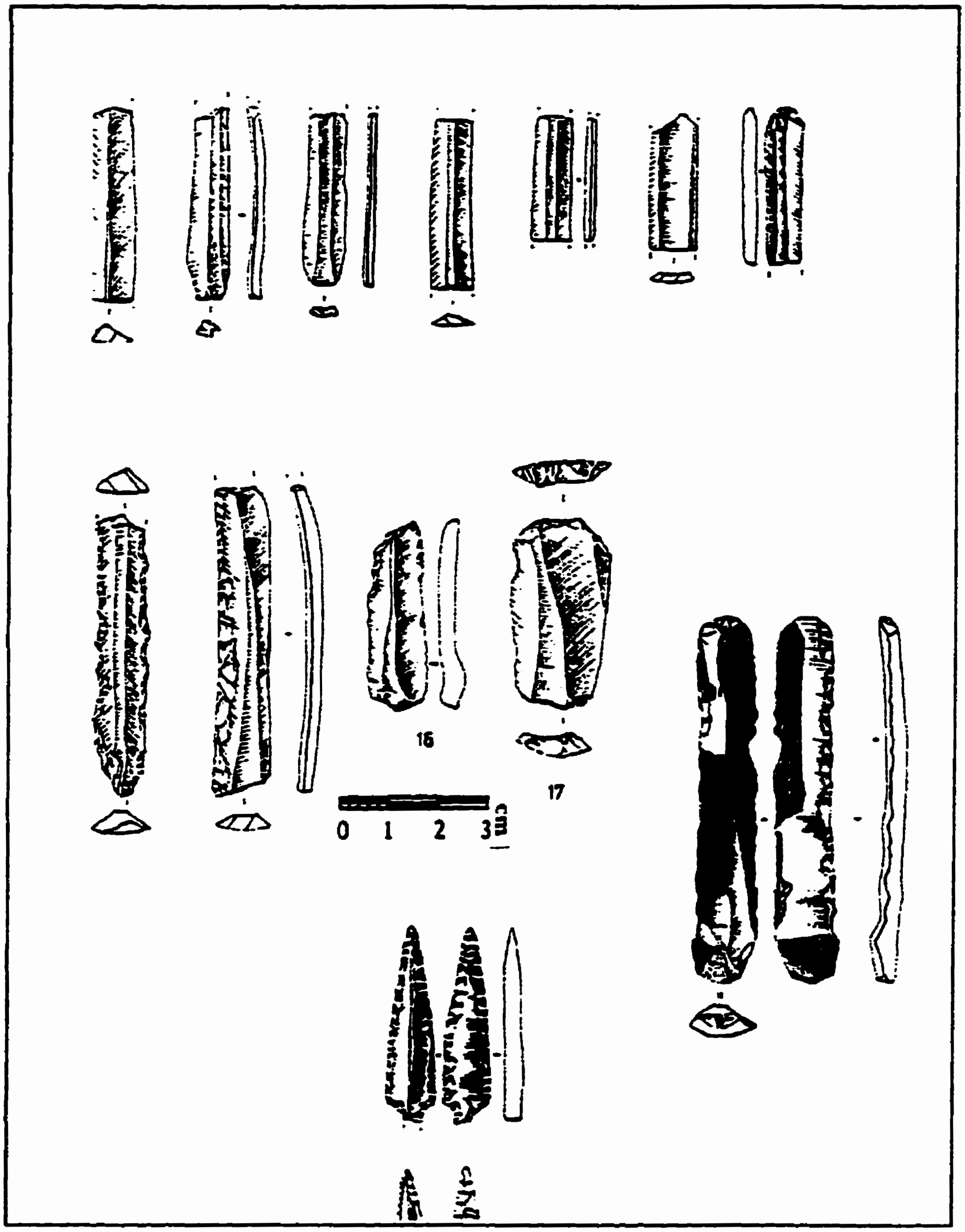


Illustration 8.6. Late Neolithic chipped stone tools. Tharrounia: (1-9), obsidian; (10), jasper; Franchthi: (11), flint. Source: Demoule and Perlès (1993:Fig. 6).

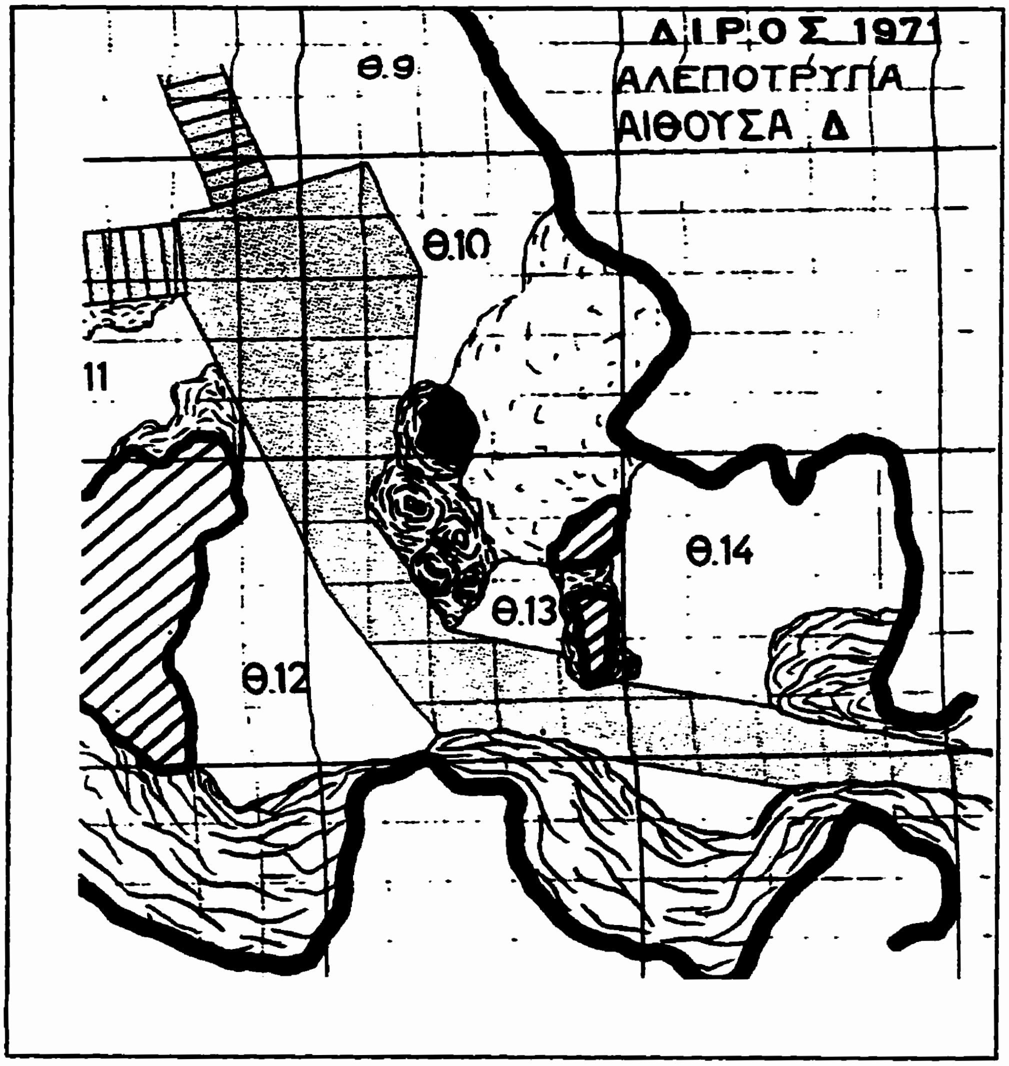


Illustration 8.7. Plan of the interior of Aleopotrypa Cave. After Papathanasopoulos 1971: Fig. 2.

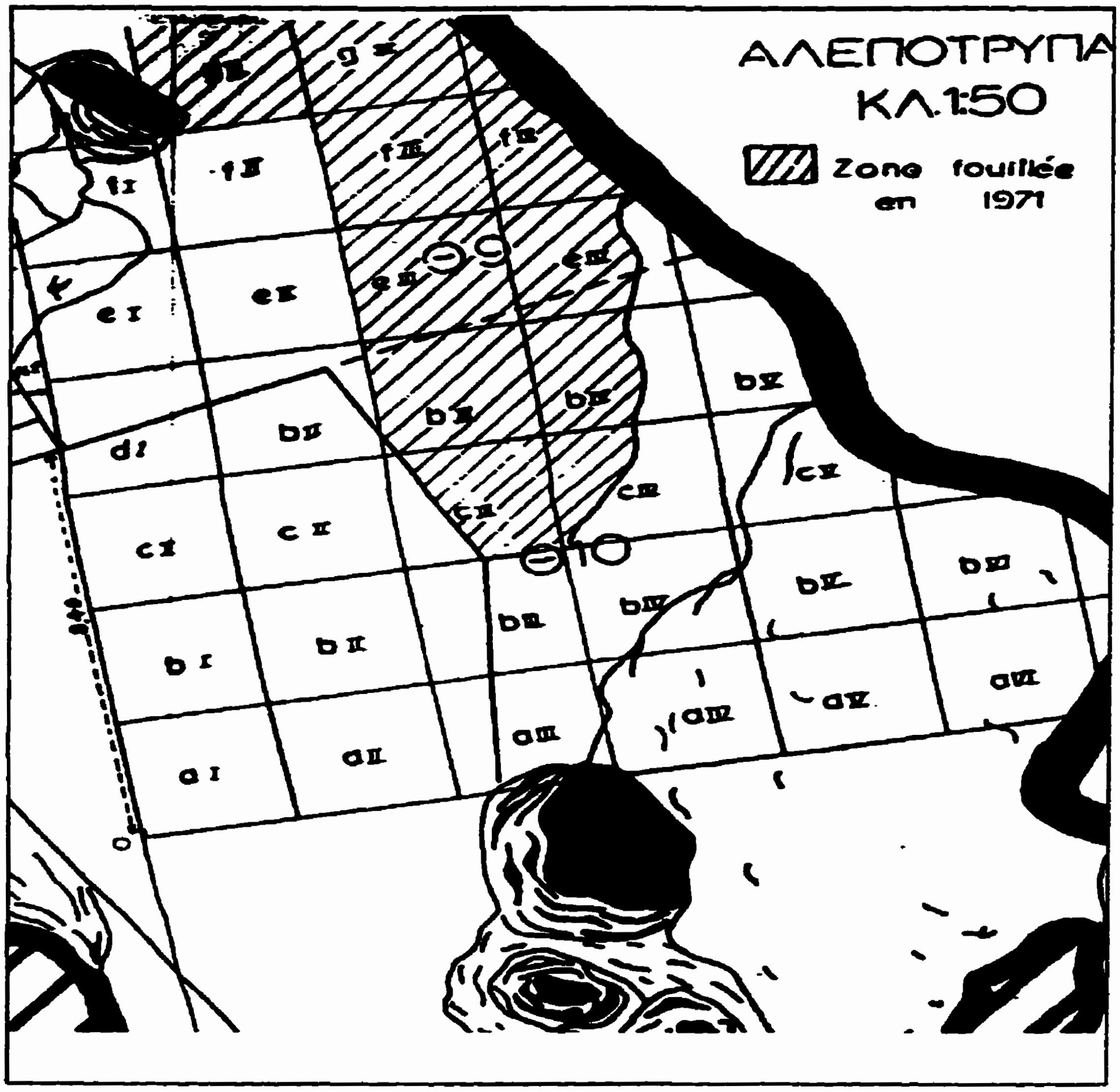


Illustration 8.8. Plan of the burial area in Aleopotrypa cave. After Lambert (1971:Fig. 5).

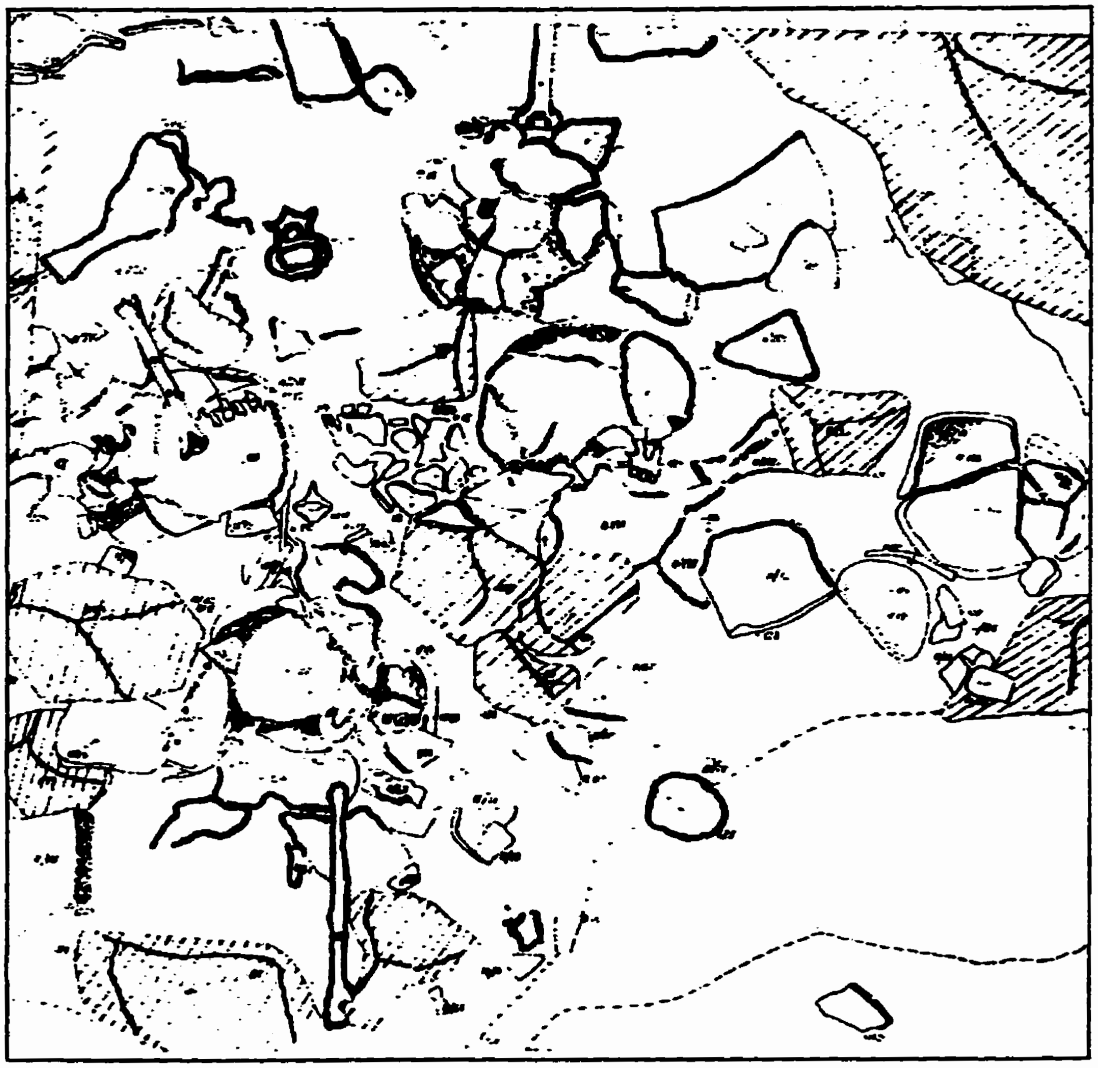


Illustration 8.9. Plan of Trench 10dIII. After Lambert 1971:Plate III.

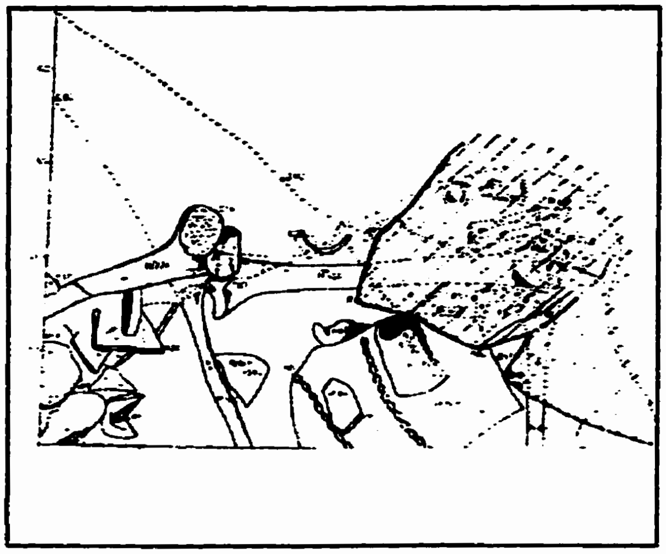


Illustration 8.10. Plan of Trench 10dIV. After Lambert 1971:Plate IV.

Illustration 8.11. Head wound of Cranium 1 as found in situ. *After Lambert 1971:Fig. 8.*

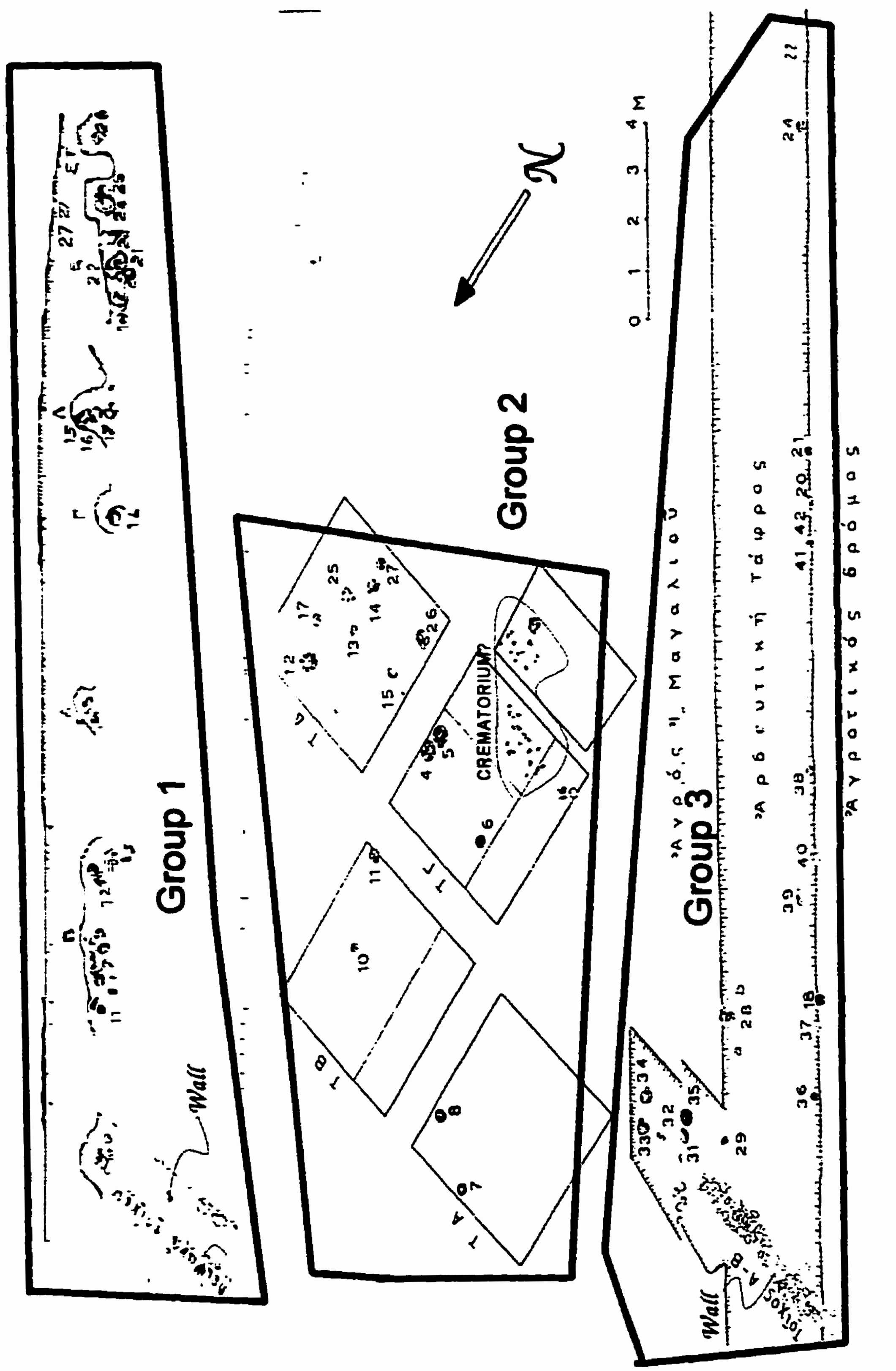


Illustration 8.12. The burials at Plateia Magoula Zarkou. Source: Gallis 1982: Fig. 11 (Group 1), Fig. 15 (Group 2 and 3).

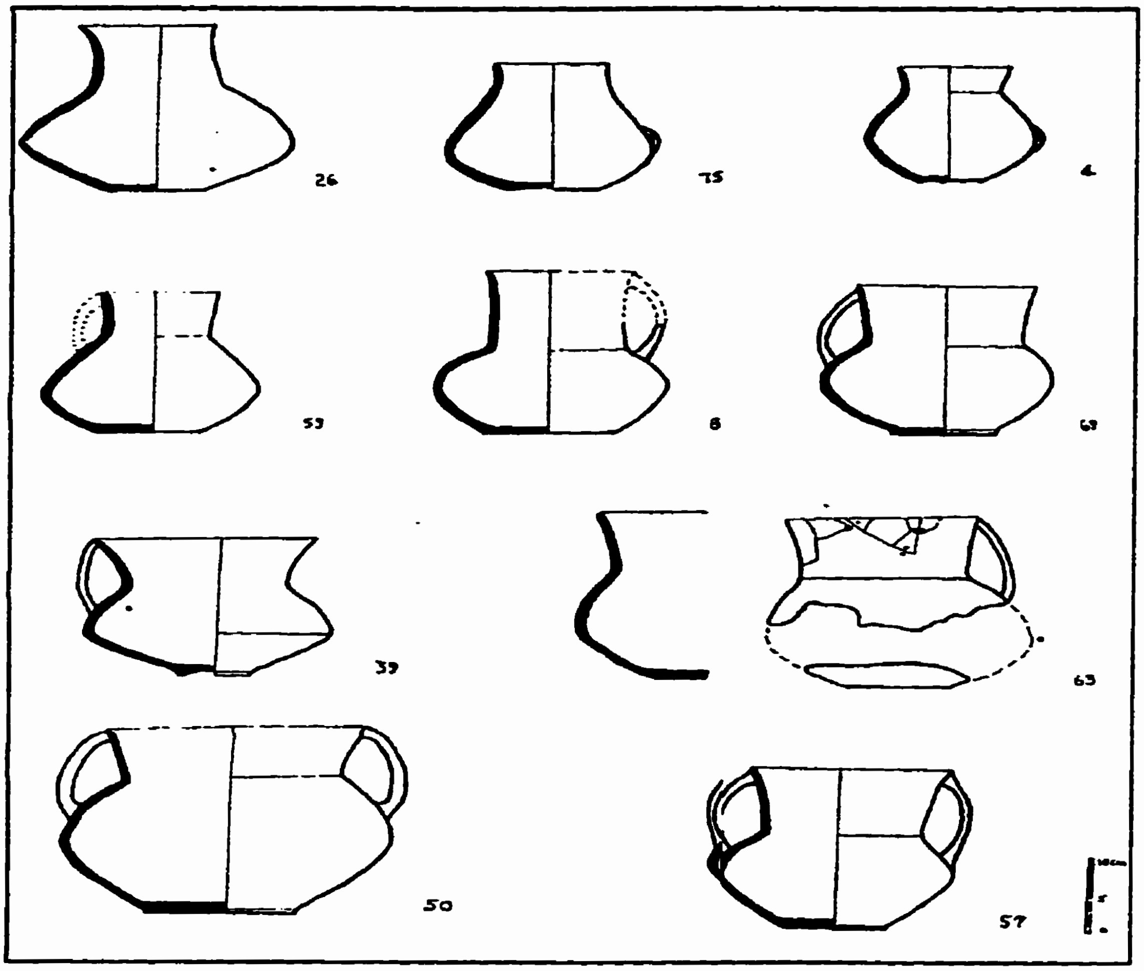


Illustration 8.13. Types of amphorae used in the Zarkou cemetery. After Gallis 1982:Fig. 10.

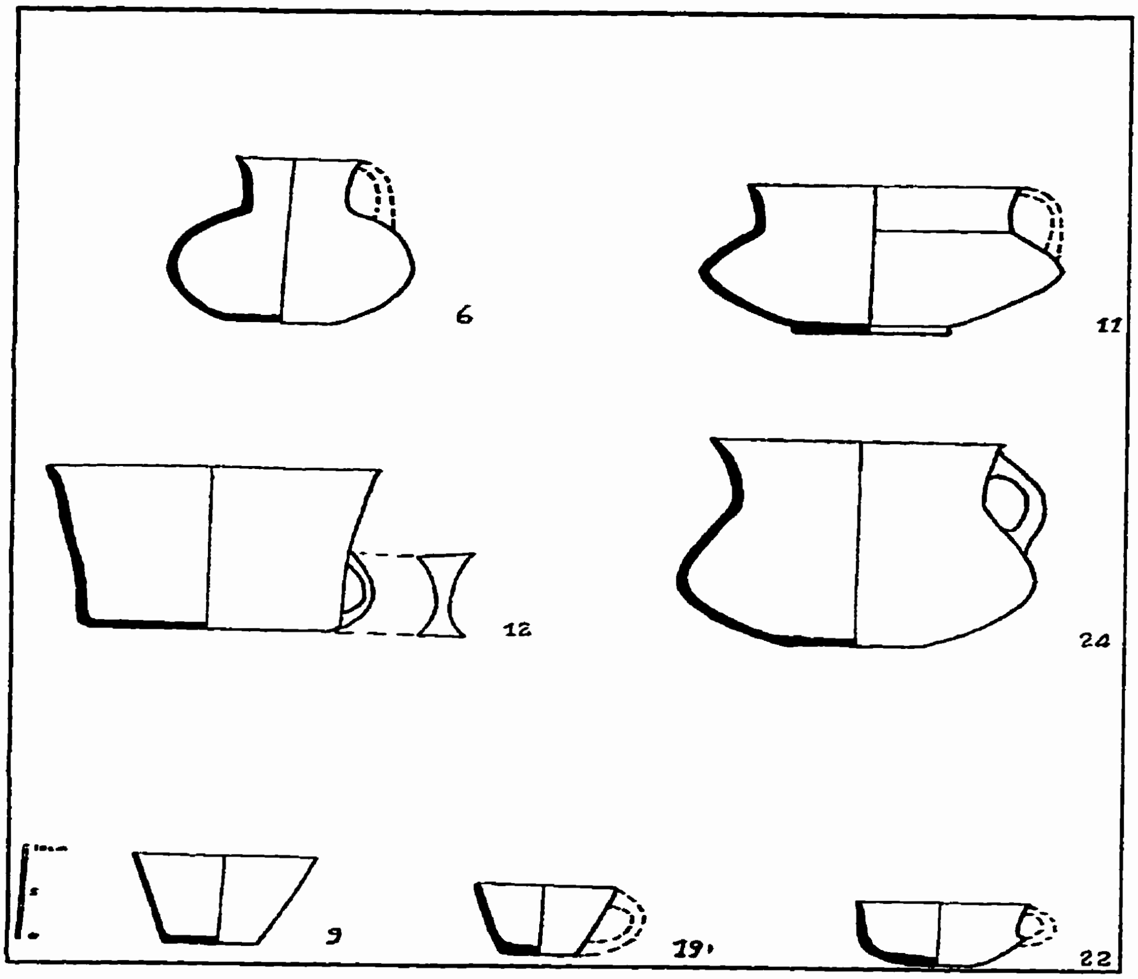


Illustration 8.14. Types of jars (6, 11, 24) and cups (12, 9, 19, 22) used in the Zarkou cemetery. After Gallis 1982: Fig. 12.

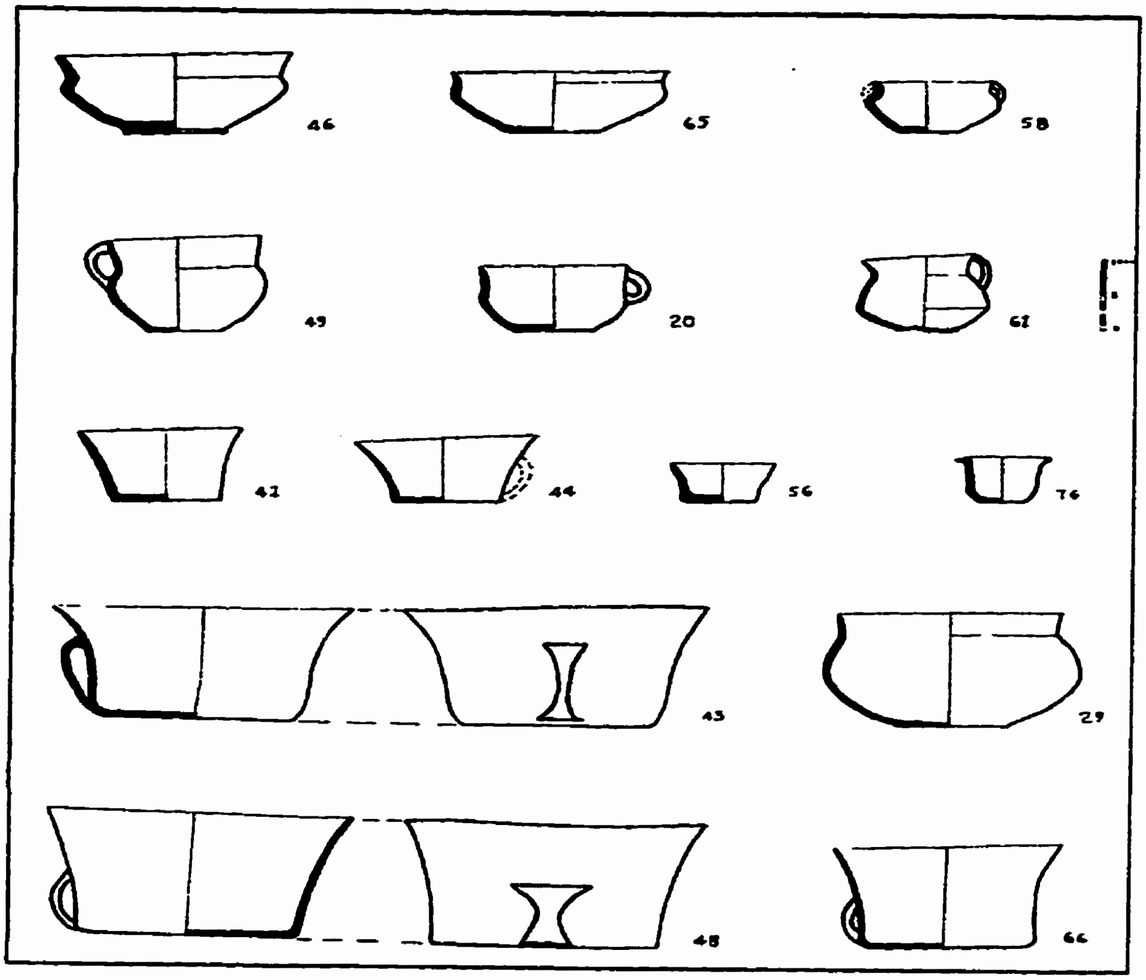


Illustration 8.15. Type of bowls (46, 65), pithoi (29), and cups (58, 49, 20, 61, 41, 44, 56, 76, 43, 48, 66) used in the Zarkou cemetery. After Gallis 1982:Fig. 13

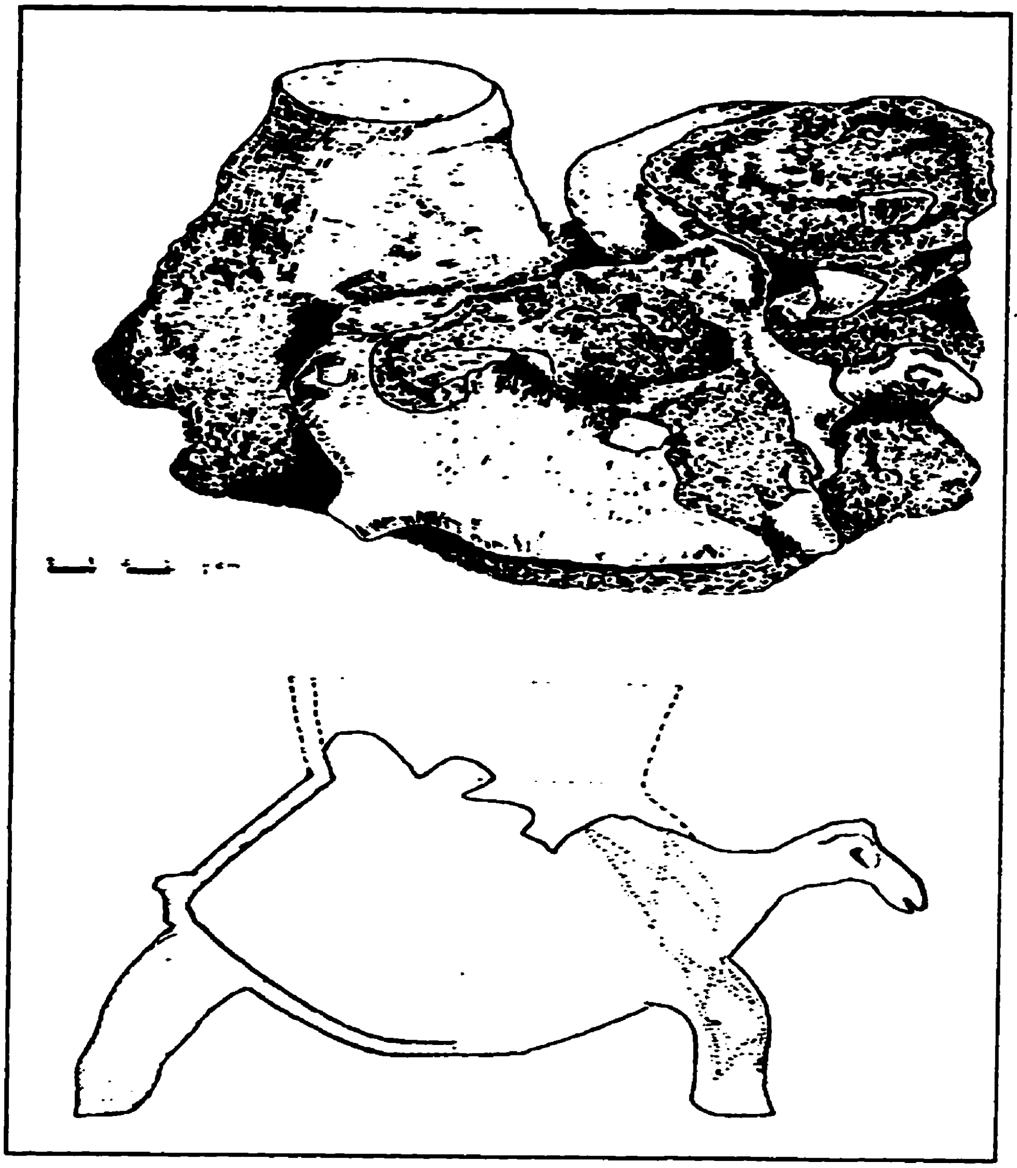


Illustration 8.16. Upper: *Burial T24a (juvenile) with zoomorphic vase as found* in situ. Lower: *schematic of the zoomorphic vase. Source: Gallis 1982: Fig. 17.*

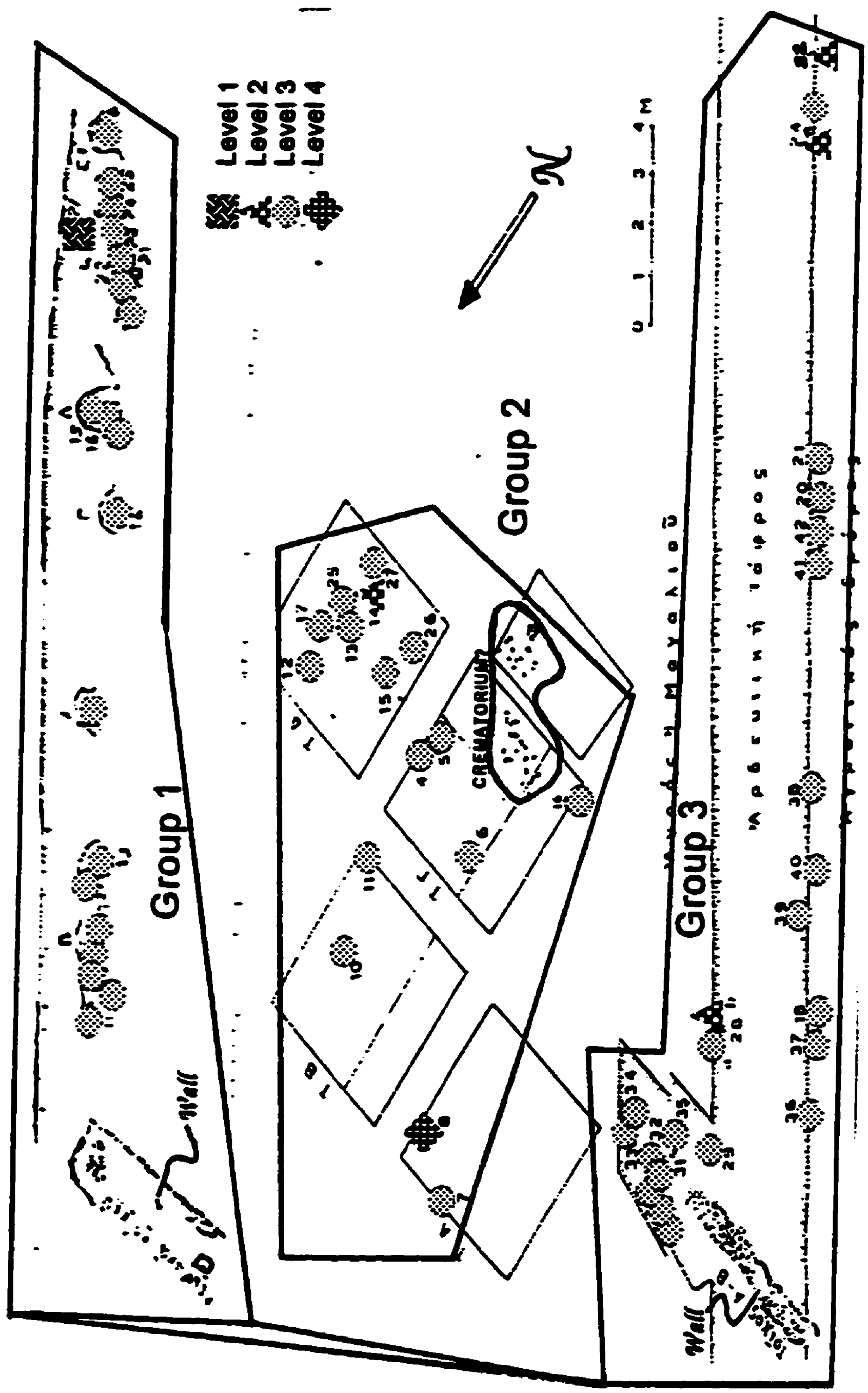


Illustration 8.17. Spatial distribution of ranking in the Zarkou cemetery.

CHAPTER 9

THE FINAL NEOLITHIC

I. Introduction to the Final Neolithic Material Culture

The Final Neolithic is unique because it has only recently been distinguished from the Bronze Age and the Late Neolithic phase. As a consequence, the temporal terminology used for the phase remains confusing. It has been variously called the "Late Neolithic" (Treuil et al. 1989), the "Late Neolithic II" (Coleman 1993; Sampson 1988; Zachos 1987), the "Chalcholithic" after the Balkans terminology, the "Early Bronze Age I" because of the unsure stratigraphy at Pevkakia, and "Final Neolithic," particularly for southern Greece (Renfrew 1973; Diamant 1974; Phelps 1975).

At this time, I prefer to use the term "Final Neolithic." The main reason is climatic, where the term is used to differentiate between Temporate Europe and the Mediterranean climate of Greece. This distinction does not, however, differentiate the Greek Final Neolithic material culture from the cultures of the Balkan Chalcholithic period. The archaeological differences and similarities between lands in the modern political boundaries of Greece and to the north of this in the Balkans will be alluded to below.

The Final Neolithic is a unique time because very clear differences between Northern and Southern Greece develop. From the evidence of ceramic interaction spheres, it is apparent that settlements in the two areas adopt very different relationships with neighboring groups during this time. In the South, there are distinct cultural zones, intensively interacting, while in the North, Macedonia, Thrace, and Thessaly develop a more intense relationship with the cultures of the Balkans. During this phase Northern Greece is more clearly related to the Balkans and "North" is used as a proxy for this association. Therefore, intense, spatially differentiated interaction spheres and regional uniqueness characterize the Final Neolithic phase.

A. Settlement Pattern and Architecture

Within these different regional groups, there are also distinctly different settlement patterns. In the south and in the islands during the first half of the FN, there is an increase in the number of sites occupied. These sites are small, and include an increase in the use of caves (Diamant 1974; Wilkens 1986). It is also interesting that most of the new sites identified through surface survey in Boeotia (Bintliff and Snodgrass 1985), Euboea (Sampson 1981), the Berbati-Limnes region of the Argolid (Well et al. 1990) and the southern Argolid (Runnels and van Andel 1987) date to the Final Neolithic. The settlements themselves do not really change in plan from previous periods; small houses predominate and they are spaced very close together (an agglomerative plan). However, they are now commonly scattered across the hillsides (Demoule and Perlés 1993:399), with each house having its own storage pits and hearths. Several authors have argued that this pattern suggests that a seasonal, pastoral economy came to dominate the subsistence strategy (Diamant 1974; Zachos 1987; Wickens 1986). It has also been argued that caves were used as temporary pens for sheep by the transhumant herders (Kitsos, Tharrounia, Ayia Triada, Marathon, Agios Petrochoros, Fournospilia, Hagios Nikolaos, Klaythies, etc.; cf. Demoule and Perlès 1993:399). However, the faunal evidence does not support such a hypothesis. Further, Diamant (1974) has observed that access to many of these caves is difficult (i.e., semi-mountainous areas), and some are far from water sources. The use of these sites as shepherd's camps is therefore problematical.

This shift in settlement pattern to small "farmsteads" or "hamlets" placed in more marginal landscape areas (particularly in terms of agricultural land) is thought to be a response to a dramatic increase in population and a continuing trend in the dispersion of settlements (particularly in the Argolid; Runnels and van Andel 1987). A similar pattern is found in the Balkans during this time (Greenfield 1986). Progressive hierarchical differences between settlement size and richness has been documented for the Argolid (Runnels and van Andel 1987) from the Final Neolithic to the Early Bronze Age. This dispersion and disparity between settlements is thought to have been the result of several factors, all linked to agriculture. Wells' study (Wells et al. 1990) has suggested that this change came when subsistence strategies shifted from spring-fed to rain-fed irrigation techniques. In the same time, the use of less demanding crops has been documented in the south (barley and legumes). Barley dominates crops of this period, especially in the south (Francthi: Hansen 1991) and the islands (Zas Cave, Naxos: Zachos 1990). Soil erosion is another factor that has been considered, and is thought to have been caused by the settlement on the hillslopes (Well et al. 1990; Zangger 1991). It seems that settlements in the south needed to adopt strategies which would produce food quickly and independently. The establishment of smaller settlements farther away from the primary settlement, would also suggest that a larger catchment area was needed to sustain the growing local population. The appearance of small houses throughout the countryside, to be used only for seasons of farming is not unprecedented in Greece, as there has been several ethnographic documentation of such strategies in the modern and recent historical periods (Pelapsis and Thompson 1960; Kolodny 1974; McGrew 1985; Sutton 1991, 1994; Fowler 1995).

In the north a different pattern emerges. In Thessaly, there is a dramatic drop in the number of sites occupied during the FN (Gallis 1989). There are few new sites, and those that are occupied are quite large and unevenly distributed across the region. The precise reason for this has not been suggested: it could be due to a decrease in population or just a continuing nucleation process where most people are rapidly moving into the larger settlements (Demoule and Perlés 1993:401).

From another perspective, though, the two patterns are clear. In times of economic prosperity and freedom from crisis, it is likely that the settlement pattern will show spread from a settlement.[1] This is called a dispersed settlement pattern, and characteristically has small settlements surrounding a larger one (Fowler 1995:70-74; Sutton 1991:401). This seems to be the case in the south and the islands during the FN. On the other hand, in times of economic problems, or some type of crisis, the outlying settlements are abandoned, and people start moving back into the larger centre, often packed into small, closely spaced houses (Fowler 1995:70-74; Sutton 1991:401), as occured intensively in Thessaly (Wace and Thompson 1912). This nucleated settlement pattern appears to be taking place in northern Greece during the FN. However, contrary to the observations Demoule and Perlès (1993:401), this pattern does not appear in eastern Macedonia and the Balkans during the last half of the FN (Greenfield 1986), when many of the large tell sites in Thessaly that were inhabited in the first half of the FN are abandoned.

Further evidence for nucleation of settlements, and particularly due to a crisis situation of some sort, comes from the settlement architecture in the north. At the largest sites in the north, Pevkakia in southern Thessaly (Schachermeyr 1976) and Mandalo in western Macedonia (Pilali-Papasterio and Papaevthimiou-Papanthimou 1989) there are massive surrounding walls. At Otzaki, in northern Boeotia, there is also a extensive ditch, some 6 m deep and 4.5 m wide (Milojcic 1955). These walls and the ditch appear different from those seen earlier at Dhimini and Sesklo, simply because of their massive size. It does not look like they were built to symbolically separate the inner village from the outer village; these were built simply to keep something out. What exactly this was, has yet to be explained.

Demoule and Perlés (1993:401) have also noted that there does not seem to be any obvious economic reason for the decrease in site density. Again, there is not a "secondary products revolution" notable in the FN (Halstead 1987; Hansen 1988; Greenfield and Fowler, in prep), and no increase in viniculture (Runnels and Hansen 1986). It has been suggested by Demoule and Perlés (1993:403) that this decrease may be due to some social crises, as Thessaly became weaker in the exchange network during the FN. It is hoped that this interesting observation can be clarified with a better understanding of changes in society.

B. Technology and Crafts

The domestic equipment used in the FN remains abundant and varied. Similar to many other sites, Rachmani for example, has numerous areas for grain storage, many coarse pots, grinders, milling stones, celts, flaked stone tools, bone tools, and more spindle whorls (Wace and Thompson 1912) (Illus. 9.1). Wild animal skins also are still used at Pevkakia (Hinz 1979), but it is with weaving and matting where the greatest increase is found. Impressions on sherds are far more common in this phase than any other, and some eight sites show that weaving and matting was very commonplace.[2] From Kephala, we find that four techniques were used for matting and weaving: a simple twine, a split twine, a plain weave, and coiled matting (Illus. 9.2). A study by Carrington Smith (1977) has shown that fine grasses were widely used; plant fibers were used as warps, while reeds and grasses were used as weft. At Tharrounia and Kephala both, evidence for either fine linen or wool (which is uncertain at this point) and plain woven cloth has also been found. And, uniquely, at Kephala, cloth was built into the coarse pottery walls, probably as a means of support (Demoule and Perlés 1993:401).

Compared to the pottery of earlier phases, the Final Neolithic wares seem quite inferior in quality (Illus. 9.3.). Coarse wares dominate types throughout Greece during the FN, and, with the exception of Macedonia, painted wares are few and often have sloppy decoration (Demoule and Perlés 1993:401). With the Final Neolithic styles one finds a greater variety of coarse tempering materials being used for the coarse vessels. Slips are rarely used on these styles, and only light burnishing characterizes most surface treatments (Diamant 1974; Phelps 1975; Zachos 1987). On this mainly "domestic" pottery, several other simple surface decorations characterize FN wares: like most of eastern and central Europe at this time, crusted ware is produced in Greece; simple geometric motifs were produced using a combination of white, reddish, and sometimes black paints; and there was also infrequent use of incisions and plastic decoration on large, coarse vessels (Demoule and Perlés 1993: 401).

Different modes of procurement and manufacture have been cited as reasons for similar decline in stone tools production (Demoule and Perlés 1993:401-402). One can infer from this that there was a lack of specialists involved in the procurement and manufacture of lithics during the FN. The most diagnostic of stone tools in the FN are the rare, fine, elongated obsidian arrowheads (Illus. 9.4). These are found throughout Greece, but never in large numbers, and since an exact same type is found in the Gulmenitsa and Salcutsa cultures of the Balkans, there is some question if the triangular points were even manufactured in Greece (Demoule and Perlés 1993:402).

Copper artifacts dating to the FN are more common than in previous periods, and along with the rare gold and silver artifacts, are always found as finished objects. The ongoing excavations at Zas Cave on Naxos (Zachos 1990), have yielded some of the most impressive metal finds of this phase. Still, other sites from around the Aegean, like Kephala (Coleman 1977), Giali (Sampson 1988), and Sitagroi III (Renfrew 1986), all show evidence that indicate smelting may have occurred at these sites (Illus. 9.5). As noted in Chapter 5, the discovery of ore sources which may have been exploited during the Neolithic (especially silver-rich lead ores; Gropengiesser 1986; Zachos 1990; Coleman 1977), has at least brought attention to the availability of the ores for manufacture.

C. Trade and Exchange

Perlés (1990) has show recently that two regions in the Aegean acted as principle centers for production and artifact distribution during the FN. Perlés suggests that the central region of southern Greece and the islands were key places in the FN exchange system. Most of southern Greece seems to have been neglected in this trade network, and even more so Thessaly, whose position appears quite understated from previous phases (Demoule and Perlés 1993:403). In almost all cases it was the Cyclades that acted as the main place of production for "prestige" goods, such as metal objects, jasper points, *spondylus* ornaments, marbles vases, and figurines. On the mainland, in the south, Lavrion and Siphnos are key in the production and trade of metal objects during the FN (Perlés 1990). As Demoule and Perlés have noted (1993:403), sites which were once prosperous in trade became less so in the FN economy, and this may have brought about severe social changes, particularly in ways social ranking was symbolized. It is to this question of social differentiation in the Final Neolithic that we now turn.

II. Analysis of the Final Neolithic Mortuary Remains

The Final Neolithic sample of mortuary remains includes data from three sites: the FN deposits at Franchthi Cave; the cemetery at Kephala on Kea; and Tharrounia on Euboea. Tharrounia and Kephala are two of the best documented Neolithic cemeteries in Greece. The sample from FN deposits at Franchthi is small, but it does demonstrate the program of disposal at the site. The FN sample from Franchthi is also important because it allows developments in mortuary differentiation to be traced at Franchthi over time.

A. Franchthi Cave

1. Formal Treatment

The FN mortuary sample at Franchthi is composed of seven individual interments. All interments were found in the Paralia area (Illus. 9.6). As with the burials from previous phases, none of the grave dimensions were recorded by the excavators, and pits are again assumed to have held the skeletal remains (Cullen, personal communication). Therefore, neither the grave type, shape, or dimensions are listed in the descriptions below (Table 9.1). There is no indication that any burial facilities had elaborate construction features.

Fr #	Facility	InterForm	Location	Posture	Orientation	PBA*	Scenario	Age-Sex
18.1	indet.*	Inhumation	Paralia	right side	indet.	bone scatter	single	subadult male
19	Pit?	Inhumation	Paralia	right side	indet.	indeterminate	single	adult female?
61	indet.	Inhumation	Paralia	right side	indet.	disarticulated	multiple	adult female
62	indet.	Inhumation	Paralia	right side	indet.	disarticulated	multiple	adult male
63	indet.	Inhumation	Paralia	side unknown	SE-NW	disarticulated	single	adult female??
69	Pit?	Inhumation	Paralia	right side	indet.	indeterminate	single	juvenile male?
115	indet.	Inhumation	Paralia	right side	indet.	disarticulated	single	juvenile

*Table 9.1. Desciption of the FN burials at Franchthi Cave. *PBA=pattern of bone association, ** indet.=indeterminate.*

a) Preperation and Treatment

There are two types of interments on the Paralia. Most interments are single, inhumation burials. There is, however, one example of multiple burial, including an adult female and male. Most of the interments were disturbed, and there is little indication of body orientation or the original pattern of bone association (PBA). All bodies appear to have been placed on their right side. However, posture was not determinable for one interment. From this limited data, there is little variation observable in the preparation and treatment of the body. Further, it would only be speculation to suggest that secondary burial was practiced during the FN at Francthi. For this reason, all burials are tentatively regarded as primary inhumations.

2. Age and Sex Distribution

The FN mortuary population at Franchthi is characterized by a deficit of infants, and neonates (Table 9.2). Females compose over half the mortuary population, while males makeup less than one third. However, only one of these males is of adult age. The age distribution is dominated by adults, and there are only slightly more juveniles than subadults represented. The lack of any identified neonates or infants in the sample cannot suggest a low or insignificant infant mortality rate. As suggested by Jacobsen (1984), this society was most probably composed of semi-nomadic pastoralists. This suggests that other disposal areas were used by the society, such as at other locations in their territory of exploitation.

	Neonate	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	1	0	1	2	28.57%
Female	0	0	0	1	3	4	57.14%
Unidentified	0	0	1	0	0	1	14.29%
Total Count	0	0	2	1	4	7	
% of Total	0.00%	0.00%	28.57%	14.29%	57.14%		100.00%

Table 9.2. The age and sex distribution of the FN Franchthi mortuary population.

3. Artifact Occurrence

Only females had goods deposited in the graves. One adult, possibly a female (Fr. 19), had a terracotta spindle whorl included in the interment. In another adult female burial (Fr. 63) to the north of Fr.19, a crusted ware vessel was included. The utilitarian nature of these gifts suggests that they were only technomic, and held little signficance as markers of vertical status.

Date	Fr #	Class	Type	Age-Sex
FN	19	Terracotta	spindle whorl	adult female?
FN	63	Pottery	crusted ware	adult female??

Table 9.3. The distribution of burial gifts in the FN Franchthi burials.

4. Spatial Distribution

Because of a lack of data on the preparation and treatment of the body and the grave, spatial distinctions were difficult to determine for the disposal area. The only obvious spatial distinction is the location of the non-adult burials (Illus. 9.6). The juveniles and subadult male were buried in relative isolation from the adult interments. Adult interments to cluster together in trench O5. One adult female was buried in trench Q5. This female may have some association with the juveniles buried to her west in trench Q6. As well, the group of adult interments in trench O5,may be grouped together for reasons of kinship affiliation, rather than for reasons of age. However, the distinct seperation between adult and non-adult burials shows that individiuals of different age were not grouped together. Given the paucity of data, however, the means of this spatial distinction is not readily apparent.

	Microlocation					
Age-Sex	O5 NE	PQ6	Q5	Q6	?	Grand Total
adult female	1	0	0	0	0	1
adult female?	0	0	1	0	0	1
adult female??	1	0	0	0	0	1
adult male	1	0	0	0	0	1
subadult male	0	1	0	0	0	1
juvenile	0	0	0	1	0	1
juvenile male?	0	0	0	0	1	1
Grand Total	3	1	1	1	1	7

Table 9.4. The spatial distribution of FN Franchthi interments by age.

The underrepresentation of infants, neonates, and males in this mortuary population also demands explanation. There are two possibilities for the lack of these age and sex groups. First, the individuals may have been buried in a yet unexcavated area of the Paralia or Cave. Second, they were buried at a different settlement location. Considering the extensive excavation of this site, the second possibility is more probable. As a result of chance, rather than due to the directives of dispoal at Franchthi, males, infants, and neonates did not die during the occupation of the site (cf. Jacobsen and Cullen 1981). If the site is seasonal, as Jacobsen (1984) suggests, than we should expect the burials of these individuals to be found at another site in the region. However, the only comparative data that could be used to establish commonality would be the evidence of female mortuary treatment. Therefore, female burial would have to present at these sites, as well as male burials. As this point, there is no site which may be considered a candidate for this comparison.

5. Mortuary Differentiation and Social Distinctions

a) Normative Mortuary Treatment

Normative treatment at FN Franchthi Cave is characterized by primary inhumation burials. The one example of multiple interment is non-normative treatment. There appears to have been little modification to the body during mortuary ritual, and there was no elaboration to the graves. The abundance of pottery in the Paralia (Jacobsen 1979) may have had some function in the mortuary ritual and treatment of the dead, but this is speculative. Gifts given to individuals are rare in this disposal area, and only utilitarian items were given to adult females. These goods were locally manufactured and a local technomic function for these goods is most likely. The lack of grave goods, and the absence of any trade items in the burial assemblage, is congruent with Perlès' (1990) analysis of trade and exchange during the FN. The sites in this region (the Argolid) were not part of the elaborate trade network during the FN phase. This also makes it unlikely that any social distinctions would have represented by valued goods (trade or precious items). Social distinctions, are, therefore, more likely to be archaeologically visible in the horizontal dimension.

Feature	Variable	Normative Treatment
Burial Facility	Facility Type	pit
	Shape	indeterminate
	Avg. Volume (m^3)	indeterminate
	Floor	earth or bedrock floor
	Formal Disposal Type	disposal area/ intramural??
	Special Features	walls
Preperation and Treatment	Age-Sex Categories	no infants/neonates
	Interment Type	inhumation
	Posture	right side
	Orientation	disturbed
	PBA	disturbed
	Cultural Modification	none
Burial Scenario	Interment Form	single burial
	Ritual Process	primary burial
Burial Goods	Raw Material	terracotta/ceramic
	Source	local
	Distance	<100 km
	Manufacture	local
	Function	local technomic

Table 9.5. The normative mortuary treatment represented by the FN Franchthi burials.

b) Social Distinctions

The mortuary activity at FN Franchthi does not allow many social distinctions to be proposed with confidence. Overall, two horizontal social distinctions and one special distinction may be suggested. The utilitarian items of the adult females imply that these symbolize occupational membership. A study of the skeletal remains has yielded bone pathologies suggestive of the occupational activities of women (Jacobsen and Cullen 1981:94), which, at Franchthi, generally include potting, weaving, and food preperation. Age statuses may also be represented by spatial location. The segregation of individuals according to age, suggests that prohibitive directives required adults to be distinguished from non-adults. A special status distinction may be represented by the multiple burial. Even though the sample size is small, the practice of multiple interment must be considered an alternative mortuary treatment. This is the only case of mulitiple interment during this or any other Neolithic occupational level at Franchthi. As Jacobsen and Cullen (1981) have noted, double burials are often thought to contain consanguinal pairs. However, the lack of adult males in this mortuary population does not allow this impression to be subjected to repeated testing.

Social Distinction	Number	Age	Sex	Formal/Symbolic Differentiation	Artifact Differentiation	Comments
Horizontal Distinctions						
Occupational Membership	2	Adult	Female		Crusted ware/ spindle whorl	
Age Status	3	non-adult	?	location of grave	no goods	isolated
Special Status Distinctions?						
Alternative Treatment	2	Adult	Male/Female	multiple interment	no goods	

Table 9.6. The dimensions of social distinctions represented at FN Franchthi Cave.

B. Kephala, Kea

1. Introduction to the Site

The site of Kephala is located on a headland on the northwest coast of the Cycladic island of Keos, off the southeast coast of Attica (Illus. 9.7). Excavations at Kephala were undertaken by the University of Cincinnati, headed by John E. Coleman (1977). Coleman's excavations revealed a Final Neolithic settlement and cemetery. The cemetery is the first highly organized, built cemetery known in the Aegean, and therefore,is of considerable importance. The cemetery itself was divided into Upper and

Lower parts, with built graves for multiple interments successively built one on top of the other (Illus. 9.8a and 9.8b). This cemetery is unparalleled in the Neolithic and deserves further investigation than that given it in the field report.

Investigation of the skeletal material of over 60 individuals was conducted by J. Lawrence Angel (1977:Appendix 5). These remains represent the largest and best preserved sample known from the Neolithic period in Greece, with the exception of the EN site of Nea Nikomedia which has never been fully published. The report in Coleman (1977) is an excellent example of Angel's later work, where he focused attention on issues of human osteology, pathology, and skeletal preservation, rather than the racial classifications that characterize his earlier work (Jacobsen and Cullen 1990:41-42). This sample also provides us with great potential for insight into the society of this settlement and a picture of the trajectory of regional social development being studied in this thesis.

2. Formal Treatment

a) The Mortuary Facility

A large number of the graves at Kephala could be classified into a specific type of burial facility (n=39; 97.5%) (Table 9.7). The mortuary facilities at Kephala fall into three main categories: 1) built graves; 2) cist graves; and 3) pit graves. The built graves are the most common and compose almost 90% of the sample. Pit graves are the next most common at 7%, and only one cist grave is found in this cemetery (3%) (see Illus. 9.9).

Grave	Type	Shape	L	W	D	Vol.	Floor	Walls	Interior	Platform	Disposal Feature	Mesoloc
1	built	circular	1.05	0.75	0.60	0.47	pebbles	moderate/large	none	Unknown	not bounded	LC-central
2	cist	rectangular	0.32	0.30	0.20	0.02	indet.	not determinable	slab lined	Unknown	not bounded	LC-central
3	built	rectangular	1.00	0.65	0.85	0.55	pebbles	moderate/large	none	Present	not bounded	LC-central
4	built	circular	1.00	0.80	0.50	0.40	indet.	moderate/large	none	Present	not bounded	LC-central
5	built	rectangular	0.80	0.70		0.56	indet.	moderate/large	none	Not present	not bounded	LC-central
6	built	circular	1.08	0.96	0.45	0.47	indet.	moderate/large	none	Not present	not bounded	LC-central
7	built	rectangular	1.13	0.97	0.75	0.82	sand	moderate/large	none	Unknown	not bounded	LC-central
8	pit	circular				0.00	indet.	small/moderate	none	Not present	not bounded	LC-central
9	built	circular	0.96	0.72	0.45	0.31	indet.	large	none	Present	not bounded	LC-central
10	built	rectangular	1.04	0.76	0.50	0.40	indet.	moderate/large	none	Present	not bounded	LC-central
11	built	circular	1.00		0.50	0.50	indet.	moderate/large	none	Not present	not bounded	LC-central
12	built	circular	0.93		0.30	0.28	indet.	moderate/large	none	Present	not bounded	LC-central
13	built	rectangular	1.23	0.70	0.48	0.41	indet.	large	none	Present	not bounded	LC-central
14	built	rectangular	1.22	1.05	1.00	1.28	pebbles	moderate/large/ plaster	slab lined	Unknown	not bounded	LC-central
15	built	rectangular	1.23			1.23	pebbles	moderate/large	none	Unknown	not bounded	LC-central
16	built	rectangular	1.14	0.70		0.80	indet.	moderate/large	none	Unknown	bounded	LC-central
17	built	circular	0.57	0.49	0.35	0.10	indet.	small/moderate	none	Unknown	bounded	LC-central
18	built	rectangular	0.46	0.35	0.42	0.07	indet.	small/moderate	none	Unknown	bounded	LC-central
19	built	circular	0.67	0.36	0.20	0.05	indet.	small/moderate	none	Not present	not bounded	LC-central
20	built	rectangular	0.14	0.11	0.35	0.01	pebbles	moderate/large/ plaster	none	Unknown	not bounded	LC-eastern
21	built	rectangular	1.05			1.05	indet.	not determinable	none	Unknown	not bounded	LC-eastern
22	built	circular	0.42			0.42	indet.	small/moderate	none	Not present	not bounded	LC-eastern
23	built	triangular	0.42	0.29	0.25	0.03	pebbles	not determinable	slab lined	Not present	not bounded	LC-eastern
24	built	circular	0.12	0.80	0.45	0.04	indet.	large	none	Not present	not bounded	LC-eastern
25	built	rectangular				0.00	indet.	moderate/large	none	Unknown	not bounded	LC-eastern
26	built	rectangular				0.00	slabs/ foundation	moderate/large	none	Unknown	not bounded	LC-eastern
27	built	rectangular	0.50	0.30	0.15	0.02	pebbles	moderate/large	none	Not present	not bounded	LC-eastern
28	built	rectangular				0.00	indet.	small/moderate	none	Unknown	not bounded	LC-western
29	built	indeterminate				0.00	indet.	small/moderate	none	Unknown	bounded	LC-western
30	built	rectangular	0.72			0.72	indet.	large	none	Unknown	not bounded	LC-western
31	pit	depression				0.00	indet.	not determinable	none	Unknown	not bounded	LC-isolated
32	pit	depression				0.00	pebbles	small/moderate	none	Not present	bounded	UC-western
34	built	rectangular	0.97	0.65		0.63	indet.	moderate/large	none	Unknown	bounded	UC-western
35	built	circular	1.05	0.72	0.40	0.30	indet.	moderate/large	none	Present	bounded	UC-western
36	built	circular	0.73	0.53	0.45	0.17	indet.	moderate/large	slab lined	Present	bounded	UC-western
37	built	circular	0.79	0.69	0.50	0.27	indet.	small/moderate	none	Not present	bounded	UC-eastern
38	built	indet.	0.12			0.12	indet.	small/moderate	none	Unknown	bounded	UC-eastern
39	built	circular	1.58	0.60	0.60	0.57	indet.	moderate/large	none	Not present	bounded	UC-eastern
40	built	rectangular	?	?	?	0.00	indet.	moderate/large	none	Unknown	bounded	UC-eastern

Table 9.7. Description of the burial facilities at Kephala. LC=Lower Cemetery, UC=Upper Cemetery.

Built graves are characterized by their shape, size, and unique construction. Built graves are either circular (40%) or rectangular (51%) in shape, but one is of triangular shape. The grave of triangular shape (K23) was built in the niche between a wall and Grave K24. Perhaps its location is largely responsible for its unique shape. Only two of the built graves did not have a determinable shape (K30, K40). However, from the open location and preserved walls, it is probable that they were rectangular.

The dimensions of built graves vary more so than the other graves. Their length ranges from 0.8 to 1.58 m, their width from 0.29 to 1.10, and their depth from 0.15 to 1.0 m. The built graves are also the largest on average of the three types of graves. One finds the architectural features of the built graves also unique. Built grave floors in some cases are pebbled, have slab foundations, or are composed of a layer of sand packed on the bottom of the grave. The walls of the graves are mainly built with moderate or large stones (71.4%), and in two cases the walls were covered in a plaster. A small number of these graves had a slab lining like the cist graves. Covering slabs are also quite common on the built graves. Although not completely preserved in all cases, about 87% of the built graves are thought to have had covering slabs. Built graves are the only type that have platforms built over the covering slabs. The function of these platforms is of some interest and will be a subject of later discussion.

The *pit* graves are quite limited in their shape and construction features. Only one pit was circular, and the other two were refined depressions in the bedrock. The dimensions of the pits are undetermined, as they were badly eroded. Coleman (1977) did not report dimensions for these graves. One of the pits was lined with small pebbles, and the others had small to moderate stones lining of what remained of the pit walls. As well, all three pits had stones covering the grave, although these were disturbed from their original positions.

The single *cist* grave is unique amongst the grave types at Kephala. It does however share some construction features in common with the other graves. The cist grave is rectangular in shape and is not large, measuring roughly 0.3 m in length and width. It is also quite shallow with a maximum depth of 0.2 m. The interior of the grave was lined with single slabs of limestone, and probably had a cover, which was not completely preserved.

b) Preparation and Treatment of the Body

It is estimated that there was a minimum of 70 individuals buried over the lifespan of the Kephala cemetery (Table 9.8).[3] The practice of burying single individuals in graves is the least common practice at Kephala (30% of cases). Most graves hold more than two people (70%). The largest number of people buried in one facility was 13 individuals (19% of MNI). Individuals buried in multiple interment facilities were buried in layers. The layer separating smaller groups of interments often consisted of a combination of earth and pebbles. Grave 7 had the largest number of persons buried in three layers (n=13), but this was not the largest grave at Kephala.

There is little variation in the interment types at Kephala. All interments are inhumations (93%), with a modification on this theme in the form of jar burials for infants. The Kephala mortuary program is, however, not completely homogeneous. The posture of the body in the grave is largely indeterminable, as 80% of the graves were disturbed substantially enough so orientation data was not recorded. However, in graves where the body position was more preserved, some variation was noticeable. Individuals were buried in one of four positions: on their right side (5.7%); on their left side (4.3%); one individual was found prone (1.4%); and another on their back (1.4%). Again, due to preservation, the orientation of most individuals could not be determined (76%). Of those preserved, most individuals seem to be oriented in a westerly fashion (73%). The others are oriented in an easterly direction (18%), and in one case, the person was directed south to north.

As was indicated above, most burials were disturbed, leaving little trace of the original pattern of bone association. It was, however, possible to determine the pattern of bone association for several individuals. A small proportion of these (10%) were recorded as having the body in flexed position. Two further individuals were placed extended in the grave, and several others were clearly disarticulated and not disturbed. There is some connection between the pattern of bone associated and how many individuals were buried in the grave. Only the individuals in the lower layers were disarticulated, but not otherwise disturbed by post-depostion factors. This suggests that the disarticulated individuals were disturbed somewhat by later inhumations. It is probable that the minor destruction of the earlier interments had been repaired. The shallow level of the graves and the thin layer of sand and pebbles separating the interments supports this observation.

The bodies of the dead at Kephala were not modified in any significant way prior to interment. Coleman (1977) notes that there is a possible burnt bone, but this was never clarified any further. The burnt bone may have showed staining as a result of soil pH levels, which is often mistaken for burning (cf. Greenfield and Fowler, in preperation).

Grave	Skel #	Posture	PBA	PBA/ Posture	Orientation	Age-Sex	Mesoloc	Pathology
1	1.11	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
1	1.12	disturbed	scatter/fragments	dist/frags	disturbed	subadult female	LC-Central	none
1	1.21	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
1	1.22	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Adult	LC-Central	none
1	1.31	right side	flexed ("fetal")	right/flexed	W-E	adult male	LC-Central	dental lesions
1	1.32	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	right tibia retroversion
2	2	left side	flexed ("fetal")	left/flexed	NE-SW	undiff infant	LC-Central	none
3	3.11	disturbed	scatter/fragments	dist/frags	disturbed	undifferentiated	LC-Central	none
3	3.21	right side	flexed ("fetal")	right/flexed	SW-NE	adult female	LC-Central	vertebral arthritis
3	3.22	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Adult	LC-Central	none
4	4	right side	flexed ("fetal")	right/flexed	W-E	adult male	LC-Central	dental lesions
5	5	unknown	scatter/fragments	un/frags	unknown	undifferentiated	LC-Central	none
6	6	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	jaw seperation
7	7.11	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
7	7.12	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
7	7.13	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
7	7.14	disturbed	scatter/fragments	dist/frags	disturbed	undiff infant	LC-Central	none
7	7.15	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
7	7.16	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
7	7.21	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	dental lesions
7	7.22	disturbed	scatter/fragments	dist/frags	disturbed	undiff infant	LC-Central	none
7	7.23	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
7	7.24	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	vertebral arthritis
7	7.25	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
7	7.31	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
7	7.32	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
8	8	disturbed	disarticulated	dist/disartic	disturbed	undiff infant	LC-Central	none
9	9.11	right side	flexed ("fetal")	right/flexed	NW-SE	adult female	LC-Central	none
9	9.12	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
10	10	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
11	11	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	piercing wound
12	12.1	disturbed	scatter/fragments	dist/frags	disturbed	subadult female	LC-Central	none
12	12.2	disturbed	scatter/fragments	dist/frags	disturbed	undiff infant	LC-Central	none
13	13.1	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
13	13.2	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none

Table 9.8. *Description of the preparation and treatment of the body at Kephala.*

Grave	Skel #	Posture	PBA	PBA/ Posture	Orientation	Age-Sex	Mesoloc	Pathology
14	14.1	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
14	14.2	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
14	14.3	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
14	14.4	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	none
14	14.5	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	bowed humerus
14	14.6	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-Central	none
16	16.1	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-Central	vertebral arthritis
16	16.2	disturbed	scatter/fragments	dist/frags	disturbed	subadult female	LC-Central	none
16	16.3	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Juvenile	LC-Central	none
16	16.4	disturbed	scatter/fragments	dist/frags	disturbed	juvenile male	LC-Central	none
18	18	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Juvenile	LC-Central	none
19	19	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Juvenile	LC-Central	none
20	20.1	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-East	ankle flexion facets worn
20	20.2	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-East	none
20	20.3	disturbed	scatter/fragments	dist/frags	disturbed	adult male	LC-East	trephination?
20	20.4	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-East	none
20	20.5	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-East	none
20	20.6	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-East	olecranon peforation (third trochanter)
20	20.7	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-East	none
20	20.8	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Adult	LC-East	none
20	20.9	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Juvenile	LC-East	none
22	22	disturbed	scatter/fragments	dist/frags	disturbed	Undiff Juvenile	LC-East	none
23	23	disturbed	disarticulated	dist/disartic	unknown	undiff infant	LC-East	none
24	24	disturbed	scatter/fragments	dist/frags	disturbed	adult female	LC-East	none
25	25	disturbed	disarticulated	dist/disartic	S-N	adult male	LC-East	none
26	26	disturbed	disarticulated	dist/disartic	E-W	adult male	LC-East	none
27	27	unknown	scatter/fragments	un/frags	unknown	Undiff Juvenile	LC-East	none
31	31.1	unknown	scatter/fragments	un/frags	unknown	undiff infant	LC-Isolated	thalassemia/sickle -cell anemia
31	31.2	unknown	scatter/fragments	un/frags	unknown	undiff infant	LC-Isolated	thalassemia/sickle -cell anemia
32	32	unknown	scatter/fragments	un/frags	unknown	undiff infant	UC-West	none
34	34	disturbed	scatter/fragments	dist/frags	disturbed	adult female	UC-West	none
35	35	prone	extended (tiba retroversion)	prone/extended	W-E	adult male	UC-West	ankle wound/peridontal disease
36	36	left side	flexed ("fetal")	left/flexed	W-E	adult female	UC-West	porotic hyperstosis
37	37	left side	flexed (legs only)	left/flexed	W-E	juvenile male	UC-East	none
39	39	supine	extended (tiba retroversion)	supine/ extended	W-E	adult male	UC-East	illness (at 3-4yrs)

Table 9.8 con't. Description of the preperation and treatment of the body at Kephala.

Few pathologies were observed by Angel (1977) in the Kephala sample. Over 74% of individuals show no observable pathology. Beyond the few cases osteoarthritis and dental lesions, there are a few peculiar pathologies noted by Angel. One individual showed evidence of piercing wound, but the source is unknown. The skull of another individual shows signs of trauma brought on by piercing with blunt instrument. There are signs of healing around the wound, and the person certainly did not die because of this trauma. This suggests that this wound may be a result of trephination.

One case of thalassemia or sickle-cell anemia was noted by Angel for an infant. It is unknown if this condition was the cause of death, but it would not be unreasonable to suppose. Angel reached this concusions based upon the identification of porotic hyperstosis. Porotic hyperstosis is identifiable by an increased thickness in the hmeatopoetic central layer of the cranial bone. This thickening is a classic bone marker for anaemia of any etiology. One disease, malaria, is often linked to anaemias. Malaria is not uncommon to Mediterraean areas, and is often contracted by populations in close proximity to marshy areas. The headland that makes up Kephala does have a low-lying area to the south, which once may have been an excellent breeding ground for mosquitoes (see central area of Illus. 9.7).

c) Age and Sex Distribution

The age and sex distribution of the individuals buried at Kephala show a skewed distribution (Table 9.9). The majority of individuals are of adult age (69%), with few subadults represented in this population (4%). Juveniles and infants make up the remainder of the population (24%). Due to the nature of the remains only 75% of the sample was ascribed a sex with certainty. Besides the undifferentiated individuals (29%), about 37% of the mortuary population is male, while the remaining 34% is female.

Adult males and females are the most frequent age and sex category in the cemetery (69%). Subadults are disproportionately represented, and all were identified as females (4.29%). There is also a low occurrence of juveniles (11.43%) and infants (12.86%) in the cemetery. If the undifferentiated individuals are divided between the sexes, some estimation of the mortality rate for the (mortuary) population can be calculated. As shown in Table 9.9, by the time individuals reached adult age (>20-25 yrs.) over 99% were deceased; by subadult age 31% of the population was deceased; during the juvenile years 27% of the population had died; and, lastly, infant mortality is relatively low at just over 15.0%. These data show that life expectancy at Kephala was relatively high, as over 70% of the population could have been expected to reach adult age.

	Unidentified	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	2	0	24	26	37.14%
Female	0	0	0	3	21	24	34.29%
Unidentified	2	9	6	0	3	20	28.57%
Total Count	2	9	8	3	48	70	
% of Aged		13.24%	11.76%	4.41%	70.59%	100.00%	
% of Total	2.86%	12.86%	11.43%	4.29%	68.57%	100.00%	100.00%

***Table 9.9.** The age and sex distribution at Kephala.*

There does seem to be some constraint placed upon who was granted interment in the Kephala cemetery. Subadult males are not present in the sample, and may not have been given burial in this cemetery. As well, few juveniles and infants were buried in the cemetery, and no female juveniles were determinable from the skeletal remains. As we will see later, the interment program for these individuals is quite specific.

3. Artifact Occurrence

A narrow range of burial furniture is represented in the mortuary assemblage. Only 48 artifacts are considered burial gifts (Appendix Table 9.1). These gifts are located in the graves, on the platforms or stones covering the graves, and in the contemporary fill just above the graves. There are five principle classes of burial furniture deposited in the Kephala cemetery: 1) bone; 2) wood; 3) terracotta; 4) pottery; and 5) stone. The stone artifacts make up over half of the gift assemblage (52.1%), followed by pottery (27.1%), terracotta artifacts (16.75), wood (2.1%), and bone (2.1%). A large amount of pottery was found in the cemetery area. These artifacts were not included in the analysis because no direct association with any individual or grave unit was certain (see discussion in Coleman 1977).

Nine types of stone artifacts were found in the mortuary assemblage. Obsidian objects dominate the stone artifacts (68%), and the majority of these are blades or scrapers. Other objects include flints tools (12%), three finely made marble vessels (12%; Illus. 9.10), and two so-called "pillow-stones." The heads of two individuals were placed on the stone pillows. The stone artifacts show a high rate of conservation, with 80% completely preserved. Only the obsidian objects were found as fragments or waste. One blade and the marble "rhyton" were somewhat chipped (not purposefully retouched), and the flint "tri-scraper" showed some signs of wear.

In all, five types of pottery were found in the Kephala cemetery. The most common types are incised scoops (Type C1; Illus 9.11) and the large Type A1 jars (Illus. 9.12). Other pottery includes the Type A1 bowl, a small oval bowl, and a cylindrical vessel (Illus 9.13). The quality of the pottery in the cemetery is quite good, with almost half of the vessels found intact (46.2%). Single fragments, partial vessels, and slightly damaged vessels (including a burnt fragment) make up the rest of the sample (30.8%). Two types of painted wares were found amongst the contents of the graves. One type is a "crusted red " ware vase and the other a painted black-on-red ware vessel. These decorated vessels are typical of the pottery styles during the Final Neolithic (see Illus. 9.2).

The terracotta artifacts found at the cemetery are mainly figurines. Three figurines were identified as female, but the sex of two others are unknown because only the heads were discovered. These figurines were pierced and were probably used as necklaces. The remaining terracotta artifacts are thought to be crucibles, supposedly used in metalworking. Although the vessels are fragmented, remains of copper and bronze within the vessels have supported this view.

The only bone artifact found was a tool (worked fragment) made from an *ovicaprid* (sheep/goat) metatarsal. The function of the tool is unknown, and its presence in the mortuary assemblage is unique. Perhaps more peculiar are the decomposed remains of a wooden object, which may once have been a box.

Most of these artifacts appear to have been manufactured locally (43.5%). For many artifacts, though, the exact provenience was not determinable (29.2%). However, some artifacts, such as the obsidian, have been traced to sources on Melos. As well, other artifacts, such as the "scoops," are initially found in northern Greece and might have been imported (Coleman 1977). As well, the black-on-red fragment is diagnostic of the Macedonian and Thracian FN ceramic assemblages, suggesting further contact with the north (cf. Fig. 9.2).

a) Artifact Associations

Only 60% of the individuals were associated with artifacts. Due to the practice of multiple interment, most of the grave inclusions at Kephala could not accurately be assigned to a particular individual. Only 23 (32.8%) individuals were correlated with a particular artifact. Nevertheless, certain constraints can be observed in the distribution and frequency of artifacts in the sample.

Several artifact types are typical of only certain age classes (Fig. 9.1). Adults received the greatest number of gifts (52%), so the types are disproportionately skewed across the adult age category. Adults were accorded two types artifacts: type 1A obsidian blades and Type 6 obsidian tools. Two further types were shared with individuals of younger ages: a type of obsidian blade (Type 1B) was shared with a sub-adult; and female figures were shared with infants. Non-adults had very specific artifacts associated with them. Infants received the large jar for burial, but few other items. The juvenile grave was the only one to have a small oval bowl. As well, only when a juvenile was present did a marble "rhyton" occur. Although interred with an adult male and female, neither the of the adult male or female categories exhibit a marble "rhyton" alone, and this may be specific only to juveniles.

Age	SEX +	SEX -
+	Adult Female 4 Sub-adult Female 1 Infant Male 1	Adult 2 Juvenile 2
-	Female 2	8

Figure 9.1. Artifact types constrained by age and/or sex at Kephala.

The sex of individuals also appears to act as a contraint on artifact distribution (Fig. 9.1). At Kephala, females (35%) received grave goods more often than males (23%). Males and females do share some of artifact types in common, such as obsidian blades (Type 1A), but several itmes are found only with a specific gender. Generally, artifacts considered to be more "utilitarian" or domestic" in function are associated with females, such as the "scoops" and obsidian tools. Males, on the other hand, have no artifacts diagnostic to them. The artifacts associated with adult males seem largely of a symbolic nature. For example, males graves account for 40% of the figurines found in grave context. The remaining 60% are associated with infants or undifferentiated individuals. Only one tool, a flint "tri-scraper" was found in a male grave, and, because of its uniqueness and condition, it may have had a symbolic rather than utilitarian function.

Certain artifacts were also limited to individuals of certain age and sex. Adult females have a large proportion of their assemblage made up of stone (56%) and two pottery types (44%; scoop, bowl Type A1). Sub-adult females only have an obsidian scraper (Type 3). Certain types (bone tool, flint "tri-scraper," obsidian blade 1A) only occur when adult males are in the grave. However, the prescence of these types are singular occurences and cannot be thought of as specific to adult males in general.

b) Frequency-Distribution of Artifacts

The frequency-distribution analysis of the burial furniture in each gravesunit suggests that six categories of "wealth" are represented at Kephala (Fig. 9.2). Most graves had no grave goods (n=16), while the other graves had a range from 1 to 7 grave goods. The distribution resembles a normal regression distribution ratio. However, there are two problems in using a frequency distribution analysis for this cemetery. First, the use of multiple graves in this cemetery does not allow many grave goods to be associated with particular individuals. This affects the distribution of the artifacts, regardless if an algorithim is utilized to smooth the scores. Second, the type of burial gifts buried with the dead should wiegh more considerably in the analysis than the raw frequency. For example, one individual recieved four obsidian points, while another recieved three finely made vessels of stone and clay. Based solely upon the frequency distribution of burial gifts in the Kephala cemetery, a hypothetical distribution of rank levels cannot be confidently suggested.. At the risk of speculation, the present frequency-distribution evidence suggests a maximum of six rank levels at Kephala.

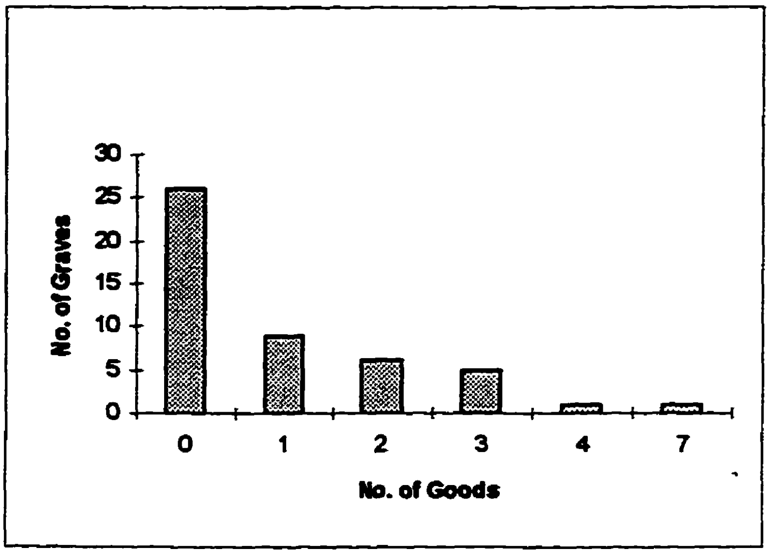


Figure 9.2. Distribution of wealth categories at Kephala.

4. Spatial Pattern at Kephala

The most obvious spatial distinction at Kephala is that the burials are divided into an Upper Cemetery and Lower Cemetery (Illus. 9.8.a, 9.8b). The frequency of burials in each of the areas is uneven. The Lower Cemetery holds the majority of burials (91%), while the Upper Cemetery has very few (9%). Coleman (1977) believes this pattern is a result of the Upper Cemetery being a later addition to compensate for over-crowding in the Lower Cemetery.

The architectual features of the graves are the only significant spatial variation in the cemetery. There are only eight grave platforms at Kephala, and most are found in the Lower Cemetery (75%, n=6). These are confined to the central group of graves. One other platform seperates K34 and K35 in the Upper Cemetery (25%). The other platform (P4; 25%) did not cover any grave, but was built between graves K9, K10, and K12 . It is reasonable to suggest that this particular platform functioned in the preparation and treatment of the body, or some other ritual capacity. Other variation is in the location of grave coverings. Stone coverings exist in various stages of preservation in the cemeteries, and it appears that most graves had covering stones. Only the pit grave in the Lower-central area had no evidence of a cover.

A unique feature of the Kephala cemetery is the walls that run throughout the cemetery. These are not "walls" in the true architectural sense, but are consecutive lines of stones laid out around several graves. The walls are stacked (Walls 5-6), stood vertical in the earth (Wall 1), or laid flat in circuit around graves (Walls 2-4). Coleman identified six walls. Four walls are located in the Lower Cemetery, and one large wall is in the Upper Cemetery. These walls and graves come late in the construction of the cemetery, and are only associated with the uppermost graves. As well, they mainly occur in the crowded central area of the Lower Cemetery. Wall 5 is located in the southwest corner of the cemetery, and has been highly eroded.

There are a limited number of functions the walls could have. Several may have acted to segregate certain groups of graves from others. For example, the walls in the Lower Cemetery appear to seperate four graves from the others: walls 2-4 surround graves K18 and K17; and wall 1 appears to distinguish K16 from the graves to the north and west of it. In this sense, they may have acted as grave markers, identifying common groups of individuals. Only one wall is large enough to impede access. This wall, built in the Upper Cemetery (Wall 6) is the largest of all the walls (2.0 m by 0.5 m). If the Upper Cemetery holds the most recent burials, this may have been built to enclose the disposal area when the site was abandonded.

The only other significant spatial distinction in the Kephala cemetery is by age. Only in K 31 are two infants buried together. Angel has noted that the two infants might be twins (Angel 1977:138). One suffered from thalassemia or sickle-cell anemia (K31.2), evidenced by porotic hyperstosis. This is the only case of thalassemia/sickle-cell anaemia in the Kephala mortuary population.[4] The grave which housed these infants lies isolated to the southeast of all others in the Lower Cemetery, quite segregated from the rest of the burials. It is reasonable to suggest, then, that these infants were purposefully buried in this location due to the circumstances of their death. The reason they were treated so differently from others in the cemetery may have pathological origins.

5. Symbolic Designations

Two possible means of symbolic designations were detected in analyses. The first is in the energy expended in mortuary treatment. The second is through unique artifact distribution. For Kephala, the energy expenditure index shows a ranking sequence from 23-48 was observed for the entire cemetery (Table 9.10). The consecutive sequence was broken after a score of 25, 33, and 46. This shows that there was at least four different levels of energy expended in the mortuary treatment at Kephala.

Ex Score	Skel. No.	Rank	Age/Sex
23	36	1	adult female
24	14.6	1	adult female
25	14.1	1	adult male
25	14.2	1	adult male
25	14.3	1	adult male
25	14.4	1	adult male
25	14.5	1	adult female
27	13.1	2	adult female
27	35	2	adult male
28	9.12	2	adult female
29	15?	2	undifferentiated
29	39	2	adult male
30	4	2	adult male
30	34	2	adult female
30	11	2	adult male
30	12.1	2	subadult female
30	24	2	adult female
31	10	2	adult female
31	20.9	2	Undiff Juvenile
32	20.1	2	adult male
32	20.2	2	adult male
32	20.3	2	adult male
32	20.4	2	adult female
32	20.5	2	adult female
32	20.6	2	adult female
32	20.7	2	adult female
32	20.8	2	Undiff Adult
33	1.22	2	Undiff Adult
33	23	2	undiff infant
33	27?	2	Undiff Juvenile
36	2	3	undiff infant
37	3.21	3	adult female
39	1.31	3	adult male
39	38?	3	undifferentiated
40	3.22	3	Undiff Adult
40	26	3	adult male
41	3.11	3	undifferentiated
41	7.31	3	adult female
41	7.32	3	adult female
41	9.11	3	adult female

***Table 9.10.** The distribution of energy expenditure scores in the Kephala cemetery.*

Ex Score	Skel. No.	Rank	Age/Sex
41	13.2	3	adult male
41	16.4	3	juvenile male
41	30?	3	undifferentiated
42	1.11	3	adult female
42	1.32	3	adult male
42	7.11	3	adult male
42	7.12	3	adult male
42	7.13	3	undiff infant
42	7.14	3	adult male
42	7.15	3	adult female
42	7.16	3	adult female
42	7.21	3	undiff infant
42	7.22	3	adult male
42	7.23	3	adult female
42	7.24	3	adult female
42	7.25	3	undiff infant
42	8	3	adult male
42	16.1	3	subadult female
42	16.2	3	Undiff Juvenile
42	16.3	3	adult male
42	25	3	undiff infant
42	32	3	adult male
43	1.12	3	subadult female
43	1.21	3	adult female
43	37	3	juvenile male
44	5	3	undifferentiated
44	12.2	3	undiff infant
44	17?	3	undifferentiated
44	18?	3	Undiff Juvenile
44	21?	3	undifferentiated
44	40?	3	undifferentiated
45	6	3	adult male
45	28?	3	undifferentiated
46	19?	3	Undiff Juvenile
46	22	3	Undiff Juvenile
46	31.1	3	undiff infant
46	31.2	3	undiff infant
48	29?	4	undifferentiated

Table 9.10. con't. The distribution of energy expenditure scores in the Kephala cemetery.

Overall, this data suggests that there were four social rank levels at Kephala.

The energy expended in the production of grave goods at Kephala shows there was differential allocation of valued symbols in the cemetery. As shown in Table 9.11 below, a score of 2 represents the highest energy expended in the material contribution to mortuary ritual. This score represents sociotechnically local valued symbols. Only 10% of individuals in the Lower Cemetery were given sociotechnic artifacts with symbolic value. On the other hand, 50% of those buried in the Upper Cemetery were given valued symbols. This may either be a result of the disporpotionate number of individuals in each cemetery, or may be linked to social prestige positions. These possiblities will be considered below.

	Location							
Symbol Value	LC-Central Group	LC-East Group	LC-Isolated	UC-East Group	UC-Isolated	UC-West Group	Total	% of Total
2	4	1	2	1	0	3	11	14.10%
2.5	8	0	0	0	0	0	8	10.26%
2.6	1	9	0	0	0	1	11	14.10%
2.8	0	0	0	1	0	0	1	1.28%
3	3	2	0	0	0	0	5	6.41%
4	33	5	2	1	1	0	42	53.85%
Total	49	17	4	3	1	4	78	100.00%
% of Valued in Location	8.16%	5.88%	50.00%	33.33%	0.00%	75.00%	14.10%	14.10%

***Table 9.11**. Location of valued symbols in the Kephala cemetery.*

Generally, the Upper Cemetery graves generally have lower scores in the index. Although, the Lower Cemetery has about 90% of the interments and unoccupied graves (those not found with skeletal remains), it holds only 64% of the valued symbols.

Therefore, even though the Upper cemetery holds only about 10% of the mortuary population, almost half the valued symbols are found here. This distribution is most likely the result of the sample size in each cemetery.

A more exclusive pattern emerges if these scores are broken down by age and sex (Table 9.12). Overall, symbolic artifacts appear to be constrainted by the age and sex of the mortuary population. Only adults and infants were given locally valued symbols. Only slightly more adult males than females were given symbolic recognition. However, proportionally, adult males (12.5%) were more frequently allocated valued symbols than females (4.76%). A large proportion of infants were designated with valued symbols (66.67%). This implies that a great deal of signficance was attached to the death of an infant. As described above, there is a relatively low infant mortality rate exhibited by this mortary population. These data suggest that the death of children was an uncommon event at Kephala.

Age/Sex	Symbol Value						Total	Value 2 % of Total
	2	2.5	2.6	2.8	3	4		
adult female	1	3	6	0	1	10	21	4.76%
adult male	3	4	3	1	1	12	24	12.50%
undiff adult	0	0	1	0	1	1	3	0.00%
subadult female	0	0	0	0	1	2	3	0.00%
juvenile male	0	0	0	0	0	2	2	0.00%
undiff juvenile	0	0	1	0	1	4	6	0.00%
undiff infant	6	0	0	0	0	3	9	66.67%
undifferentiated	0	0	0	0	0	2	2	0.00%
unknown	1	1	0	0	0	6	8	12.50%
Total	11	8	11	1	5	42	78	14.10%

Table 9.12. The distribution of valued symbols in the Kephala cemetery according to age and sex.

6. Mortuary Differentiation and Social Distinctions at Kephala

a) Mortuary Differentiation

The Kephala cemetery is characterized by built graves made with moderate to large stones, and pit graves for infants (Table 9.13). All graves are covered with stone slabs of varying sizes. This size of the covering stones is congruent with grave size. Grave shape is either rectangular or circular, and graves centre around 0.34 cubic meters in volume. The bodies of the dead were most often buried in multiple graves, but there are a few cases of single interments. In most graves, then, small groups of individuals (pairs or threesomes) were organized by separating them with successive layers of pebbled floors. The interior of a few graves was enhanced by covering the walls in a clay-plaster.

Feature	Referant Variable	Normative Treatment
Burial Facility	Facility Type	built
	Shape	rectangular/circular
	Avg. Volume (m^3)	0.34 m^3
	Floor	pebbled
	Walls	moderate-large stones
	Interior	none
	Exterior	cover slabs
	Disposal Area	cemetery
	Special Features	bounded disposal sub-areas
Preparation and Treatment	Age-Sex Categories	no juvenile females or subadult males
	Posture	disturbed/right side
	Orientation	disturbed/west facing
	PBA	flexed
	Cultural Modification	exhumation and reburial?
Burial Scenario	Interment Form	multiple burial
	Ritual Process	secondary burial
Burial Goods	Raw Material	stone
	Avg. #/interment	2.4
	Source	local manufacture
	Distance	>100 km
	Manufacture	locally-made goods
	Function	technomic

Table 9.13. The normative mortuary treatment represented at Kephala.

Spatially, the graves at Kephala are separated into an Upper and Lower Cemetery. Several rows of stones served to mark groups of graves into smaller units: a Western Group, a Central Group, and the Upper Cemetery. In each of the groups, certain individuals have high levels of energy expenditure: a lower western grave (K14.1-14.6); a central (K13.1) Lower Cemetery grave; and two Upper cemetery graves (K36.1, K35.1). The main difference between the graves is that grave K14 is a multiple burial, and K13, K36 and K35 are single interments.

All age and sex categories are represented in the Kephala sample, but there are no specific indications that juvenile females or subadult males were interred. Many interments were disturbed to a greater or lesser degree. Because graves were located on the face of a hillside, erosion has acted as the major post-depositional effect at Kephala (Coleman 1977). However, from the interments recovered intact, it seems most individuals were laid in a flexed position on their right side, facing west, or towards the sea. At Kephala, no modification of the skeletal remains, which could be considered post-mortem interment preparation (e.g., cut-marks, binding, etc.), was observed for any individuals.

The most common burial gifts at Kephala are stone artifacts, and two goods per grave is the average. The majority of burial gifts were made using local resources, acquired at least within a 100 km inland radius of the settlement. Most goods were locally made items intended for practical, everyday usage. Fortunately, many artifacts could be ascribed to certain individuals because of the careful organization of the bodies into layers. However, only adult females were given artifacts based upon their age and sex. The artifacts found with males were most often shared with females. Only two artifacts were associated only with males (bone tool, flint tri-scraper). Only with males and infants were figurines and figurine necklaces found. These artifacts are often considered to be of "ritual" significance (Talalay 1993).

Mortuary differentiation at Kephala is manifest through five mediums:

1. in the type, size and construction materials used to build the graves;
2. in the restricted numbers of infants, juveniles and subadults in the mortuary population;
3. in the allocation of valued grave goods to specific individuals;
4. in the spatial segregation of three groups; and
5. by four levels of energy expended in mortuary treatment.

b) Social Differentiation at Kephala

The mortuary treatment at Kephala reveals a highly differentiated mortuary population. Several vertical and horizontal social distinctions were recognized. (Table 9.14) The formal treatment, artifact occurrence, spatial pattern, and amount of energy expended in interment shows a pattern of constraint and structured differentiation.

(1) Vertical Social Differentiation

Four social rank levels were identified on the basis of the treatment of the body and the grave and the uses of valued symbols. The first rank level holds seven adult males and females which exhibited a high level of energy expenditure. A second group with moderate levels of energy expenditure was also identified. This group is composed of both males and females, but the age distribution in the group varies. The third rank level is characterized by the lowest ranking scores. Only adults and infants were identified in this category. It is notable that almost as many females belong to the first category as males. This suggests that both males and females held positions of authority and power in this society. The contexts in which these were played out is, however, indeterminable.

Social Distinction	Number	Age-Sex	Formal/Sybolic Designation	Artifact Differentiation	Comments
Vertical					
Special social distinction	1	Adult Male	moderate energy expenditure; ritual stone "pillow";	bone tool	
	1	Adult Female	moderate energy expenditure; ritual stone "pillow"; platform; trapezoidal grave	painted (black-red on buff) Type A1 bowl	
Hereditary Ascription	4	Infant, Juveniles, Subadult	energy expenditure	none	in Rank Level 2
Elevated social position	6	Adult Male and Female	high levels of energy expenditure; large grave volume; platform;	incised scoop; flint tool	
Horizontal					
Corporate Group	78	All	graves bounded in Eastern and Western areas in Lower Cemetery; all graves bounded in Upper Cemetery	no goods in Lower; unique goods in Upper	several individuals (K34-36, K39) recieved specifically higher levels of energy expenditure
Society Membership	4	Adult Female	moderate-high energy expenditure; built grave; platform	incised scoop; painted bowl (Type A1)	
Sex status (gender inversion?)	2	Adult Male	low level of energy expenditure; built grave	female figurine; figurine necklace	
Special Status					
Circumstances of Death	2	Undiff. Infant	isolated grave; low level of energy expenditure	none	one infant with sickle-cell anemia or thalassemia

***Table 9.14.** The dimensions of social distinctions represented at Kephala.*

Several other vertical distinctions beyond the rank levels were also noticed at Kephala. A dimension of elevated social position was expressed through high energy expenditure, grave size, and a grave platform. Both adult males and females belonged to this dimension. Within this dimension two cases of special prestige were noticed. The man and woman buried in K35 and K36 recieved a high level of energy in their interment and were buried upon the higher embankment. But it is mainly the ritual stone "pillows" that distinguish these individuals from the others. These are the only occurrence of this practice, and it is significant that these people were buried one over top of the other. It may be that the two adults were married, and the woman died after the male and was buried successively upon his earlier grave.

In consulting the ethnographic literature, Talalay (1991) has argued that the figurines found in the Kephala cemetery suggest the presence of an ancestor cult. The images are taken to be those of ancestors, which symbolized the villagers exclusive rights to and control of the local resources. In two cases we find these figurines with adult males, while in the other three cases they are found with infants and a person of unidentifiable age or sex. However, with the two adult males, their spatial location in the cemetery is important. One individual was found in the Upper Cemetery (K38), while the other was in the Lower Cemetery (K4). Following the argument made above, that each of these areas were the realm of different generational groups, and the suggestion that these images symbolized both ancestors and corporate group unity, it may be suggested that these two adult males held some position of ritual office in the community. Both men belong to the lowest category of rank, but this is not necessarily surprising. It is often the case in many societies where individuals who hold positions of ritual or spiritual significance (such as shamans) are accorded special distinction with the community, but are nevertheless always treated as "outsiders" for they deal mainly with the unknown and the aspects of life that others in the community fear. The modest mortuary treatment of these two men, and the artifacts associated with them, signify both their importance in the community as well as their exclusiveness.

The presence of another vertical dimension was also recognized at Kephala. It was observed that non-adults are found in all the rank levels occupied by adults (Table 9.15). Rather, a sub-adult, two juveniles, and an infant were identified to the second rank level. These individuals were treated differently than others of the same (or similar) age. This signifies that social standing at Kephala was not only a product of individual achievement, but also of that individual's birth. In other words, social status at Kephala was both achieved and ascribed upon birth. It is for this reason that we find sub-adults and juveniles in the second rank level. It is also, perhaps, for this reason that infants were found with figurines. In this context, they would not be viewed so much as protective amulets, but a symbolic display of an occupation or social position they were to be groomed for as they reached adulthood. In this case, a ritual office of some sort.

	Rank				
Age/Sex	**1**	**2**	**3**	**4**	**Total**
adult female	3	9	10	0	22
adult male	4	7	12	0	23
Undiff Adult	0	2	1	0	3
subadult female	0	**1**	2	0	3
Undiff Juvenile	0	**2**	4	0	6
juvenile male	0	0	2	0	2
undiff infant	0	**1**	8	0	9
undifferentiated	0	1	8	1	10
Total	7	23	47	1	78

Table 9.15. *The distribution of age and sex categories throughout the rank levels. Possible cases of social ascription of status are denoted in bold in Rank 2.*

(2) Horizontal Social Distinctions

Both energy expenditure and spatial location aid in identifying horizontal dimensions at Kephala. The most obvious spatial distinction is that the graves were separated into an Upper and Lower cemetery. Beyond this, several rows of stones served to demark groups of graves into smaller units. The graves can be seen to occupy one of three smaller spatial units (Illus. 9.8a, 9.8b): a West Group; a Central Group; and the Upper Cemetery. According to the Saxe-Goldstein hypothesis, there are three socio-economic or corporate groups spatially represented at Kephala.

These groups can be better defined if energy expenditure is taken into account. In each of the groups there is at least one individual that has a far greater amount of energy expended in their interment. In the West Group this is Grave K14; in the Central Group it is K13; and in the Upper Cemetery Graves K35 and K36 had a large amount of energy expended in their mortuary treatment. If this correlation between spatial location and energy expenditure is followed to its logical extent, it can be argued that each of the individuals with high energy expenditure in the three socio-economic groups had influence within the specific corporate group.

It is however, unusual that there are three corporate groups represented at Kephala. The problem is that each corporate group, by definition, must be associated with different rights and control of local resources. We should therefore expect individuals of high rank to be represented in each corporate group. However, high ranking individuals in each group is not redundant. Only individuals in two of the three groups belong to the upper rank level. Therefore, one individual held a subordinate position to the others of higher rank.

The identification of three corporate groups using the Saxe-Goldstein hypothesis is problematic. That is until time is taken into account. Rather than propose that three corporate groups existed simultaneously at Kephala, I would otherwise suggest that this pattern represents the mortuary deposition of a single corporate group generation by generation. In this case, differences in rank between the groups are a cumulative record of rank differentiation. They also serve as markers of variation between generations. The differences do support Coleman's theory that the Lower cemetery was the first planned and occupied; the layered burials and tombs suggest a long-time use of the lower cemetery. The occurrence of only single tombs in the Upper Cemetery suggests that these were more recent burials, not yet used to completion.

(3) Special Status Distinctions

The two special status distinctions are represented by the mortuary treatment at Kephala.. In the first instance, two infants were buried in an isolated grave without accompanying burial gifts, and both had low levels of energy expended in their mortuary treatment. One of these infants is thought to have been affected with sickle-cell anemia or thalassemia. This condition, as noted above, is fatal. It seems then that this non-normative treatment is indicative of the circumstances of the infants' death.

The other special distinction is based upon the underrepresentation of subadults, juveniles, and infants in the mortuary population in general. Given the fairly large number of individuals recovered from the cemetery, it curious that the number of non-adults is not higher. This exclusion or limitation of certain age groups in the cemetery may reflect a prohibitive ritual practice. This practice may be associated with a rite of passage. It is known that all initiates into a new social status go through a period of marginality until the ritual is complete, and a rite of aggregation is performed and the person is admitted with full responsibility into the next status. Until the right of passage is completed individals are not considered members of society, as they belong to a non-status liminal condition. When someone dies in this liminal condition they are, therefore, essentially not members of the community. Those that were not included in the cemetery may have held such a "liminal" status, and died before the transition to the next status was completed.

C. Tharrounia: the Settlement, Cemetery, and Cave

1. Introduction to the Site

The Late Neolithic-Final Neolithic site generally termed "Skoteni Cave" is actually made of three elements: a cemetery, a settlement, and the Skoteni Cave (Illus. 9.14 and 9.15). All lie in an area about three kilometers away from Tharrounia village, and one kilometer from the Panagia settlement. The cave itself is found within a low rocky plateau (450 m asl.), opening north onto a deep gorge where the Hondros river flows, eventually out to the Aegean Sea. Beyond this lies a small glen dominated by olive trees and high shrubs. The cave is the largest in Euboea (Sampson 1993:288), with a narrow entrance leading into an expansive inner chamber (Illus. 9.16). The cave is quite old geologically, exemplified by the massive columns formed by meeting stalactites and stalagmites. The cave was occupied regularly from the LN to FN phases of the Neolithic (5300-3200 B.C.). Most of the finds in the cave, though, date to the LN phase (5300-4500 B.C.), with few remains in FN contexts (4500-3200). Although occupied successively during the LN, habitation was irregular and sporadic (Sampson 1993:299). The functional use of the cave also seems to have been limited. Judging from the abundance of large storage vessels (>700 *pithoi*) placed in the cave during the LN-FN phases (Sampson 1993:300), it seems to have had a role in an organized storage system. A few skeletal remains were found within the cave, all belonging to the LN and FN phases (Sampson 1993:289). This suggests that the cave also played a part in the mortuary ritual of those living in both the cave (LN) and in the later settlement.

The settlement is located on a nearby plateau and is approximately three acres in area (Sampson 1993:295; see Illus. 9.15). Most finds belong to late in the Final Neolithic, but several scrapers and blades seem to date to a pre-neolithic context (Sampson 1993:296). Despite severe erosion in the area, FN pottery, obsidian and other stone implements, such as millstones and grinders, were recovered from surface survey of the area (Sampson 1995:295). Stone foundations were discovered around the settlement, and are thought to belong to either buildings or a surrounding circuit wall (Sampson 1993:295). Later excavation showed some evidence of structures. A depression made in a rock in Trench A could have served as a post-hole, and two walls, both running east to west in Trench B and Trench D, may have acted as a foundation walls (Sampson 1993:296). Numerous "domestic" items in Trench B and D, such as bowls, *pithoi*, obsidian blades, millstones, and grinders, attest to the possibility of these being habitation structures of some sort. This evidence falls in line with the evidence from the cave.

Common use of the cave in the LN contrasts to a FN pattern of dense occupation levels in the settlement and infrequent use of the cave.

About 400 m to the southwest of the settlement, the cemetery occupies a low rise. (Illus. 9.15) Regular cultivation and erosion have damaged much of the deposits, contributing to partial, and in some cases, complete destruction of the graves. For example, Grave 7 was located some 15 m away from the first group of seven graves discovered (Sampson 1993:297). This grave belonged to a second group of burials, with, unfortunately, almost all destroyed. As well, Sampson noted that slabs from the graves could be noticed in the stone fences that wind throughout the area (1993:296).

The skeletal material from both the cave and the existing cemetery was studied by physical anthropologists (see Stravopodi 1993:378-391), and despite the disturbed state of a few graves, the overall condition of the remains is sufficient for this analyses. Several comparisons to the FN cemetery at Kephala have been made by Sampson, although he believes the two cemeteries to fundamentally differ in many ways (Sampson 1993:296). However, there are also some similiarities between the two sites. For example, the so-called "scoops" found at the Tharrounia settlement (Sampson 1993:293) and in the cemetery at Kephala, show contemporaneity in what is thought of as "ritual furniture."

2. Formal Treatment

a) Mortuary Facility

Two types of formal disposal areas are represented at Tharrounia. In the Late Neolithic, bodies were interred within the cave (Illus. 9.17). Erosion has claimed the precise dimensions and shape of the graves. However, on the basis of stratigraphic relationships, the bodies were certainly buried. Most of the mortuary remains at Tharrounia date to the Final Neolithic phase (80%) (Table 9.17). Most individuals seem to have recieved a formal interment in the cemetery (67%), but other scattered bone elements were displaced in Trenches A, B, and C in the eastern section of the cave (Illus. 9.17).

		Phase		
Location	Data	FN	LN	Total
Cave	Count	5	8	13
	% of Row	38.46%	61.54%	100.00%
	% of Column	15.63%	100.00%	32.50%
	% of Total	12.50%	20.00%	32.50%
Cemetery	Count	27	0	27
	% of Row	100.00%	0.00%	100.00%
	% of Column	84.38%	0.00%	67.50%
	% of Total	67.50%	0.00%	67.50%
Total Count		32	8	40
Total % of Row		80.00%	20.00%	100.00%

Table 9.16. The general spatial and temporal distribution of mortuary remains at Tharounia.

In the cemetery, individuals were buried in one of two formal cemeteries. Due to the processes identified above, most remains, though, were recovered from Group 1 (64%; see Illus. 9.18). The remainder belong to one recovered grave in Group 2 (9%). Distinguishing two distinct cemeteries at Tharrounia is justified based upon their spatial seclusion from each other, as 15 m separate the two cemeteries. All burials in each cemetery were built graves, roughly circular in shape (data presented in Appendix Table 9.2). There is little variation in the architectural features of the tombs. Most walls were constructed of horizontally laid slabs (63%), but there are two other cases where a grave was both slab and stone-lined, or stone-lined on only two sides. It is unknown precisely what the walls of Grave 7, in Group 2, were constructed of. However, from the surrounding debris, it would not be unreasonable to suggest a similar architecture. The graves show no substantial treatments of the interior or special features, save that one grave had two distinct levels.

Grave #	L	W	r	r2	Π	Depth	Volume
1	1.4	1.4	0.7	0.49	3.1416	0.65	1.000597
2	1.4	1.4	0.7	0.49	3.1416	0.6	0.923628
3	1.25	1.2	0.6125	0.37516	3.1416	0.8	0.94287
4	1.15	1	0.5375	0.28891	3.1416	1.25	1.134532
5	1.25	0.85	0.55	0.3025	3.1416	0.7	0.665232
6	0.55	0.45	0.25	0.0625	3.1416	0.8	0.15708
8	0.14	0.75	0.2225	0.04951	3.1416	0.8	0.124423
7	unknown	unknown	unknown	unknown	unknown	unknown	unknown
Average	1.02	1.02143	0.5104	0.29408		0.8	0.706909
Avg. Dev.	0.38571	0.26735	0.1566	0.13752		0.1286	0.335426
Std.Dev.	0.48422	0.34744	0.198	0.18115		0.2141	0.411319

Table 9.17. *Dimensions of the graves in the Tharrounia cemetery.*

While there is little variation in the surface features of the graves, there is substantial variation in thier size (Table 9.18). The greatest deviation comes in the length and volume of the graves (38.6% and 35.3%, respectively). Graves 5, 6, and 8 are quite small compared to the others, ranging from 85% to 37% smaller than the large graves. Graves 6 and 8 are less than 0.2 m^3 in volume, and Grave 5 is just less than average (0.665 m^3). This is quite significant when over 57% of the graves are at least 0.9 m^3 in volume, a cumulative difference of over 3 m^3 of earth.

The Tharrounian graves are either greater or less than 1.25 m in length, with an average of 1.02 m. Again, Graves 6 and 8 are particularly small at 0.55m and 0.14 m, respectfully. Aside from variation in size, when the number of individuals interred in the graves is taken into account, this shows that the size of the grave has little concordance with the number of individuals interred (Appendix Table 9.2). For example, Graves 1 and 2 are the largest graves in the cemetery. Grave 1 holds only two individuals, while Grave 2 is a single interment. The moderately sized graves (3-5) hold the greatest number of individuals (4 or 5 people). The second smallest grave (Gr. 6) holds 5 people, and the smallest grave (Gr. 8) holds 3 people, the group average.

b) Pre-Interment Treatment

In her report on the osteological remains, Stravopodi (1993) outlined what she considered to be approximately 40 individuals, located both within the cave and the formal cemetery. Approximately 13 individuals were identified within the cave. The remaining 27 were buried in a tomb in the cemetery (Table 9.16 above). In chronological terms, however, all individuals belonging to the LN phase were given interment in the cave, while one finds the remains of possibly 5 (16% of FN) individuals in the cave during the FN.

All the burials at Tharrounia were in a disturbed state when recovered. (Appendix Table 9.2) But, in the cemetery, all interments are thought to have been placed in a flexed position (Sampson 1993:297). However, this leaves us with little information available on the original orientation of those individuals buried. Those individuals found in Trenches A and C in the cave also were scattered about, probably by later occupations of the cave (Sampson 1993:289).

The bone elements recovered from Trenches A and C differ from those found in the cemetery. In Trenches A and C the 13 individuals were represented by several long bones, ribs, isolated vertebrae, metatarsals, and carpals. One LN skull belonging to a juvenile female was found in a niche in the eastern wall of the cave (No.10.1). In the FN cemetery, large cranial elements (entire skulls, mandibles, maxillae, teeth), vertebrae, and a range of other post-cranial elements were found. Although the bone elements from the cemetery show no completely articulated individuals, there is a greater bone element range represented than in the cave during the same period.

From the available data, it seems that little modification was made to the body during the pre-interment treatment stage, such as binding the body or cutting tendons and muscle tissue to put the body in the desired position. Similarly, if one looks at the pathologies noted by Stravopodi (1993), there are few cases suggesting endemic or congenital sources, with no specimens showing signs of trauma (cut marks, injury, etc.) Most of the mortuary population at Tharrounia exhibited no discerable pathology (25%), although I would suggest some specimens are suspect (37.5%), based upon their age. Cases of arthritis (12.5%), advanced osteoarthritis (10%), and a combination of arthritis and osteoporosis (10%) dominate the pathological specimens. All of these cases are adults, with both females and males represented. The nature of the pathologies suggest only that they were brought about by occupation (Stravopodi 1993:386). Two individuals, both juveniles, showed signs of porotic hyperstosis, one from the cave (LN, 3.5) and one from the cemetery (FN, 10.1). However, because of the advanced age of these individuals (for those having porotic hyperstosis in prehistoric populations; Stravopodi 1993:385), Stravopodi suggested that these lesions may rather reflect iron deficiency anaemias (1993:385). A growing body of evidence (e.g. Stauss 1978; Stuart

Macadam 1987a, 1987b) suggests that iron-deficiency may in fact strengthen the bodies ability to fight off infection, rather than acting detrimentally. However, I argue that this does not adequately explain the infant:juvenile death ratio observed for this site (see below), or for Neolithic populations showing this pathology (see Angel 1964a, 1964b, 1967, 1971). Furthermore, there is not one case of either a subadult or an adult showing signs of lesions on either bones or teeth that is characteristic of iron-deficiency or porotic hyperstosis. This only leads us to question how "advantageous" either of these deficiencies are. However, there is no reason to argue with Stravopodi when she proposes that

> porotic hyperstosis is the result of the interaction of diet, hygiene, parasites, and infectious diseases, its concept as a response to high pathogenic loads could explain why individuals which appear to have diets rich in iron and protein still show cases of anaemic bone changes, a possibility in Tharrounia and Kephala cases (1993:386).

However, as a caution, I would limit these claims to only individuals of infant or juvenile age (<12 yrs).

c) Age and Sex Distribution

A total of eight individuals can positively be identified to the LN period. (Table 9.19) All were found in Trenches A and C. There was apparently several bone fragments found in Trench B (Stravopodi 1993:381), but it is unsure if these represent an individual. The remains in Trench B could be aged or sexed. It is then probable that they were displaced from either Trench A or C.

	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	0	1	1	12.50%
Female	0	1	0	0	1	12.50%
Undifferentiated	1	4	0	1	6	75.00%
Total	1	5	0	2	8	
% of Total	12.50%	62.50%	0.00%	25.00%	100.00%	100.00%

Table 9.18. Age and sex distribution of remains in the LN disposal area.

There is not a great range represented in age or sex by these remains. Only adults, juveniles and an infant were determined from the skeletal remains in the cave. One adult could not be differentiated according to sex, while the other suggests a male of adult age. One of the five juveniles was identified as female, but the others could not be differentiated. And, as is commonly the case, the infant's sex was indeterminate. This pattern of disposal does, however, not suggest that individuals of a certain age or sex where excluded from burial in this area. Rather, considering the number and specificity in terms of age and gender of the remains, the pattern reflects more one of exigency. There is little in the way of permanent habitation of either the cave or the surrounding area during the LN. In this respect, this area of the cave may reflect only a disposal area used during short occupations of the cave, perhaps even seasonally, as Sampson has suggested (1992; 1993). Such a widely skewed age and sex distribution would not then be unusual in this case.

	Undifferentiated	Infant	Juvenile	Subadult	Adult	Total	% of Total
Male	0	0	0	0	9	9	30.00%
Female	0	0	0	1	8	9	30.00%
Undifferentiated	2	3	5	1	3	12	40.00%
Total	2	3	5	2	20	30	
% of Aged		10.71%	17.86%	7.14%	71.43%		
% of Total	6.67%	10.00%	16.67%	6.67%	66.67%	100.00%	100.00%

Table 9.19. *Distribution of age and sex in the FN cemetery and cave.*

In contrast to the LN skeletal remains, the age and sex distribution of the FN remains is more uniform (Table 9.20). Forty percent of the individuals could not accurately be assigned a sex. Of those that were identified, males (30%) and females (30%) occur in the same frequency. Only one subadult was identified as female. In terms of age, few subadults (7.14%) or infants (10.0%) are represented as compared to juveniles (16.67%). In the Tharrounia cemetery adults dominate the age categories, with 71.43% of the aged sample. Overall, the mortuary population expresses a low mortality rate. There are higher numbers of juveniles than infants in the sample, but this may be a result of differential preservation.

3. Artifact Occurrence

There are few artifacts represented in the FN graves at Tharrounia. According to Sampson (1993:296-297) only four objects can be considered as grave goods (Table 9.21). Each grave good was manufactured from or represents a different raw material. There is one example of a terracotta spindle-whorl from Grave 2; a stone quern and a plain pottery vessel from Grave 4; and a *spondylus* ornamental shell from Grave 6. All gifts were manufactured or collected locally and all belong to the Group 1 tombs of the cemetery. The goods in Graves 2 and 4 were found within the context of the grave, but the *spondylus* shell was found on top of the grave. Sampson (1993:297) argues, however, that this could represent an offering to one of those in Grave 6. Sampson also notes that the lack of burial gifts cannot suggest poverty (1993:297). Rather, this shows us a custom already noted at Kephala and observed at Yali, Nissiros (Sampson 1993:297).

In terms of artifact distribution, the gifts represented at Tharrounia do disburse into a hierarchical pyramid. However, difficulties arise from these graves mainly being multiple interments, so only grave units can be ranked. Further, since only four grave goods were found, it is unlikely that wealth is a differentiating factor at Tharrounia. If this were the case, one would not expect to find utilitarian grave goods representing "wealth."

a) Artifact Associations

Due to the practice of multiple interment it is difficult to assign any of these grave goods to a particular individual, save the person buried in Grave 2. Another unfortunate problem is that the age and sex of most of the individuals given the goods is unknown. However, for the case of the stone "quern" found in Grave 4, it is possible to suggest some association with an individual. In his report, Sampson states that this good could not "have served to support [...] the dead man's head" (Sampson 1993:296), suggesting it was found near one of the adult males in the grave. Why this artifact did not act as a ritual stone "pillow" is not stated by Sampson. Considering the disturbed state of the remains, and the association of the artifact with one of the three adult males in the grave (60% of this graves interments), I would suggest otherwise. I argue this mainly because a contemporary practice has been noted at Kephala, most possibly to designate individuals of some reknown in the community. As I will show later, this observation can, fortunately, be put in a clearer context.

4. Spatial Pattern

There are two spatial patterns at Tharrounia, one in the cave and another in the cemetery, but both show segregation practices. In the cave, the burial areas located in Trenches A and C, were initially thought to be a spatial product of excavation. However, there is a large space of over 2 m seperating the two areas. The unusual feature of these burials, is that an equal number of individuals were found in both Trench A and Trench C. This might also be a product of excavation, or coincidence, until one looks at the age-sex distribution. Each Trench has one adult and two juveniles present. Otherwise, in Trench A one infant was also interred, and in Trench C, a juvenile female. Trench A is characterized by an infant:juvenile:adult ratio of 1:2:1, whereas Trench C shows a 0:3:1 ratio. Considering the area that was excavated around these burials, it is perhaps more signficant as to where they were buried, then who was buried.

In the FN cemetery a similar situation prevails. The most obvious spatial distinction is that there are two cemeteries. In the Group 1 graves, there is no indication that individuals were spatially arranged according to any biological parameters. The pattern is fairly consistent, with adults being present in every grave. The only grave where this is not the case is Grave 2, and this individual could not be assigned an age or sex. As well, it seems that subadults, juveniles, and infants were accorded no special treatment in terms of spatial distribution according to either their age or sex. They are buried, it seems, randomly in the graves occupied by adults. Even the individuals who show evidence of porotic hyperstosis where not buried in a segregated location, as found at Kephala. But, unlike Kephala, at Tharrounia this congenital disease is linked to juveniles rather than infants. At Tharrounia, then, those of juvenile age are accorded much the same treatment upon their death as subadults and adults; a pattern also characteristic of Kephala. The circumstances of a person's death could be of little consequence to their program of disposal, at least after the age of 2 years.

5. Symbolic Differentiation

During the Final Neolithic at Tharrounia, symbolic designations were detected in two analyses: energy expenditure and artifact distribution. However, with the latter, the meaning behind the exclusive distribution of burial gifts is somewhat elusive. Those individuals represented in the LN disposal area in the cave did not show any differentiation in the amount of energy expended in their mortuary treatment. That the skull of a juvenile female was found in wall niche (Sampson 1993; 1994) does not seem significant. The skull was found in context with a later occupational level, but did belong to the disturbed remains of the subadult female found in the LN context. It would seem likely, then, that the skull was unintentionally unearthed, and was placed in a natural wall niche to take it out of the way. It is noteworthy however, that the skull was not discarded, but that its later disposal is reminicent of other practices in Greece during the LN where skulls of the dead receive special treatment (cf. Hourmouziadis 1977; Jacobsen and Cullen 1981).

In the FN cemetery, the preparation of the body and the grave rank scores ranged from 26 to 39 (Table 9.22). The sequence exhibits three significant breaks after 26, 28, 34, and 37. This sequence shows that at least five different levels of energy were expended in facility and body preparation, and the material contribution to ritual. As the preparation of the body showed little variation, it is mainly with facility preparation where differences in energy expenditure is found. As a unit, those in Grave 4 exhibit the greatest level of energy expenditure. This is mainly due to the size and construction of the grave; the bodies were prepared much the same. The effort to acquire, move, and place the massive stone slabs in making this grave was considerable, particularly the large western slab. For this reason Graves 1, 2, 3, and 5 are ranked lower. These graves were either made of smaller stone slabs (Grave 5), or with a combination of slabs and moderate sized stones. Graves 6 and 7 show a signficant break from the previous group. Grave 6 is quite small and is made only of small to moderate sized stone. From what can be determined of Grave 7, the energy expended in the making of this grave would differ little from that of Grave 6 in Group 1. The small size and materials used in the construction of Grave 8 accounts for its low rank score.

EX Score	Skel. No.	Rank Level	Age-Sex
28	2	1	unknown
28	3.1	2	adult male
33	4.1	3	adult male
33	4.2	3	adult female
33	4.3	3	adult male
33	4.4	3	adult male
33	4.5	3	undiff subadult
34	1.1	3	subadult female
34	1.2	3	adult male
34	3.2	3	adult male
34	3.3	3	adult female
34	3.4	3	adult female
34	3.5	3	undiff juvenile
34	5.1	3	adult male
34	5.2	3	adult female
34	5.3	3	adult female
34	5.4	3	undiff adult
34	5.5	3	undiff juvenile
37	6.1	4	adult male
37	6.2	4	adult female
37	6.3	4	undiff adult
37	6.4	4	undiff juvenile
37	6.5	4	undiff juvenile
37	7	4	unknown
39	8.1	5	adult female
39	8.2	5	undiff infant
39	8.3	5	adult male

Table 9.20. *Distribution of energy expenditure in the Tharrounia cemetery.*

The only grave gift that can be suggested to represent a symbolic designation is the stone "quern" found near one of the adult males in Grave 4. Based upon the energy expended in the treatment of this body and the associated grave, it is not unusual to find such an artifact particularly associated with an adult male. A stage for comparison with Kephala is ripe, but must first yield to an understanding of normative treatment of the dead at Tharrounia.

6. Mortuary Differentiation and Social Distinctions at Kephala

a) Normative Treatment

During the LN at Tharrounia there is unfortunately little data to round out a picture of the normative treatment of the dead (Table 9.23). It can be proposed, however, that the burial facility was probably a pit with an earth floor. This particular part of the cave acted as a disposal area during the LN, and most probably a seasonal one.

In the LN, individuals are represented by a small range of cranial and post-cranial bone elements, suggesting that the bones representing the final interment went through a process of selection. Whether the bodies were laid out and exposed as carrion, or they were buried, exhumed, and re-buried in the cave, can be a question of debate. Regardless, the bodies of the dead were modified through a pre-interment mortuary ritual before final interment took place. From the gross number of individuals represented, it is unlikely that the cave was treated as little more than an occasional disposal area for the dead. It is unlikely, though, that the cave itself would have acted as a place for initial burial, as no other fragmentary skeletal remains were found in the grave that dated to the LN phase. In general, the burial scenario represented during the LN is characterized by multiple inhumations in shallow pit graves. There is no evidence, either pathological or spatial, to suggest mass burial of these individuals. Interments must have been successive, rather than *en masse*. Curious, however, is that those interred in the cave were placed into two spatially distinct areas, separted by several meters. This seclusion practice was certainly intentional, and reflects the pattern noted in the later FN phase.

	Variable	Final Neolithic	Late Neolithic
Burial Facility	Facility Type	built	pit?
	Shape	irregular circular	unknown
	Avg. Volume (m^3)	0.8 m^3	unknown
	Floor	earth or bedrock floor	earth floor
	Walls	moderate-large slabs or stones	none
	Interior	none	none
	Exterior	cover slabs	unknown
	Formal Disposal Type	cemetery	disposal area
	Special Features	bounded disposal sub-areas	2 distinct burial areas
Preparation and Treatment	Age-Sex Categories	infants, juveniles, subadults underrepresented	skewed
	Interment Type	inhumation	inhumation
	Posture	disturbed	unknown
	Orientation	unknown	unknown
	PBA	flexed	disarticulated
	Cultural Modification	exhumation and reburial	exhumation and reburial?
Burial Scenario	Interment Form	multiple burial	multiple burial
	Ritual Process	secondary burial	secondary burial
Burial Goods	Raw Material	stone/terracotta	none
	Avg. #/interment	0.15	none
	Source	local manufacture	none
	Distance	>100 km	none
	Manufacture	locally-made goods	none
	Function	technomic	none

Table 9.21. Normative treatment at LN and FN Tharrounia.

The Tharrounia cemetery is a true cemetery in the sense that it is dislocated from the contemporary settlement. The location of Grave 7 and the other graves found destroyed around it, suggest that there was two distinct formal disposal areas at Tharrounia. The precise architectual features of the second group of graves is not known, but Sampson considers them to have at least been built graves. In this sense, the two disposal areas can be thought of as one contemporary cemetery, divided into two parts. All individuals, then, recieved burial in built graves, and we know at least those in Group 1 were irregular, circular shapes. There is a large degree of consistancy in the material used to build the graves. Either stone slabs or irregularly shaped stones were used in construction. Only the size of the building materials and the graves varies.

Bodies at Tharrounia were inhumed in a flexed position. However, a surprising number of smaller bone elements, such as phalanges, isolated vertebrae, and rib fragments were not discovered among the bones. Instead, in the cave we find many of these bone elements belonging to the main age and sex categories represented in the cemetery. Subadults are underrepresented in the cemetery, and no associated skeletal bone elements were determined in the cave. This pattern of selective bone disposal is characteristic of the ritual practice of secondary interment. This observation combined with there being no indication that the bones had been modified in any physical way, by either cut marks to sever tendons or wrappings to hold the body in a contracted position, it must be argued that he body was interred in a contracted position some extended time after the death of the individual. In this situation the ritual practice of exhumation and reburial seems a likely candidate for the method of preparing the body. The burial scenario during the FN is then characterized by the practice of secondary burial, and multiple inhumation in built graves.

Burial gifts at the cemetery are few, with only 0.15 being the average per interment. The gifts are primarily of stone or terracotta. All seem to have been of local manufacture and functioned as technomic items during their life-use. The only exception is the spondylus shell, which was a widely traded item. This item was found above grave number six, and was the only shell found in situ. The disturbed upper strata of the cemetery certainly has some relationship to this being the only shell found in the cemetery.

b) Mortuary Differentiation

Mortuary differentiation at Tharrounia is manifest through five mediums: 1) in the form, size, and construction materials used to build the graves; 2) in the restricted numbers of infants, juveniles, and subadults in the mortuary population; 3) in the specific allocation of grave goods to certain individuals, or possibly grave units; 4) the spatial segregation of two formal disposal areas; and 5) four levels of energy expended in mortuary treatment.

Although the mortuary treatment at FN Tharrounia present a relatively homogeneous picture, there are several elements of the mortuary treatment that are variable. One notable variation in mortuary treatment is the almost total lack of subadults in the cemetery or the scattered remains in the cave. This is unusual only because both juveniles and adults dominate the frequency of individuals in the cemetery. This pattern does not show a normative distribution of age and sex categories.

Another variation is in the size of the graves in terms of volume. As noted above, this is a principle indicator for the amount of energy expended in mortuary treatment. Those buried in Grave 4 recieved the highest score in this regard, even though the grave was multiple interment. I argue that each individual was recieving basically the same energy in mortuary treatment because comprable energy must be expended to dismantle and rebuild part of the tomb in order proceed with successive interments. In other words, the process of dismantling part of the grave, interring and arranging the body, covering the body with earth, and rebuilding the grave, is comprable to the energy expended in intially constructing the grave. The larger the grave, the greater the effort.

From the data in the reports by Sampson, there is little to suggest differentiation in preparation in treatment of the body. There is however, a notable preferance as to who did and did not receive burial gifts in the cemetery. It is probable that only four individuals recieved gifts upon their death at Tharrounia, and half of these were found in one grave.

c) Social Differentiation

Only the mortuary differentiation observed at FN Tharrounia provides a basis to suggest how social differences were symbolically manifest. In this sample differentiation was detected in all three dimensions of social distinctions (Table 9.25).

(1) Vertical Social Differentiation

In the FN cemetery, differential energy expenditures allowed five social rank levels to be identified. The first rank level is characterized by the highest energy expenditure and holds one individual who recieved a single grave good. The single individual in the second rank level has a lower level of energy expenditure. The third rank level is characterized by moderate energy expenditure. The majority of the mortuary popualtion was identified to the third rank (n=16). The fourth rank level has six individuals who recieved low energy expenditures in their mortuary ritual. Only three individuals were identified to the lowest (fifth) rank level.

The mortuary pattern suggests several other types of vertical social differentiation. Both the individuals in Rank 1 and Rank 2, obviously held some prestige within the community. As well, the individuals in Grave 4, with high energy expended in their mortuary treatment, show an elevated social position. In this group, one adult male was symbolically recognized as having achieved a special social distinction in life, represented by his large grave, the relatively high energy expended (upper scores of the third rank level) in his mortuary treatment, and the ritual stone "pillow" given to him upon his death.

	Rank Level					
Age-Sex	**1**	**2**	**3**	**4**	**5**	**Total**
adult female	0	0	5	1	1	7
adult male	0	1	6	1	1	9
undiff adult	0	0	1	1	0	2
subadult female	0	0	1	0	0	1
undiff subadult	0	0	1	0	0	1
undiff juvenile	0	0	2	2	0	4
undiff infant	0	0	0	0	1	1
unknown	1	0	0	1	0	2
Total	1	1	16	6	3	27

Table 9.22. *Distribution of age and sex groups by rank level in the Tharrounia cemetery.*

In the Tharrounia sample, all ages are not represented in each rank level. There is no evidence that younger individuals were assigned to the upper rank levels. Therefore, this suggests that social identity in FN Tharrounian society may have been exclusively a product of individual achievement (Table 9.24). In other words status was *achieved* in this society, and not *acribed* to individuals.

Social Distinction	Number	Age	Sex	Formal/Symbolic Designation	Artifact Differentiation	Comments
Final Neolithic Cemetery						
Vertical						
Special social distinction	1	Adult	Male	high energy expenditure; large built grave	ritual stone "pillow"	
Elevated social position	5	Adult and Subadult	male and female	high energy expenditure; large built grave	none	
Horizontal						
Corporate Groups	2	All	All	segregated disposal area	not determinable	includes Grave 7 of Group 2
Social/Occupational Membership	1	Adult	Female?	high energy expenditure; large built grave	spindle whorl; plain vessel	
Age Status	18	Adult	Male and Female	inclusion in cemetery	none	
	2	Subadult	Female and ??	inclusion in cemetery	none	
	4	Juvenile	Male? and Female	inclusion in cemetery	none	
	1	Infant	undifferentiated	inclusion in cemetery	none	
Special Status						
Alternative Treatment	n/a	infants, juveniles, subadults	undifferentiated	prohibitive ritual exclusion from cemetery	n/a	individuals may have died as initiates without social status
Late Neolithic Disposal Area						
Vertical						
Not observed						
Horizontal						
Corporate Group/Kinship Association	2	skewed	skewed	spatial segregation	none	
Special Status						
Not observed						

Table 9.23. *The dimensions of social distinctions represented at Tharrounia.*

(2) Horizontal Distinctions

The only spatial pattern that is consistent with the mortuary pattern at Tharrounia is the segregation of individuals on some social and/or economic basis (Saxe 1970, 1971; Goldstein 1981). There are two possible interpretation for this pattern. First, the two distinct disposal areas correspond to the exclusive disposal areas of corporate groups, (Group 1 graves representing one group, and Group 2 the other), who occupied the settlement at the same time. Second, the two disposal areas represent the disposal areas of two social groups who occupied the area during different seasons. Sampson (1992) has suggested that Tharrounia was a seasonal settlement, and that the group(s?) who used it were semi-nomadic pastoralists. There is ample ethnographic documentation of groups who occupy similar territories during different seasons.[5]

Individuals were socially differentiated based upon their age. At Tharrounia there is either an exclusion or a limitation of certain age groups in the cemetery. This may reflect a prohibitive ritual practice. The presence and absence of younger individuals may partially be explained if a rite of passage correlate is considered. For example, the presence of the lone infant presents an enigma, unless it is suggested that this particular infant successfully passed the first rite of passage. In some societies, this is a naming rite. This also helps explain the low social rank of the infant. Such a practice may also have been the case with the juveniles and subadults present in the cemetery. Those that were not included in cemetery may simply have held a "liminal" status, and died before the transition into the next social status was complete. This greatly helps to explain the underrepresented number of subadults, juveniles, and infants in the mortuary population.

The only other representation of non-normative social distinction may be represented by the spindle whorl and plain pottery vessel. These would best designate some form of occupational membership, and they may belong to an adult female in Grave 3.

In sum, at Tharrounia in the Final Neolithic we find individual and group social differentiation being based upon the criteria of age, sex, and kinship. These differences are expressed in form of spatial pattern, the age and sex structure, and the four levels of social rank exhibited at Tharrounia. The spatial pattern at Tharrounia is characterized by a structured, formal area for the exclusive disposal of the dead apart from the settlement, and a distinctive spatial clustering of burials into two areas, the Group 1 and Group 2 burials.

This pattern is characteristic of socio-economic group membership, or the existence of corporate groups. Within a corporate group it becomes increasingly necessary to set rules stating who has rights to corporately held assests and who does not. In other words, there are formally defined rules of membership and exclusion. Membership in Group 1 is characterized by the clustering of Graves 1 to 6, and Grave 8. In Group 2, membership is exhibited by Grave 7, and the remains of several other nearby graves. However, there must also be evidence of exclusion in order to characterize corporate groups. Within the Group 1 graves, there is distinct lack of infants (n=1), juveniles (n=4), and subadults (n=2). This pattern may be explained if two prohibitive social directives are taken into account. The first directive follows from the argument made above, that in order for individuals to be buried in the cemetery they must be a member of the society. If the individual held a "liminal" social status at the time of their death, they would not be accorded a normative mortuary treatment.

The high frequency of adults, and the low frequency of infants, juveniles, and subadults, suggests that mortuary ritual differed according to age, but was grounded in rules of social membership and exclusion. According to the energy expenditure calculations there are five rank levels at Tharrounia, with individuals of most every age present in the lower levels. To only say that each grave unit involves *family* members is simply not adequate to explain why an individual should be placed in one grave and not another. For example, this does not explain why Grave 2 held only one individual. It is exceedingly difficult to be a family of one. In this society, it appears that the status of any individual will be concurrent upon their ability to complete the necessary rituals of passage, and contribute to the society in the form of leadership, specialized skills, or both.

Notes for Chapter 9

[1] There are three settlement patterns typical of Greece. There is often a move from upland to lowland villages (Sutton 1991:401; McNeill 1978:50-64; Wagstaff 1968:175); there is a move from inland villages to coastal villages (Sutton 1991; Kolodny 1974:259-266); and, under certain economic conditions, there is commonly a nucleated or dispersed settlement pattern (Sutton 1991:401). A study of settlement and land use in Greece has shown these patterns to also be typical of the settlement dispersal that occurred in the Kalmos region in northeastern Attica in recent history (Fowler 1995).

[2] These sites include Franchthi (Jacobsen 1973), Kitsos Cave (Lambert 1981), Tharrounia (Sampson 1993), Kephala (Coleman 1977), the islands of Rhodes (Aliminia) and Leros (Parthemi) (Sampson 1987), Giali (Sampson 1988), and Grotta on Naxos.

[3] This estimate is based upon the number of recovered individuals (NISP- number of individual specimens), and the total number of graves recovered that did not contain skeletal material (=MNI- miniumum number of individuals). The loss of these skeletal remains is due to erosion which had completely or partially destroyed several graves at the time of excavation (Coleman 1977).

[4] Both thalassemia and sickle-cell anemia are autosomal recessive genetic traits characterized by abnormal hemoglobin, a protein found in red blood cells. Thalassemias are actually a group of heritable hemoglobin diseases associated with either an decrease or absence of hemoglobins, which transports oxygen from the lungs to the rest of the body (Cummings 1991:241). Sickle-cell anemia is a fatal recessive genetic disorder common in populations of West Africa (or people of West African heritage) and the Mediterranean basin. The effects produced by sickle-cell anemia cause a weakening of the red blood cells. They are fragile and easily broken, and cannot be replaced as quickly as they die (Cummings 1991:73). Therefore, this makes sickle-cell anemia quite lethal. Most individuals that have sickle-cell anemia die in childhood, or at the latest, in adolescence (Cummings 1991:74).

It is, therefore, not surprising that the infant with this affliction at Kephala died in infancy. But sickle-cell anemia is also linked to another disease, malaria. Sickle-cell anemia has, as a characteristic, the side-effect of making the person immune to malaria. However, it is not a simple dominant/recessive trait. An individual who is a carrier (As) of sickle-cell anaemia will prove to be mildly anaemic, and there is low to no malarial morbidity of these individuals in populations living in a malarial environment. However, if the individual is a recessive homozygote (ss) sickle-cell anaemic is fatal, regardless of the environment is normal or malarial.

	Normal Environment	Malarial Environment
AA	normal	normal - high malarial morbidity
As	mildly anaemic	mildly anaemic - low to no malarial morbidity
ss	highly anaemic - usually fatal	highly anaemic - usually fatal

Angel (1950, 1964; 1966; 1967; 1969; 1972; 1975, 1978, 1984) has repeatedly suggested that these abnormal alterations in the bony structure of the skeleton - termed porotic hyperstosis - was a result of thalassemia or sickle-cell anemia, which developed in resistance to endemic malaria. Perhaps this is why the infant clearly shows evidence of porotic hyperstosis. Occasionally, recessive homozygote (ss) individuals would appear in the population, and they would most likely die in infancy or very early childhood.

[5] Some examples are the Thule from Alaska, the Yanomamo from the Amazon Basin, and the North American Plain Indians.

Appendix Table 9.1. Description of the mortuary assemblage at Kephala.

Artifact #	Grave #	Assoc Individual	Category	Type	Quality	Source	Microlocation	Age-Sex
Uncatalogued	1	1.22	Wood?	box?	decomposed	local manufacture	in situ/in grave	Undiff adult
107	2	2	Terracotta	crucible	fragment	local manufacture	disturbed/in situ/in grave	infant male?
127	4	4	Terracotta	female figurine	complete	local manufacture	above grave	adult male
128	4	4	Terracotta	perforated figurine/necklace?	head	local manufacture	above grave	adult male
97	8	8	Pottery	large jar (Type B2)	complete	local manufacture	in situ/in grave	infant female?
98	9	9.12	Pottery	incised scoop (Type C1)	handle	imported (south?)	at knees	adult female
99	10	10	Pottery	bowl (Type A1)	black-red on buff	local manufacture	NW corner	adult female
10.1*	10	10	Stone	"pillow"	complete	not determinable	near/under skull	adult female
112	11	11	Stone	obsidian blade (Type 1A)	complete	imported (Melos)	above grave	adult male
114	11	11	Stone	obsidian blade (Type 1A)	complete	imported (Melos)	disturbed/in situ/in grave	adult male
121	11	11	Stone	obsidian blade (Type 1A)	complete	imported (Melos)	~ N side	adult male
Uncatalogued	12	12.1	Stone	obsidian blade (Type 1B)	complete	imported (Melos)	disturbed/in situ/in grave	subadult female
124	12	12.1	Stone	obsidian scraper (Type 3)	complete	not determinable	N side	subadult female
Uncatalogued	13	13.1	Stone	obsidian blade (Type 1B)	fragment	imported (Melos)	disturbed/in situ/in grave	adult female
119	13	13.1	Stone	obsidian blade (Type 1A)	complete	imported (Melos)	above grave	adult female
102	13	13.1	Pottery	incised scoop (Type C1)	complete	imported (south?)	SE corner	adult female
Uncatalogued	14	0	Pottery	incised scoop (Type C1)	fragment	imported (south?)	in situ/in grave	unknown
111	14	0	Stone	flint tool	complete	local manufacture	E side	unknown
108	15	15	Terracotta	vessel/crucible?	fragment	local manufacture	above grave	unknown
117	15	15	Stone	obsidian blade (Type 1A)	chipped	imported (Melos)	S side	unknown
103	20	0	Stone	marble "rhyton"	chipped	not determinable	disturbed/in situ/in grave	unknown

Appendix Table 9.1 con't.

Artifact #	Grave #	Assocind	Category	Type	Quality	Source	Microlocation	Age-Sex
109	20	0	Stone	marble "rhyton"	complete	not determinable	under floor	unknown
110	20	0	Stone	flint tool	complete	not determinable	under floor	unknown
125	20	0	Stone	obsidian tool (Type 6)	complete	imported (Melos)	under floor	unknown
104	20	0	Pottery	bowl (Type A1)	burnt/scorched	local manufacture	NW corner	unknown
105	20	0	Pottery	large jar (Type B2)	fragment	local manufacture	west central	unknown
106	20	0	Pottery	cylindrical vessel (Type C2)	complete	local manufacture	west central	unknown
137	23	0	Pottery	large jar (Type B2)	complete	local manufacture	disturbed/in situ/in grave	unknown
139	24	24	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult female
140	24	24	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult female
141	24	24	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult female
142	24	24	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult female
138	27	·27	Pottery	small oval bowl	crusted red-on-white	local manufacture	disturbed/in situ/in grave	undiff juvenile
148	31	31	Pottery	large jar (Type B2)	complete	local manufacture	in situ/in grave	undiff infant
170	32	32	Pottery	large jar (Type B2)	complete	local manufacture	in situ/in grave	undiff infant
197	32	32	Terracotta	female figurine	complete	local manufacture	above grave	undiff infant
198	32	32	Terracotta	female figurine	complete	local manufacture	disturbed/in situ/in grave	undiff infant
171	34	34	Stone	marble bowl	complete	not determinable	disturbed/in situ/in grave	adult female
Uncatalogued	34	34	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult female
Uncatalogued	34	34	Stone	obsidian tool (Type 6)	waste	imported (Melos)	above grave	adult female
172	35	35	Stone	flint "tri-scraper"	worn	local manufacture	at knees	adult male
173	38	38	Pottery	incised scoop (Type C1)	chipped	imported (south?)	at knees	adult female
202	38	38	Terracotta	perforated figurine/necklace?	head	local manufacture	disturbed/in situ/in grave	Undifferentiated
203	38	38	Terracotta	crucible	fragment	local manufacture	disturbed/in situ/in grave	Undifferentiated
Uncatalogued	39	39	Stone	"pillow"	complete	not determinable	in situ/in grave	adult male
205	39	39	Stone	obsidian blade (Type 1A)	complete	not determinable	above grave	adult male
207	39	39	Stone	obsidian tool (Type 6)	complete	not determinable	above grave	adult male
208	39	39	Bone	tool (ovicaprid metaphalange)	worked fragment	local manufacture	above grave	adult male

Appendix Table 9.2. Descriptions of the Tharrounia burials.

Grave #	Type	Shape	L	W	Depth	m^3	Floor	Wall Type	Special Features	Macrolocation	Mesoloction	MNI
1	built	circular	1.4	1.4	0.65	1.0006	none	slab-lined	none	cemetery	Group 1	2
2	built	circular	1.4	1.4	0.6	0.92363	none	slab/stone lined	none	cemetery	Group 1	1
3	built	circular	1.25	1.2		1.17859	rockbed	slab-lined	none	cemetery	Group 1	5
4	built	circular	1.15	1	1.25	1.13453	none	slab-lined	2 levels	cemetery	Group 1	5
5	built	circular	1.25	0.95	0.7	0.66523	none	slab-lined	none	cemetery	Group 1	4
6	built	circular	0.55	0.45		0.19635	none	slab-lined	none	cemetery	Group 1	5
7	built	circular?	unknown	unknown	unknown	unknown	unknown	unknown	unknown	cemetery	Group 2	1
8	built	circular	0.14	0.75		0.15653	none	stone-lined (2 sides)	none	cemetery	Group 1	3
9	disposal area		6	6.5		39				cave	Cave A	5
10	disposal area		6	6.5		39				cave	Cave B	unknown
11	disposal area		6	6.5		39				cave	Cave C	8

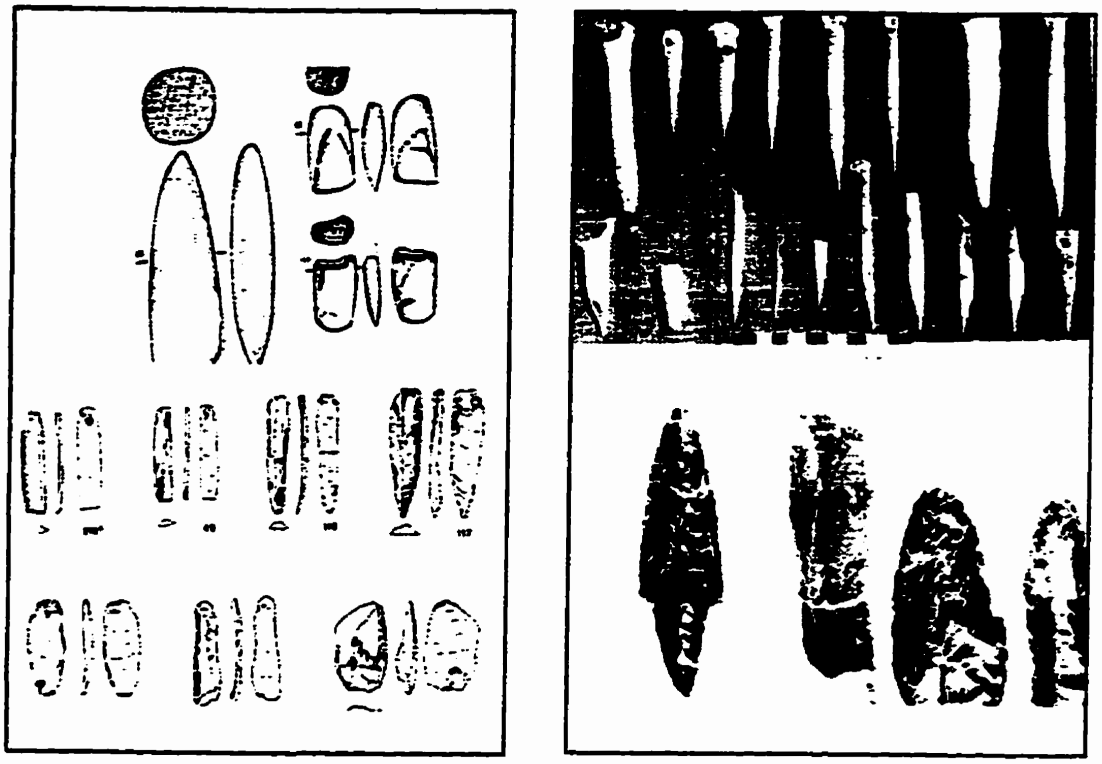


Illustration 9.1. Final Neolithic bone and stone tools. Left: Kephala . Source: Coleman 1977: Plate 10 [top], 70 [bottom]; Right: Tharrounia. Source: Sampson 1992: [top] Fig. 31, bone tools; [left] Fig. 32, obsidian blades; [right] Fig. 33, flint blades.

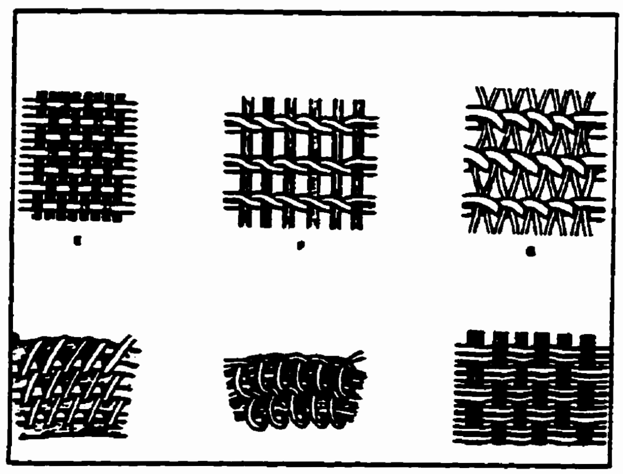


Illustration 9.2. Examples of Final Neolithic weaving. Kephala: (E) plain cloth weave; (F) simple twine matting; (G) split twine matting; (H, J) coiled matting; (K) plain-weave matting. Source: Coleman 1977:Plate 67.

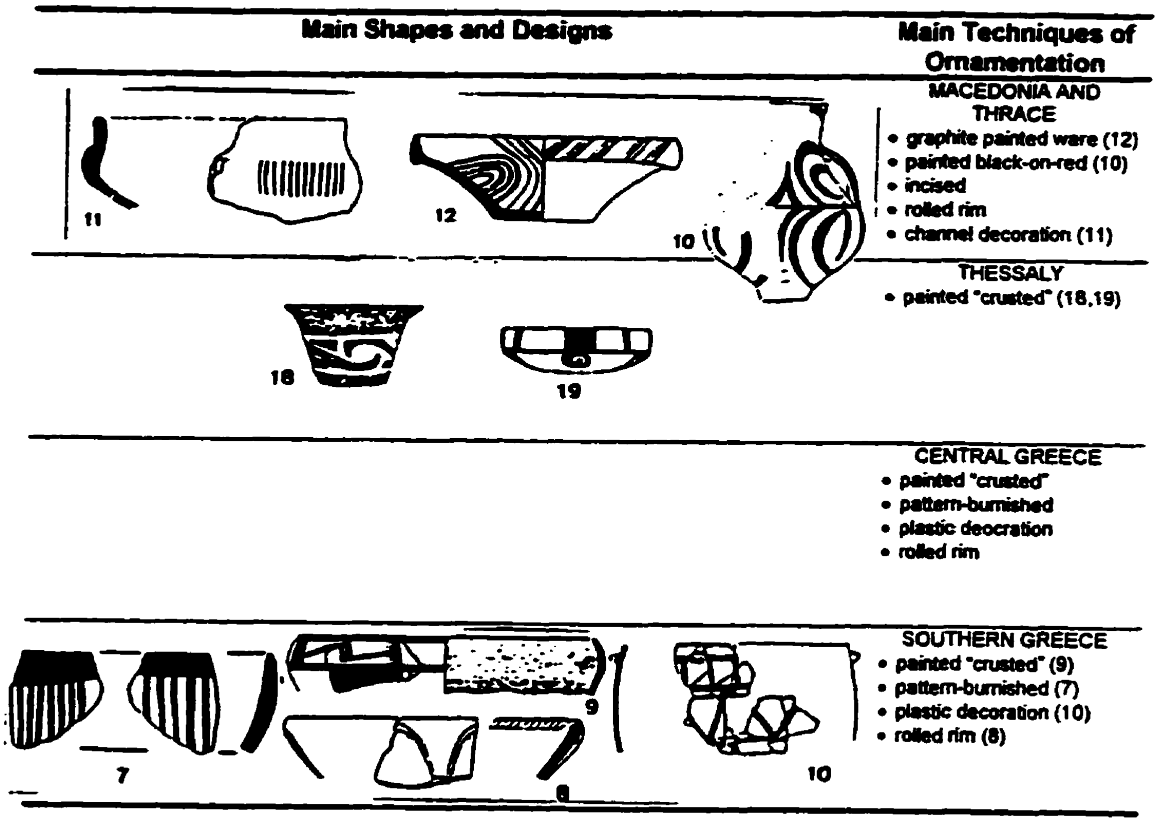


Illustration 9.2. The principle ceramics of the Final Neolithic period. Source: Demoule and Perlès 1993.

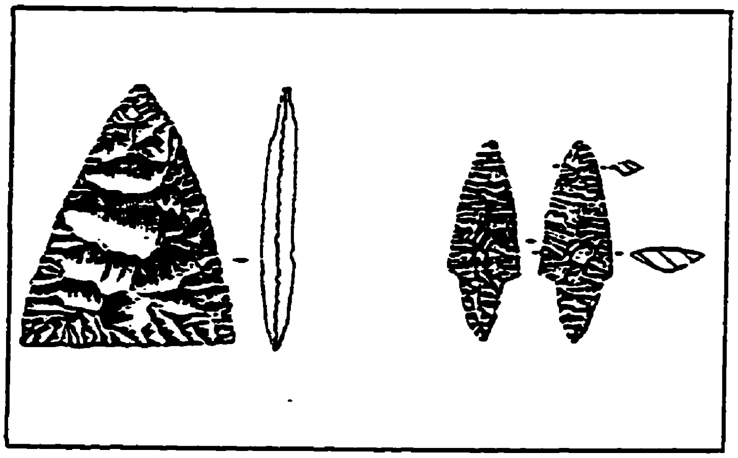


Illustration 9.4. Examples of Final Neolithic obsidian chipped stone blades from Tharrounia. Source: Demoule and Perlès 1993:Fig.6.

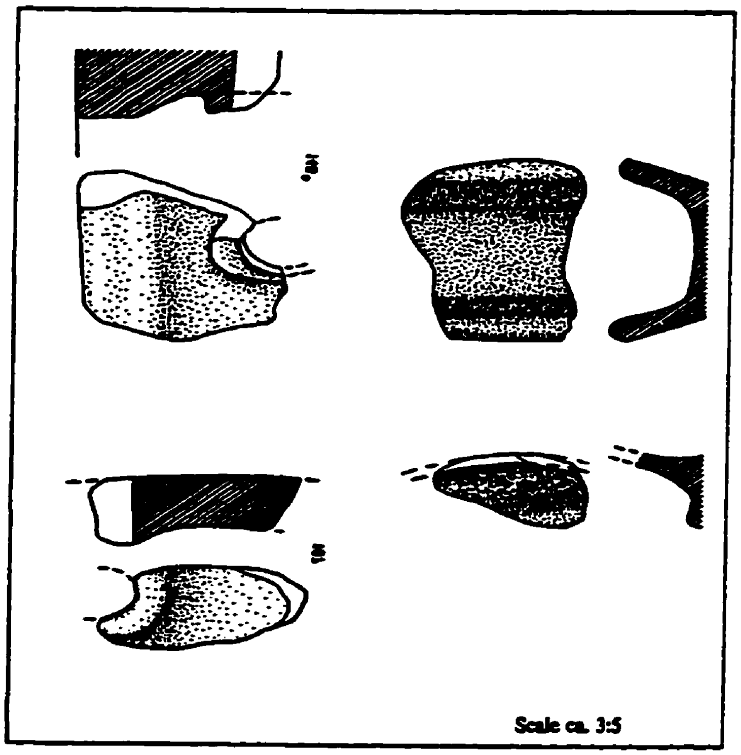


Illustration 9.5. Examples of Final Neolithic "crucibles" from Kephala. Source: Coleman 1977:Plate 22.

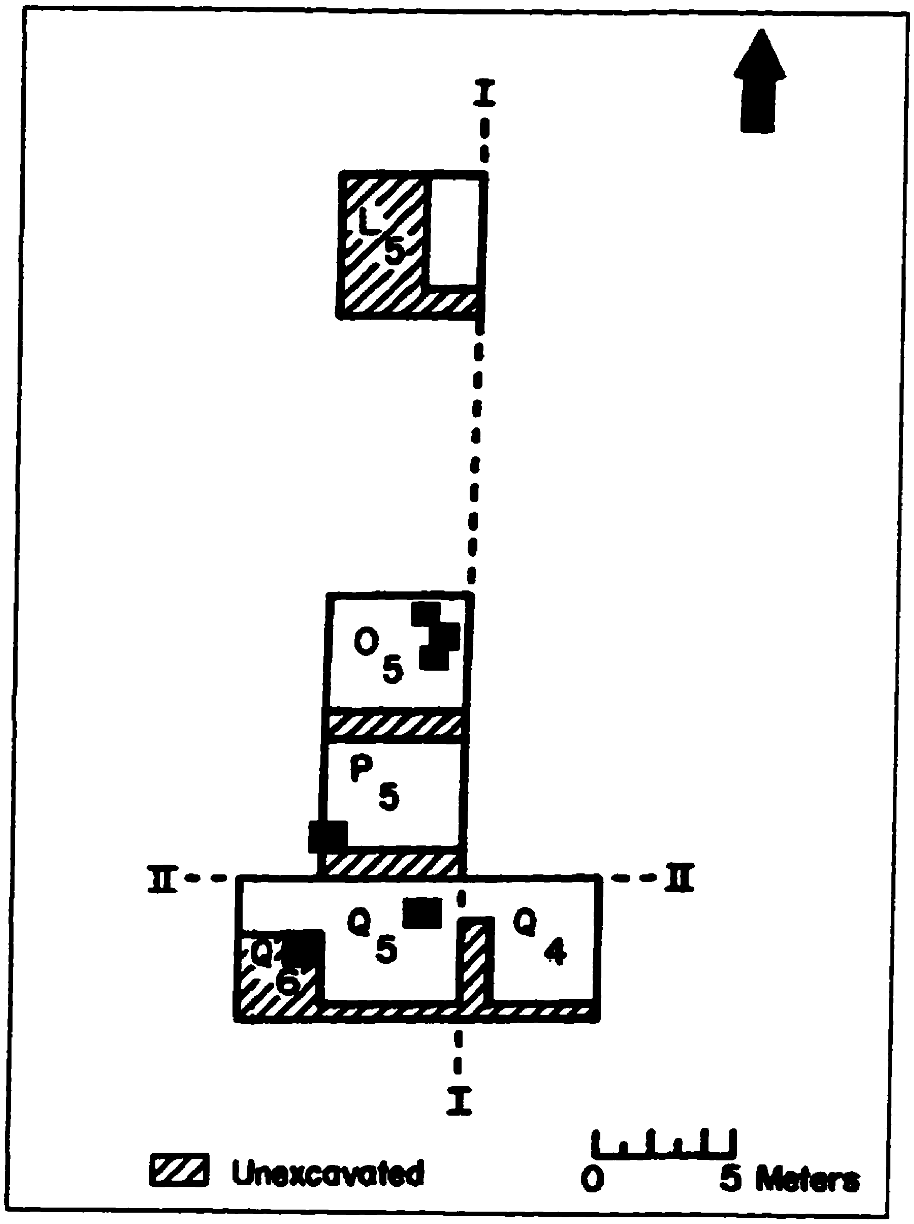


Illustration 9.6. The spatial distribution of the FN burials located on the Paralia at Franchthi Cave. Source: based upon Hansen 1991:Fig.

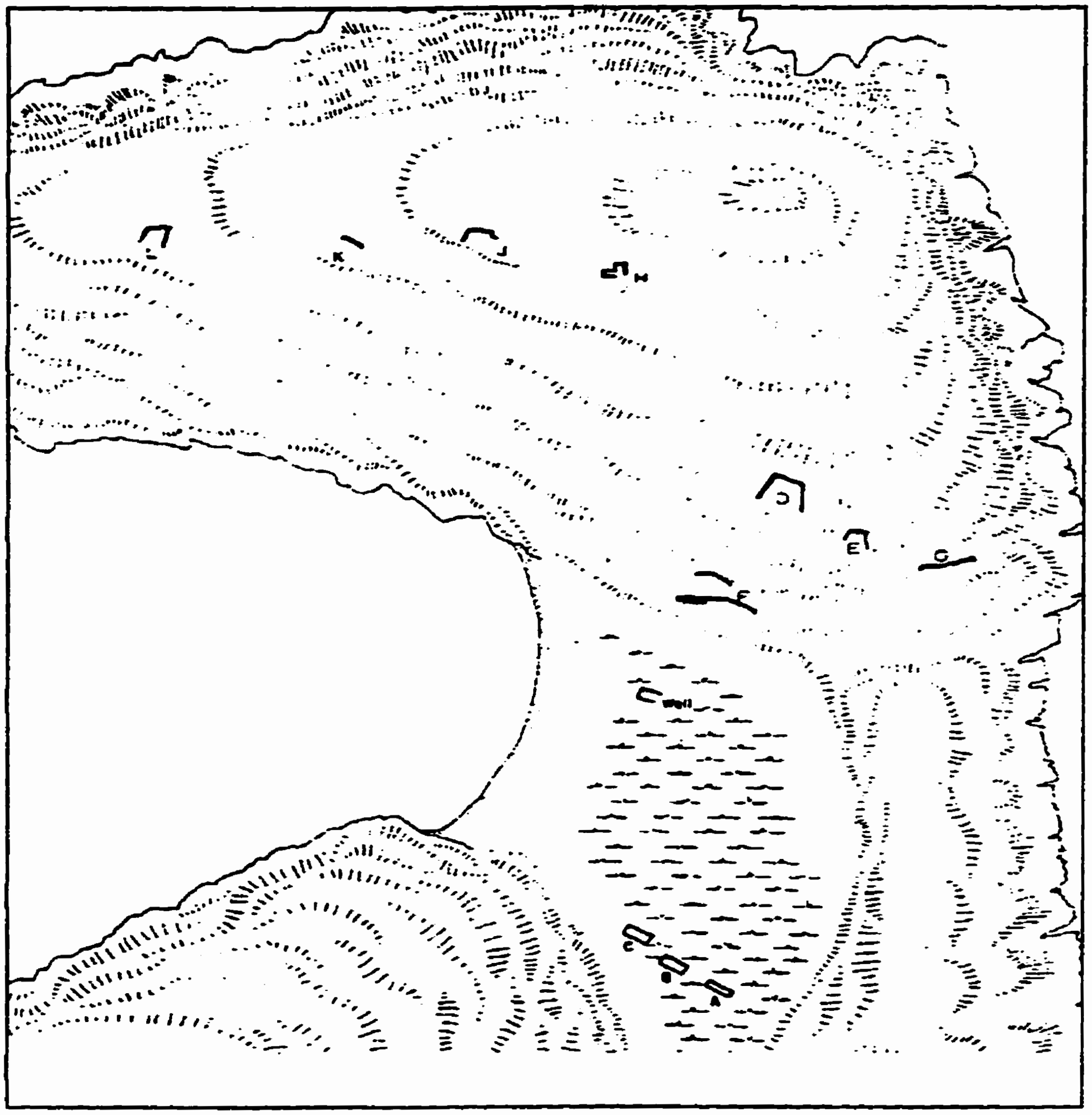


Illustration 9.7. Map showing the FN deposits on the northeastern headland of Kephala. Source: Coleman 1977: Plate 3.

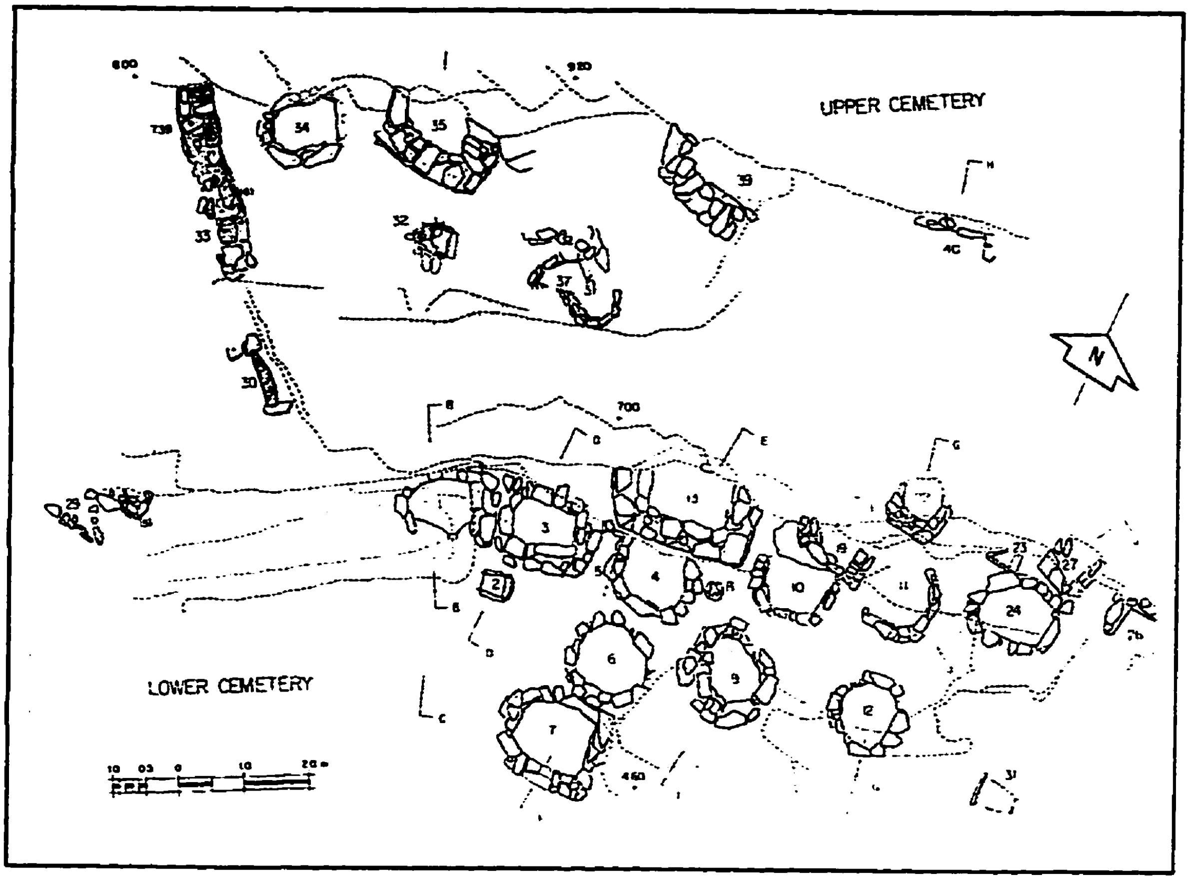


Illustration 9.8. Plan of the lower graves in the cemetery at Kephala.
Source: Coleman 1977:Plate 4.

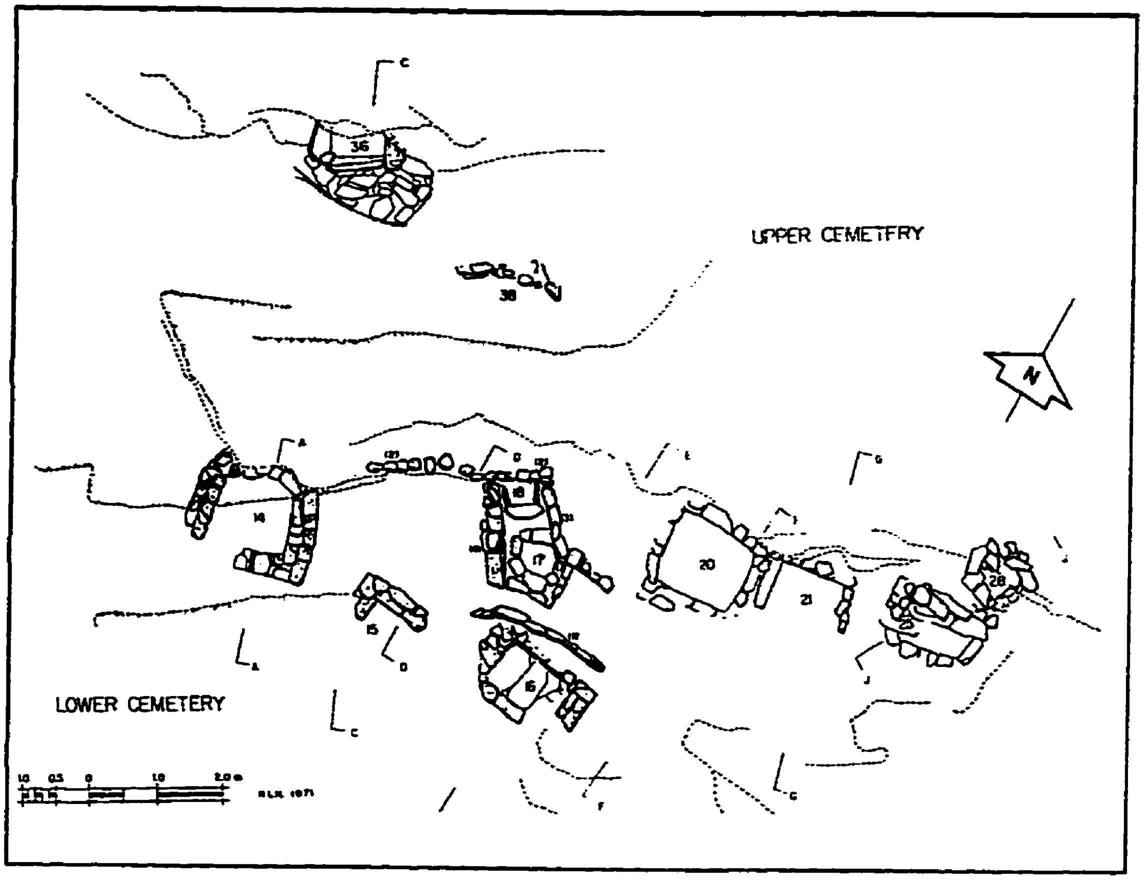


Illustration 9.9. Plan of the upper graves in the cemetery at Kephala.
Source: Coleman 1977: Plate 5.

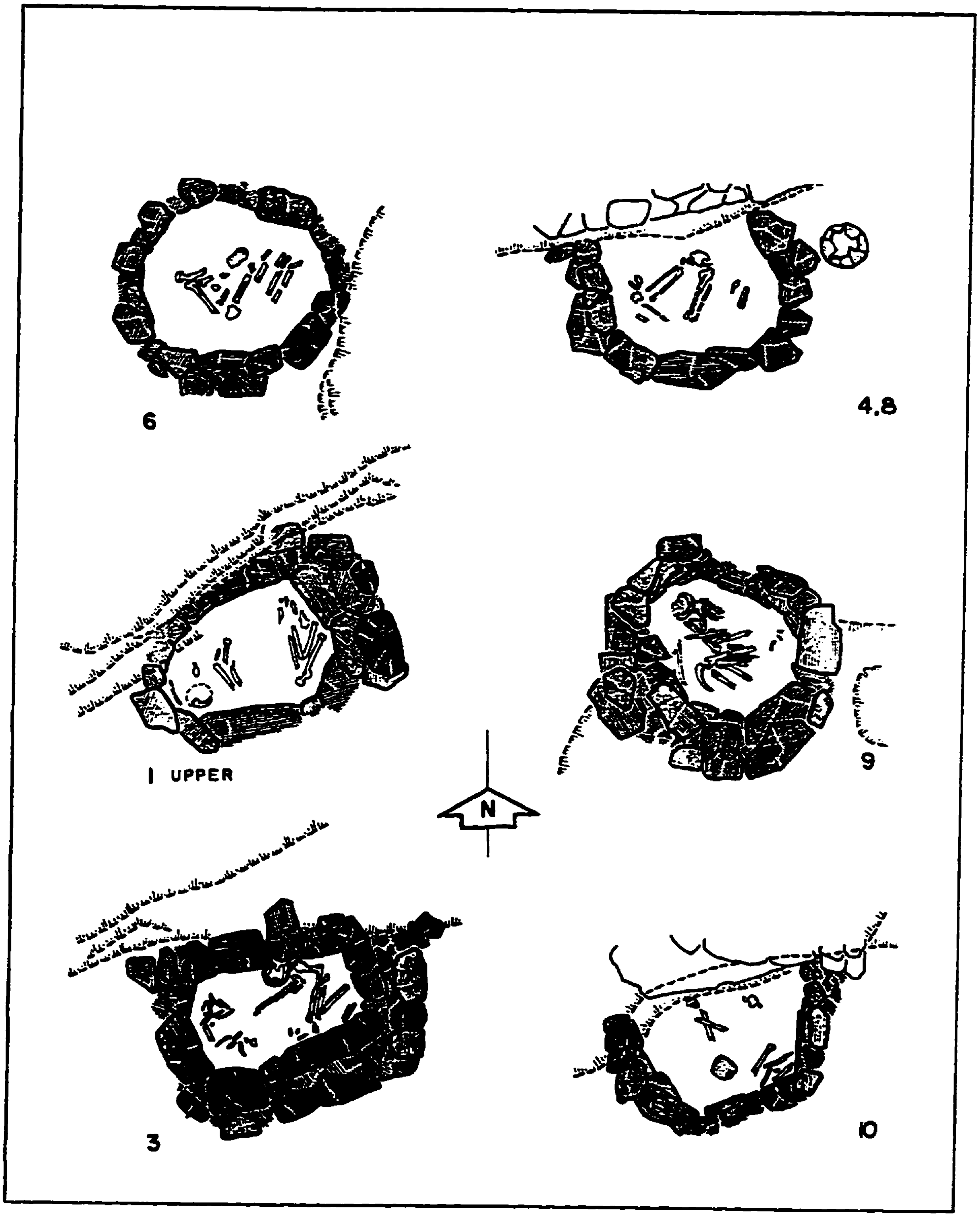


Illustration 9.10. Plan of the graves in the Kephala Cemetery. Source: Coleman 1977:Plate 16.

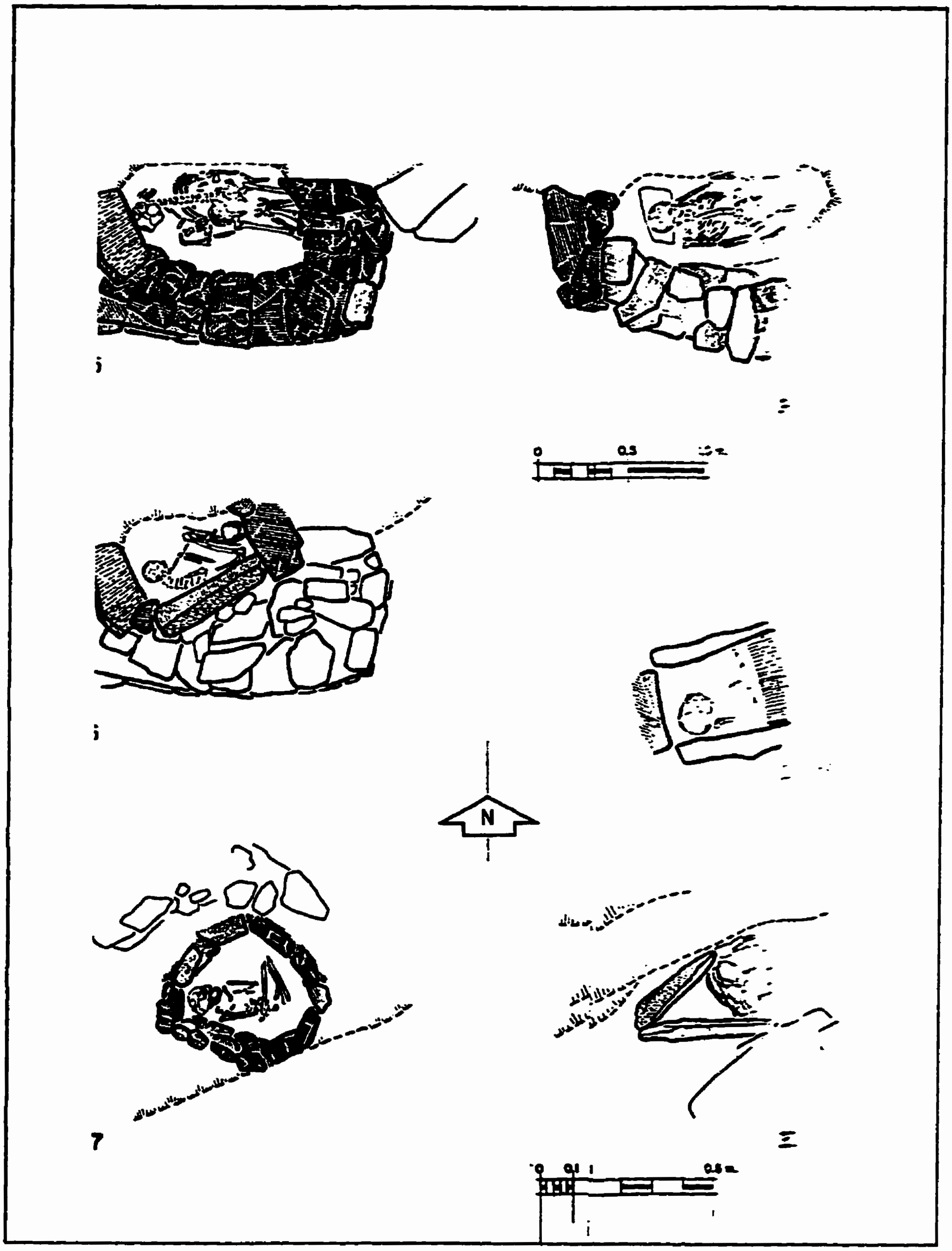


Illustration 9.10. con't. Source: Coleman 1977:Plate 19.

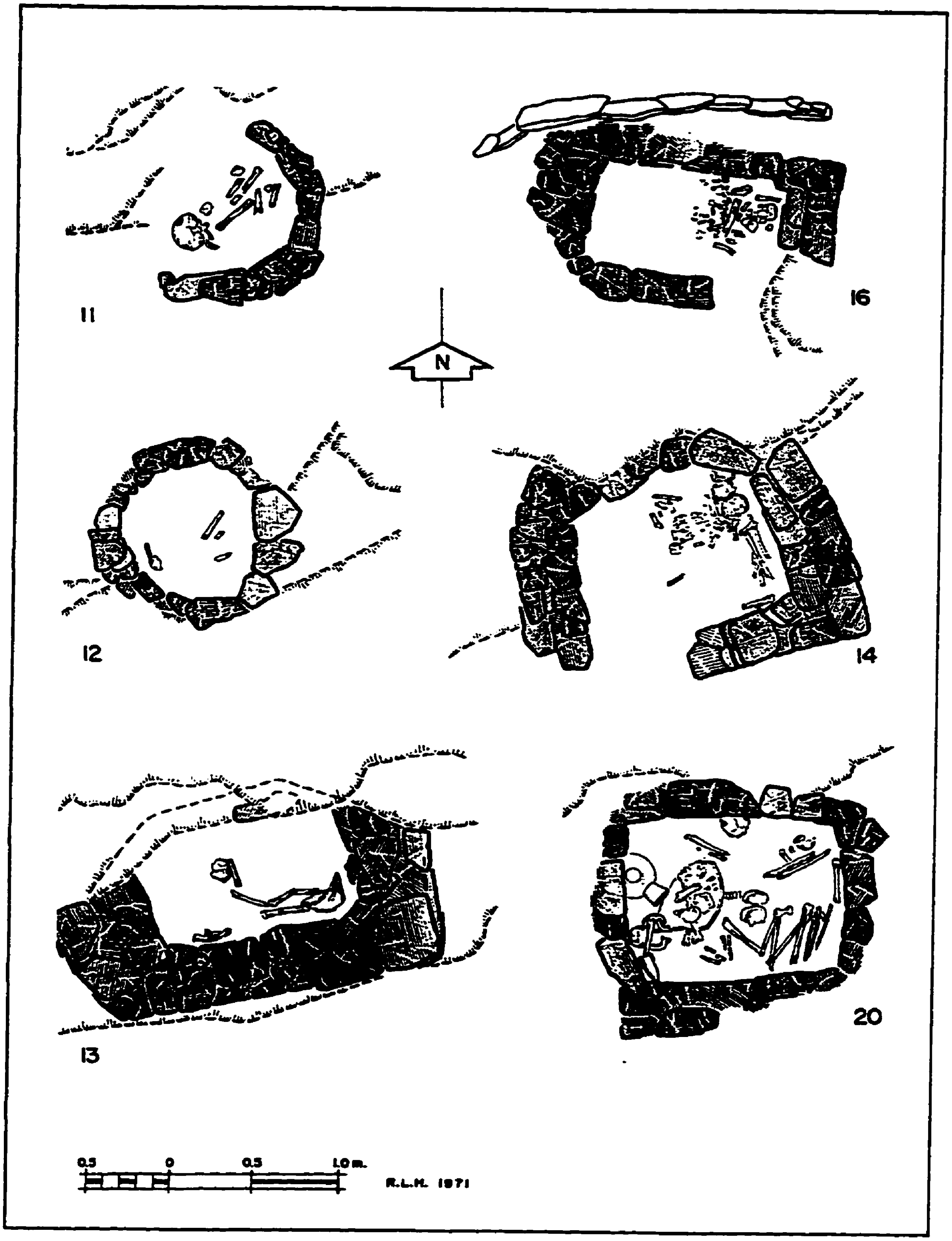


Illustration 9.10. con't. Source: Coleman 1977:Plate 18.

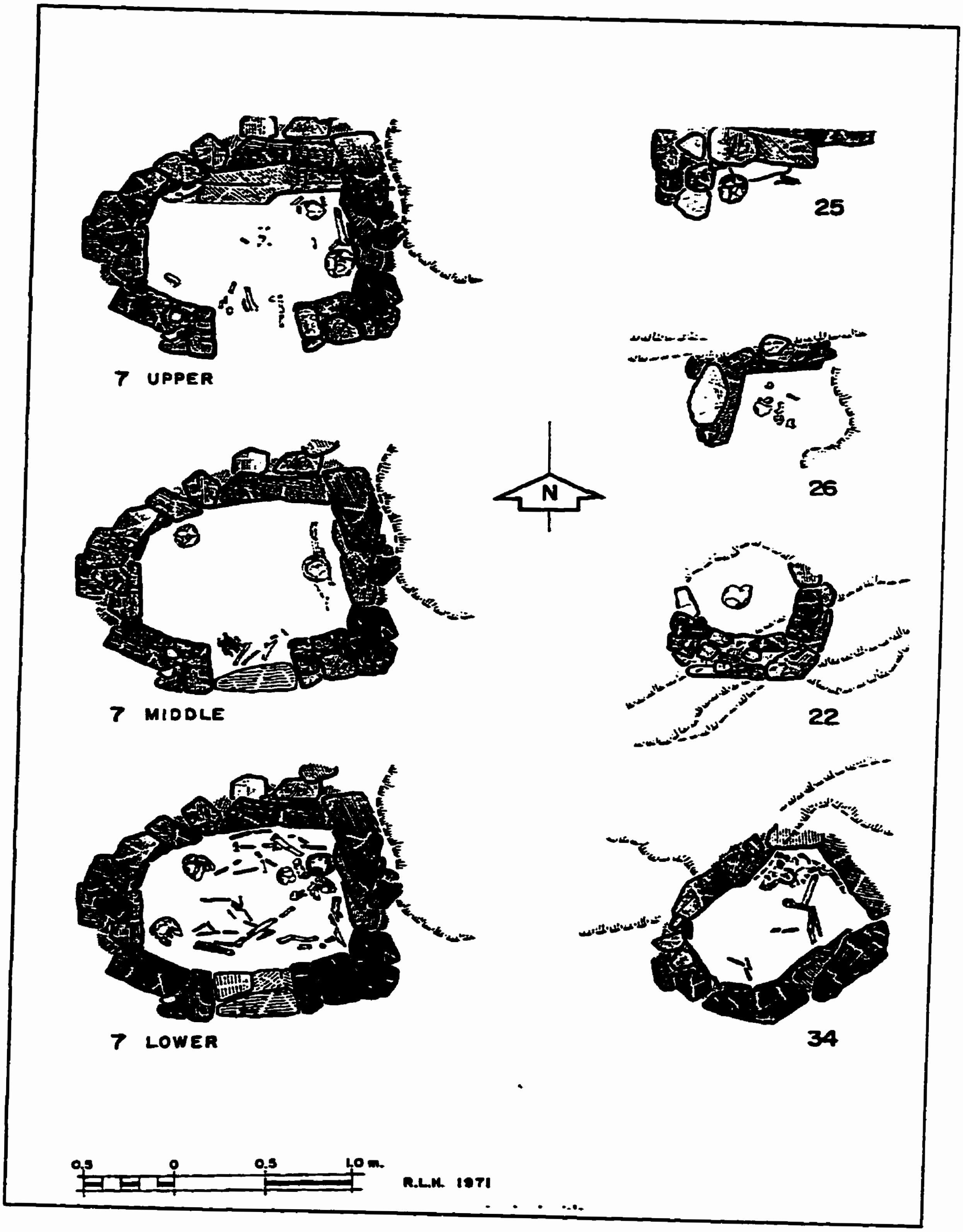


Illustration 9.10. con't. Source: Coleman 1977:Plate 17.

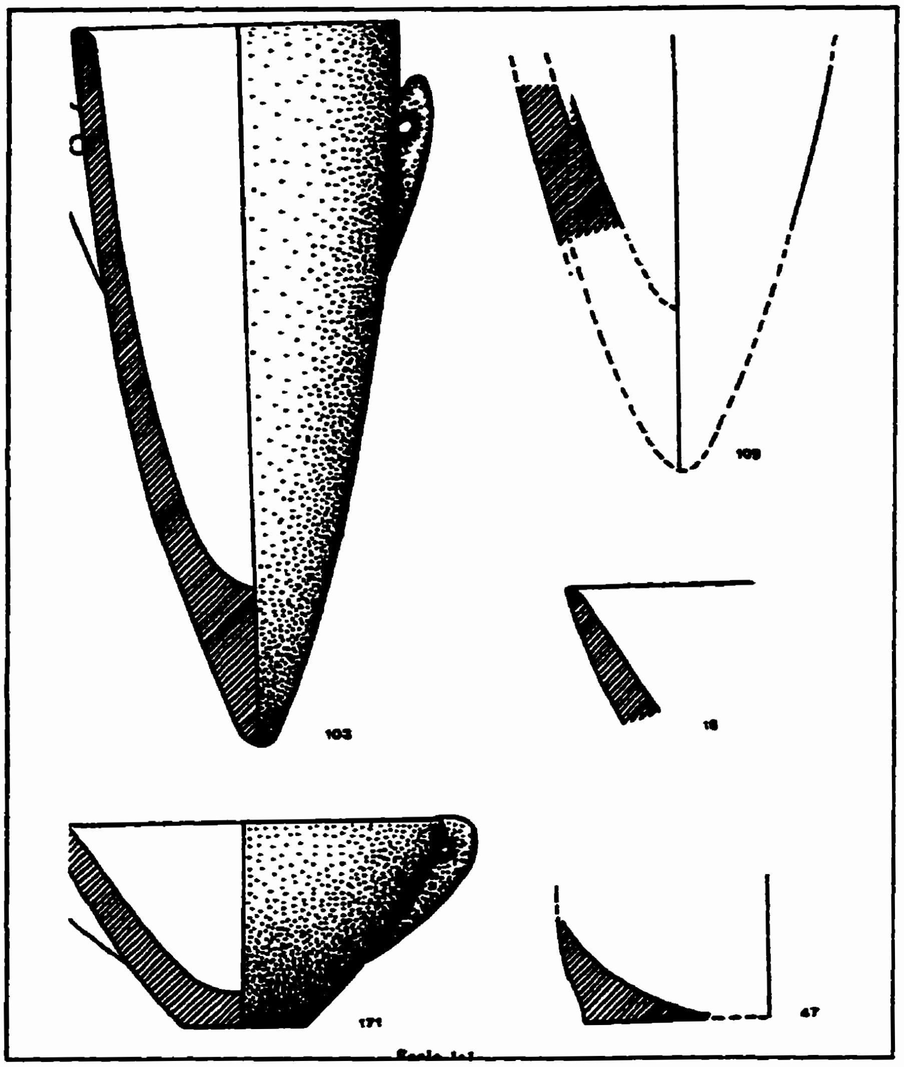


Illustration 9.11. Grave goods at Kephala: marble rhyton (top) and marble bowl (bottom). Source: Coleman 1977:Plate 23.

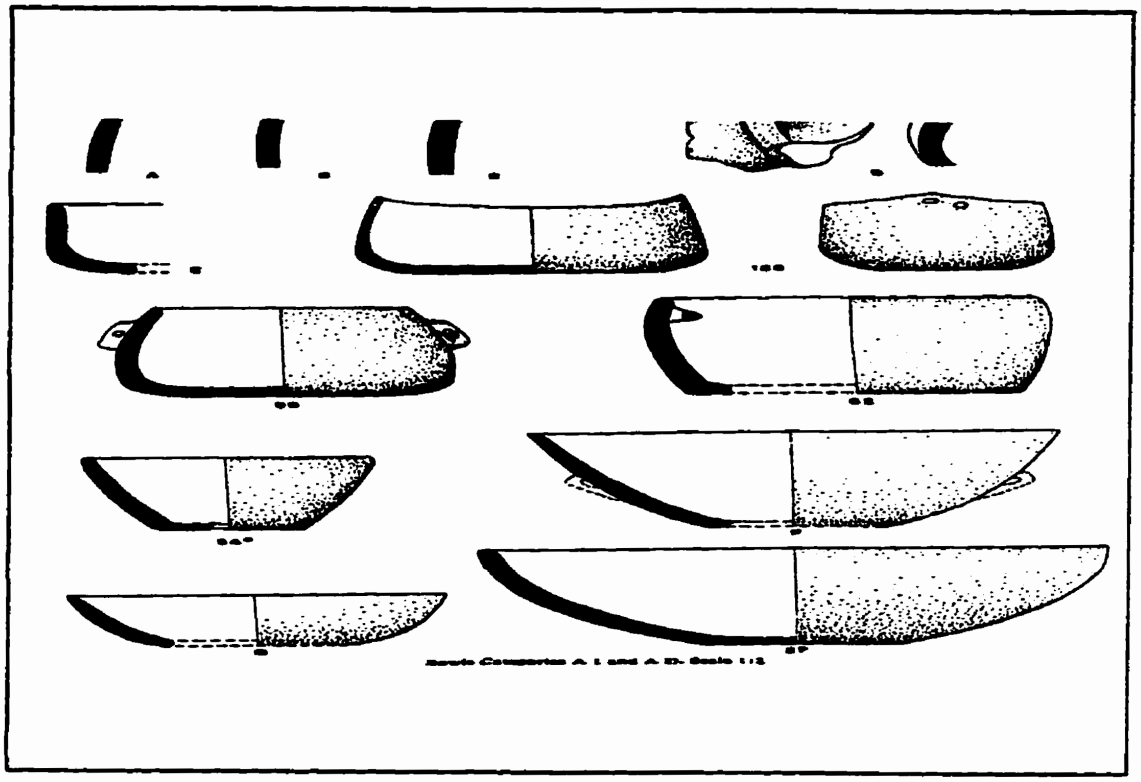


Illustration 9.12. Grave goods at Kephala: type of bowls found in the cemetery. Source: Coleman 1977: Plate 27.

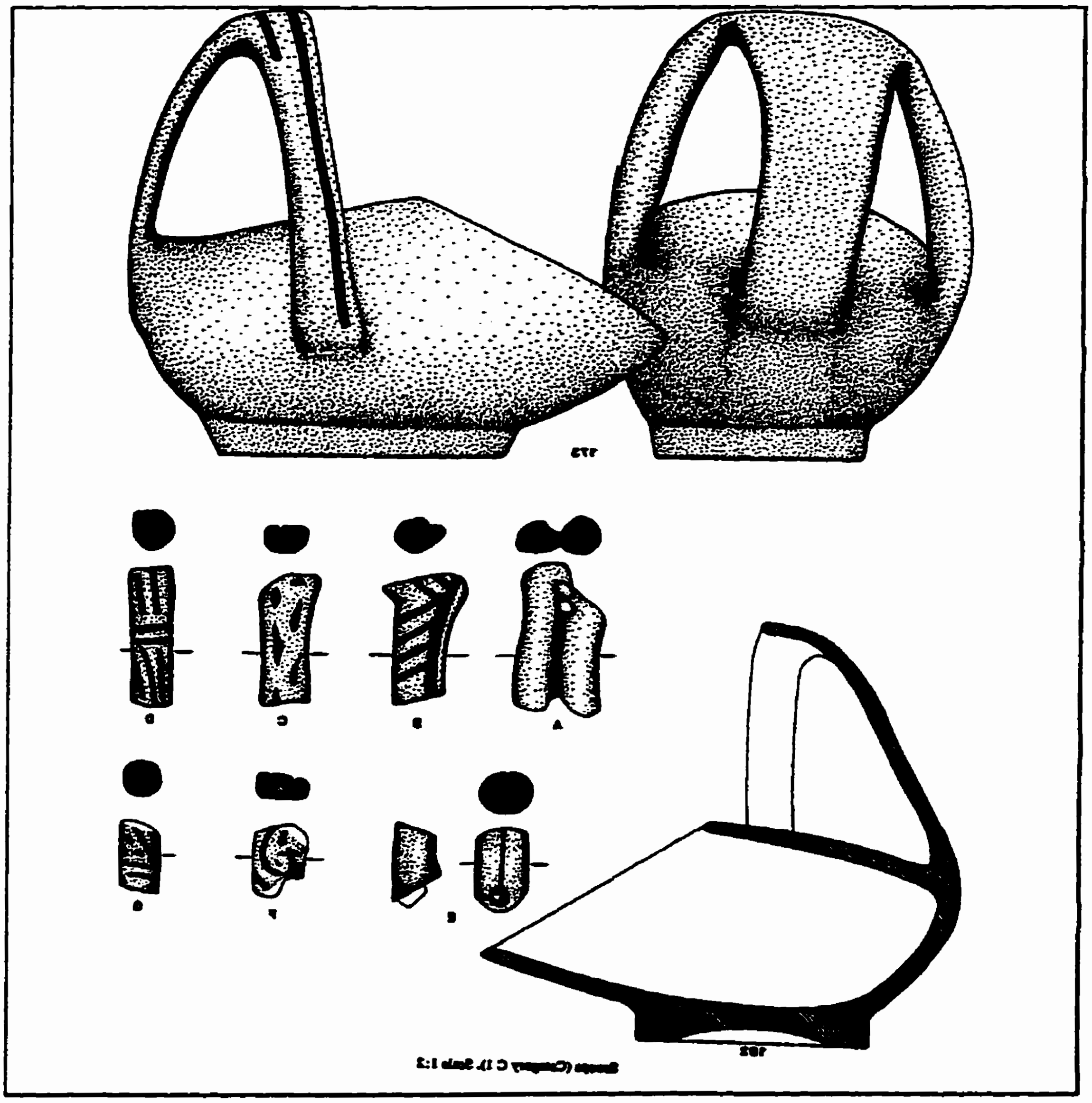


Illustration 9.13. Grave goods at Kephala: the C1 type scoops.
Source: Coleman 1977: Plate 33

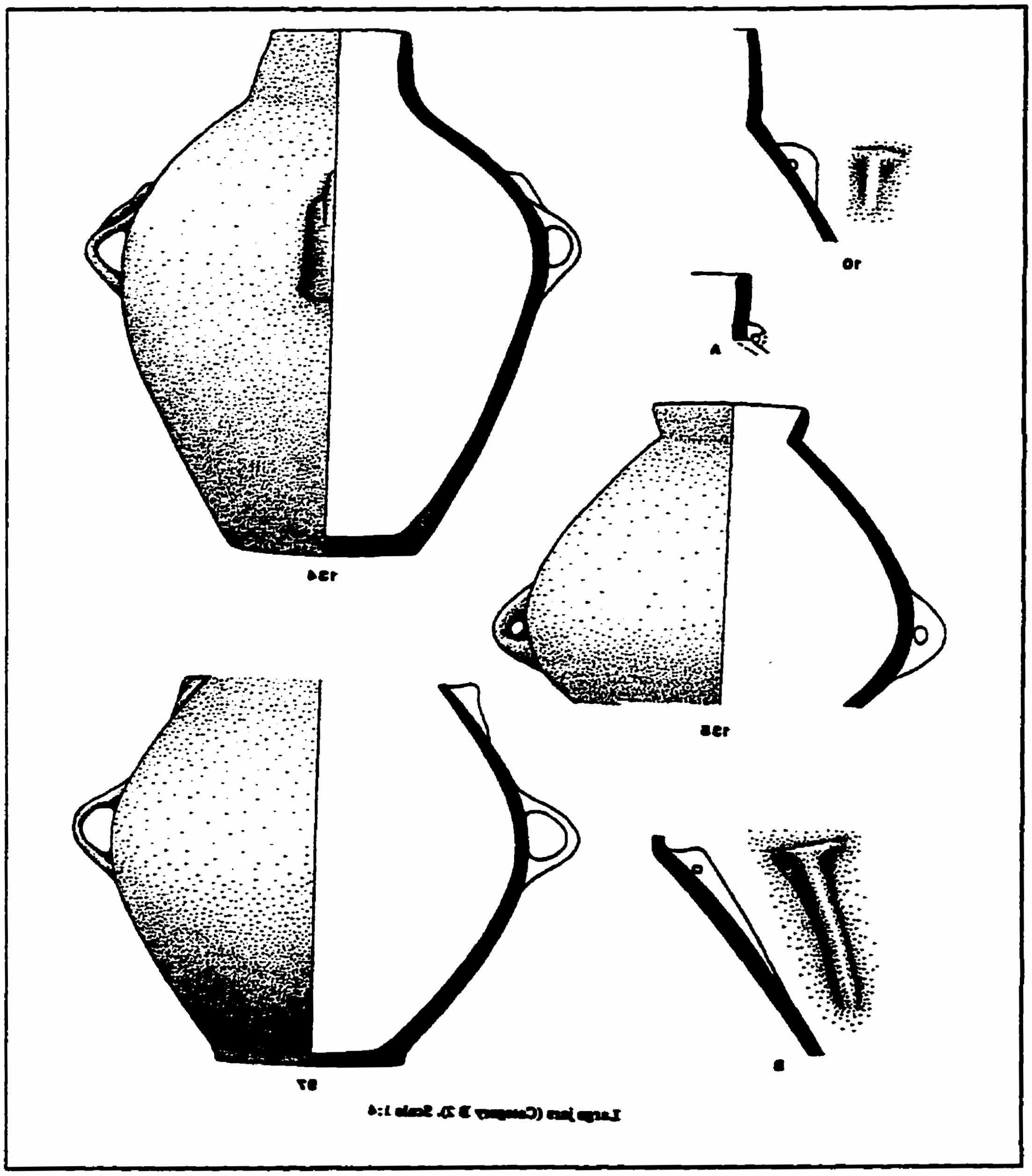


Illustration 9.14. Grave goods at Kephala: Large jars. Source: Coleman 1977: Plate 36.

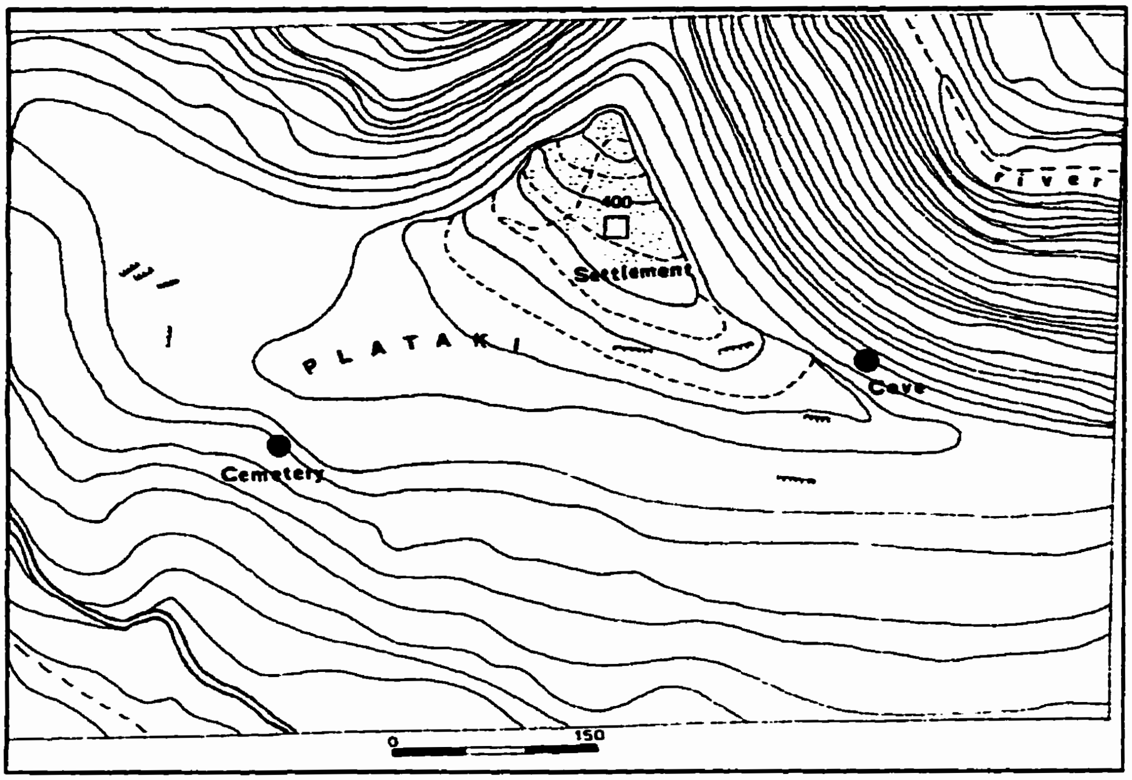


Illustration 9.15. Map showing the location of the cemetery, cave, and settlement at Tharrounia. Source: Sampson 1992: Fig. 2.

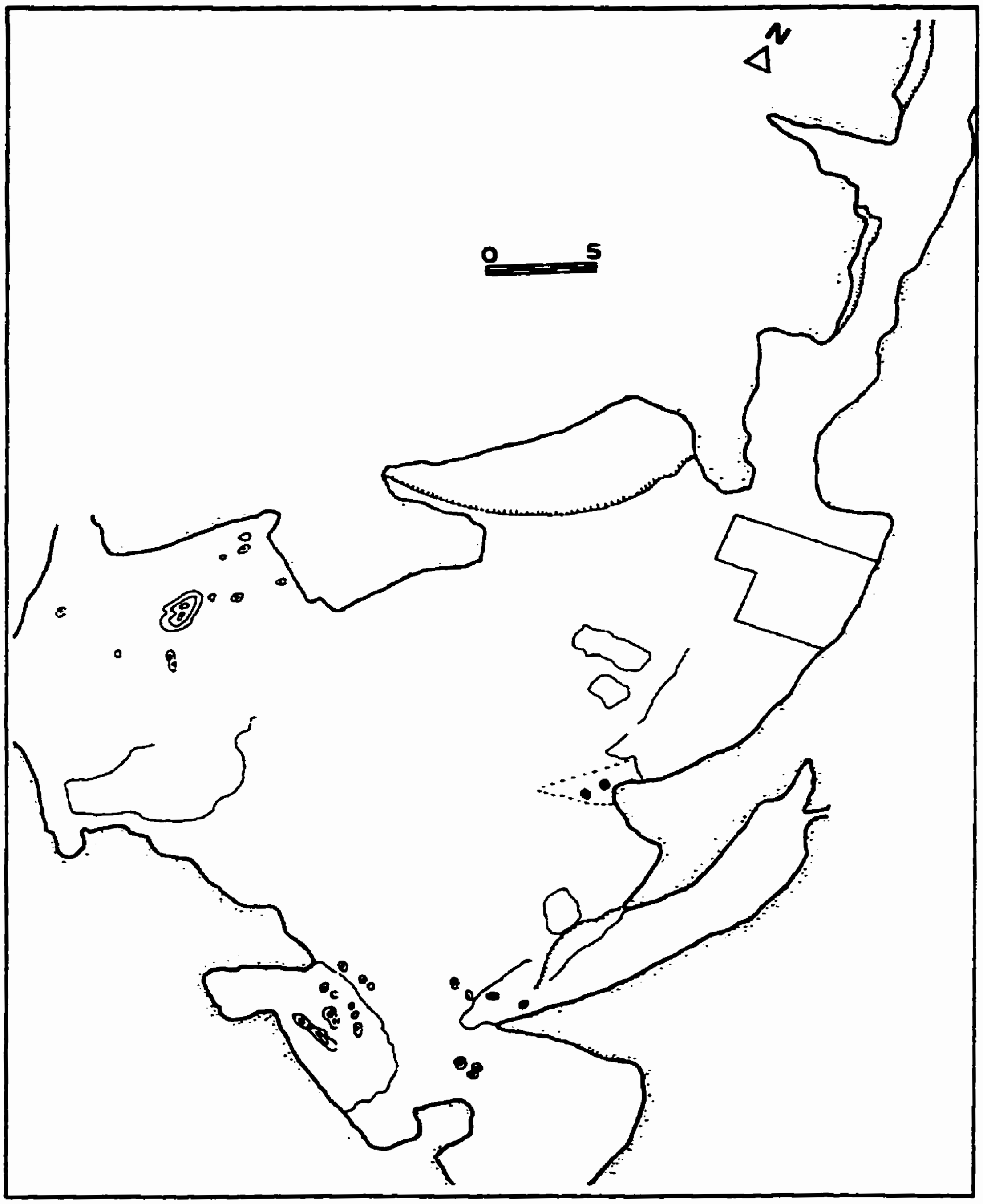


Illustration 9.16. Map of the interior of Skoteni Cave. Source: Sampson 1992: Fig. 4

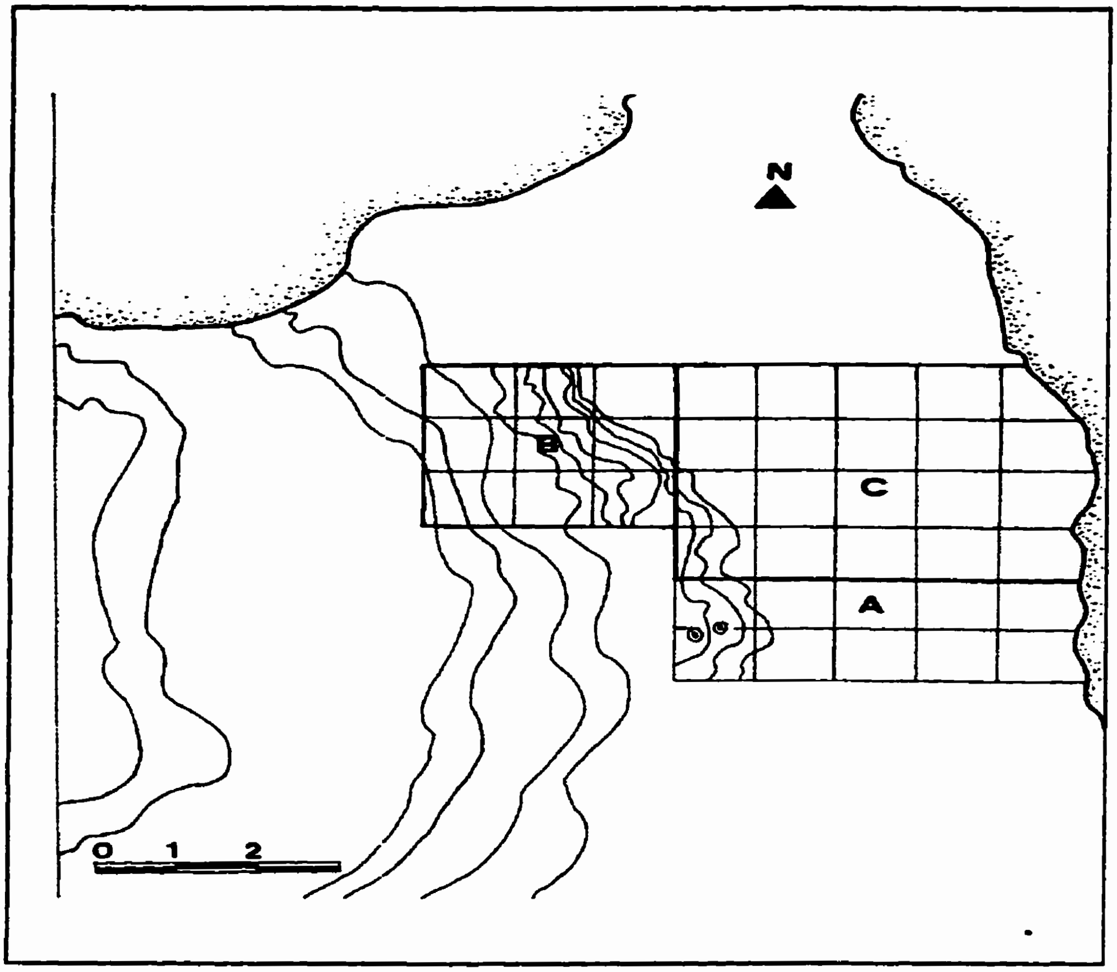


Illustration 9.17. Excavated area in the cave where the skeletal remains were recovered. Source: Sampson 1992: Fig. 5.

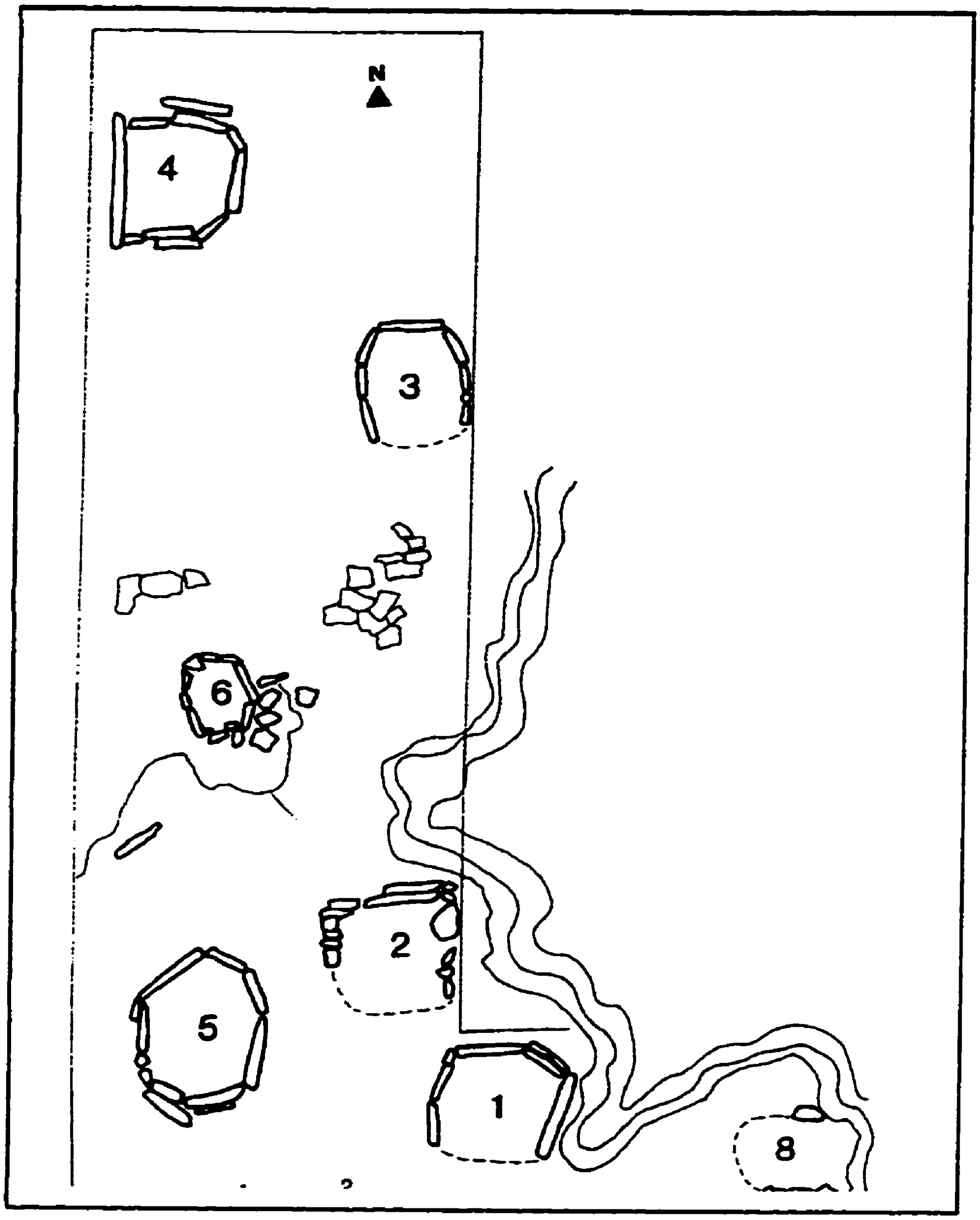


Illustration 9.18. The Group 1 graves (FN cemetery) of Tharrounia. Source: Sampson 1992: Fig. 35.

PART III

MORTUARY VARIABILITY AND SOCIAL CHANGE

CHAPTER 10

INEQUALITY, VARIATION AND CHANGE

I. Introduction

Two hypotheses about society have been suggested by earlier research on the Greek Neolithic. The first hypothesis concerns the nature of society during the Neolithic. Most authorities have insisted that a pervading ideology maintained egalitarianism throughout most of the Neolithic (cf. Demoule and Perlès 1993:406; Warren 1980; Jacobsen and Cullen 1981; Cullen and Talalay 1995). Egalitarian social organization is implied by the absence of monumental settlement and burial architecture, complex material culture, and centralized hierarchical settlement pattern in the Neolithic. These features strikingly contrast with the rest of southeastern Europe during the Neolithic. They also contrast with the Early Bronze Age period. The second hypothesis relates to the spatial and temporal distribution of material culture during the Greek Neolithic. There is a growing body of evidence to suggest that, like the later EBA, Neolithic societies were regionally organized. Demoule and Perlès (1993:406) have argued that the Neolithic can be defined by regionally distinct settlement patterns and production and exchange systems. This regionalism is argued to be most visible by the Late Neolithic period. These authors have also argued that there is regionalism in the funerary patterns of the Neolithic. I have suggested earlier that this regional character should be apparent in the social data.

In the present chapter I discuss the evidence as it relates to these two hypotheses. In the first section below I address the evidence for social inequality and heterogeneity during the Greek Neolithic phase. In the second section, I outline the temporal and regional variation in mortuary practices and society during the Greek Neolithic. This data will be discussed as it relates to hypotheses regarding endogamous or exogamous social development during the Neolithic.

II. Evidence of Inequality and Heterogeneity

A. Individual Social Differentiation

Individual social differentiation is most strongly suggested by the detection of social ranking. Social ranking was initially observed in the Early Neolithic society at Souphli Magoula in Thessaly. A similar mortuary pattern was also observed at the site of Prosymna in the Argolid. However, because the sample from Prosymna is small, rank differentiation can only be implied and not suggested with confidence. Social ranking is also observed during the Late Neolithic (Zarkou), and the Final Neolithic (Tharrounia and Kephala).

During the Neolithic, rank differentiation was not observed in the mortuary activity at cave sites. Only open-air disposal areas showed strong positive evidence for rank differentiation. One explanation may be offered for this pattern. In the Neolithic, caves were generally sites of temporary, but repeated occupation. It follows that few deaths would occur during any one occupation of the site. This is evidenced by the low frequency of skeletal remains in the cave disposal areas. Any detection of social ranking is inhibited by the number of individuals holding positions of social rank or status.

Therefore, the demographic reality of these mortuary populations prevented an adequate evaluation of rank differentiation.

A second individual social difference is exemplified by the special treatment of the dead. The mortuary practices that define special treatment did not radically deviate from the normative mortuary treatment. An elevated social status position is suggested by high levels of energy expended in certain individual's mortuary treatments, and differences in formal treatment and grave goods. It is most likely that this status position was based upon prestige gained through the exemplary skills of the individual.

As well as the elevated social positions, non-normative treatment also indicates some special distinction was given the dead. I proposed that special distinctions were based upon the circumstances of the individuals' death, deviant behavior, or by actions not related to specific social standing in life.

Social inequality is also evidenced by disparities in the frequency and types of grave goods given individuals. This social distinction occurred only at sites in Thessaly. Both Souphli Magoula and Plateia Magoula Zarkou exhibited status differences based upon disparities in the frequency of grave goods. A pattern like this is often interpreted as symbolizing achieved or ascribed wealth (e.g., Randsborg 1974; Shennan 1975; Peebles and Kus 1977; Frankenstein and Rowlands 1978; Orton and Hodson 1981). However, it is possible that these goods belonged to family members of the dead, and they do not represent the individual's actual possessions. It also unlikely that access to resources and goods was that differentiated in these societies. There is only evidence to suggest groups had access to different resources and goods, not individuals. Therefore, it is most likely that the disparities in frequencies of grave goods represents a contribution to the mortuary ritual by people who had entered into relationships with the individual. Again, this practice is a symbol of the level of prestige and influence achieved by the individual.

This analysis revealed that non-adults were often dispersed throughout all rank levels in the society. This suggests that social rank was not only attained by the efforts of the individual (e.g., elevated positions), but was also ascribed to individuals upon their birth. I suggest that this pattern indicates the hereditary ascription of social rank. Evidence of the hereditary ascription of rank suggests that duties were specialized in the society. However, there is little indication that specialization did not extend beyond occupation or leadership. There is no indication that these societies fell under the leadership of a hereditary ruler. Rather, it is more likely that higher rank and status was assigned to individuals who belonged to a group of elders. The prestige of this status probably reflected upon these individual's families. In any case, prospective leaders would have had to earn social positions such as these, and were not assigned to them because of their lineage.

B. Social Group Differentiation

The evidence of distinct social groupings is often evaluated by studying the spatial properties of mortuary remains (Saxe 1970, 1971; Goldstein 1976, 1980, 1981; Charles and Buikstra 1983; Chapman 1981). The method used in this thesis attempted to define group social differentiation by investigating constraints in the spatial properties of the disposal areas. This analysis concentrated upon the spatial properties of the age and sex structure, formal and symbolic treatment, artifact distribution, and energy expenditure levels. Using this approach four horizontal social distinctions were defined: 1) corporate group membership, 2) occupational or social membership; 3) age statuses; and 4) sex statuses.

Corporate group membership was positively indicated by the spatial segregation of the dead with a disposal area, and by the separation of disposal areas from habitation areas. Even the more poorly documented funerary samples showed that formal areas were used to dispose the dead. Only one site has any evidence for the existence of more than one corporate group. At Tharrounia, I suggested that this area was inhabited by different social groups during different seasons, and that they each buried their dead in the two exclusive disposal areas. I must suggest caution in this interpretation, however. The Group 2 graves were not well preserved, and this does little to strongly support or deny this proposal. Nevertheless, this stands as one likely explanation for this behavior.

The identification of occupational or social group membership was based upon identifying the differential allocation of artifacts in a cemetery. Only women were consistently found to have artifacts specifically assigned to them. These items are generally of a utilitarian nature, and would have functioned in the process of food preparation or manufacture of items such as pottery and clothing. There is little evidence to suggest that males were differentiated by their mortuary assemblage. It is more likely that male status differences were symbolized by more perishable items, and personal ornamentation that has not survived with time.

Females were also more often identified to age and sex statuses. Seldom are males allocated artifacts that would have served to differentiate them based upon age or sex.

However, the absence of goods, or other more perishable items, could possibly have served to distinguish males. It is also possible that males were not formally differentiated on purpose. The mortuary ritual may have been used as a way to symbolically represent homogeneous relationships between males, even though they did not exist in reality (cf. Ucko 1968). For example, this may have been the case at Tharrounia. Only at certain cemeteries, such as Zarkou, were males allocated specific grave goods, or large quantities of goods.

For males, analysis of artifact distribution was less successful in detecting social differences than evaluations of energy expenditures. The only case contrary to this was the detection of figurines found with adult males. This presents a problematic area of interpretation, because figurine imagery is usually associated with females (Cullen and Talalay 1995). Two possible interpretations of this behavior can be entertained. First, the finding of figurines with a male may suggest a religious specialist, such as a shaman. All the men found with figurines (two at Kephala and one at Tharrounia) had very low levels of energy expended in their mortuary treatment. It is not unusual for persons who hold positions of spiritual significance to receive non-normative mortuary treatments. This can symbolize both their importance to the community, as well as their exclusiveness. This may be because they deal with unknown and the aspects of life that others revere, but fear. The other possibility is that this behavior represents the social recognition of a gender inversion. Among the Azande (Evans-Pritchard 1970) and the Plains Indians, for example, a man who preferred the duties of women instead of the more dangerous activities of men could proclaim that he was really more a woman than a man. This did not always result in homosexuality or transvestitism. In either case, the social deviancy was an accepted part of Azande and Plains Indian social life.

III. Temporal and Regional Variation in the Greek Neolithic

This section discusses the classes of change that may occur in a mortuary complex through time and space. Below, I will summarize the evidence for systematic change through time and space. I will discuss the behavioral constraints of such change in the following chapter.

A. Temporal and Regional Variation in Mortuary Treatment

In the previous four chapters, the normative mortuary treatment was described for each site. In the following analysis, the normative treatment of the dead is tested for regional and temporal similarity by comparing twenty variables. Three variables have been dropped from the analysis because they fluctuate greatly from site to site and are not statistically significant (average volume, age-sex categories, and average grave gifts per interment). Below, I will first describe temporal similarity in mortuary treatment, followed by a discussion of the regional analysis. This discussion is based upon the data presented in the summary Table 10.1. The raw data for this table is listed in the Appendix Tables at the end of the chapter.

1. Temporal Variation in Mortuary Treatment

In the temporal analysis of normative mortuary treatment, four phases were considered: 1) Early Neolithic; 2) the Middle Neolithic transition (EN-MN + MN); 3) Late Neolithic; and 4) the Final Neolithic. For the purposes of comparison, the EN-MN

Franchthi remains were compared to the remains from MN deposits. The results of the temporal investigation are presented in Table 10.1 and Appendix Table 10.2.

The EN sample is composed of Souphli Magoula, Prosymna, and the EN-MN remains at Franchthi Cave (Appendix Table 10.2). None of the samples shows a very high degree of similarity. Even Prosymna and Franchthi Cave are not particularly homogenous (n=0.55). However, when comparing the EN-MN sample to the MN sample at Franchthi Cave, the two programs are highly similar (n=0.75). This shows there is a high probability that program directives were used over a long time at Franchthi Cave.

Phase	Site	Most Similar	Same Region	Same Phase
EN	EN Prosymna	Zarkou (0.7)	-	-
	EN Souphli	Zarkou (0.95)	+	-
	EN-MN Franchthi	MN Franchthi (0.75)	+	-
MN	MN Franchthi	EN-MN Franchthi (0.75)	+	-
LN	LN 1 Zarkou	Souphli (0.95)	+	-
	LN 2 Tharrounia	Tharrounia (0.6)	+	-
	LN Diros	Kitsos (0.6)	-	+
	LN Kitsos	Diros, Franchthi, Souphli (0.6)	+/-/-	+/-/-
FN	FN Franchthi	EN-MN Franchthi (0.75)	+	-
	FN Kephala	Tharrounia (0.75)	+	+
	FN Tharrounia	Kephala (0.75)	+	+

Table 10.1. Summary of spatial and temporal similarity in normative mortuary treatment during the Neolithic period.

During the Late Neolithic, the samples again do not show a high degree of similarity. Only Aleopotrypa Cave (Diros) and Kitsos Cave are similar. The dissimilarity of the LN remains is probably a result of location. None of these sites is very close each other geographically. This suggests that mortuary practices in the LN were more regionally distinct. Regionalism is also suggested by the settlement pattern during the LN (cf. Chapter 8).

A similar pattern is observed during the FN phase, where the island sites of Kephala and Tharrounia are very dissimilar to the remains from Franchthi Cave. It has been suggested that northern Greece is dissimilar overall to southern Greece during the FN (cf. Demoule and Perlès 1993). However, at least in terms of normative mortuary treatment, a degree of regionalism also existed in the south.

2. Regional Variation in Mortuary Treatment

The most northerly region, Region 1, includes the sites of Plateia Magoula Zarkou and Souphli Magoula. These two sites have very similar disposal programs (Appendix Table 10.1; n=0.95), matching on 19 of the 20 variables. Further, compared to the entire Neolithic sample, these two cemeteries are also most similar (Table 10.1). This suggests that there is similarity in the mortuary practices of this region.

The area of Region 2 includes the sites of Tharrounia, Kephala, and Kitsos. In this group, only Kephala and Tharrounia show a high degree of similarity (Table 10.1, n=0.75). These two sites are also most similar when the entire sample is considered. The LN disposal area at Tharrounia is most similar to the subsequent habitation during the FN phase. This disposal area has little similarity to any of the other disposal programs in the sample. Kitsos has very little in common with the normative treatment at either Tharrounia or Kephala. Rather, Kitsos appears to have characteristics more similar to Diros (LN), Franchthi (EN-MN), or Souphli Magoula (EN). This suggests that Kephala and Tharrounia may be better defined as a group. Unfortunately, the preservation of the sample from Kitsos does not permit a regional evaluation.

Region 3 contains the most sites, and includes Diros, Prosymna, and the three occupation levels of Franchthi Cave. As would be expected, the three occupation levels at Franchthi are most similar to each other (Table 10.1; n=0.75). The normative treatment of the dead at each occupation level is also most similar to each other even when considering the overall sample. Prosymna is very similar to the normative treatment at EN-MN and MN Franchthi (Appendix Table 10.1; EN-MN, n=0.55 and MN, n=0.60). However, when the entire sample is considered, Prosymna show greater similarity to the normative treatment practices at Plateia Magoula Zarkou (Table 10.1; n=0.70). The sample from Diros does not correlate with any of the other samples in this region. Overall, Diros is more similar to the normative treatment at Kitsos Cave (Table 10.1; n=0.60).

Overall, this analysis suggests there is regional congruency in normative mortuary treatment in the three arbitrary regions. Only the cave ossuaries do not fit well within each of the regions. This is probably a by-product of the poor preservation of the remains, and the limited range of inferences that could be made about the disposal program.

3. Summary

Overall, the normative treatment of the dead is defined by regional uniqueness. More often than not, sites from the same region show greater similarity than do sites from the same chronological phase. In sum, it appears that people did not change their mortuary practices through time. Instead, mortuary practices only changes across space.

Therefore, it is expected that the social distinctions exhibited by these societies should be characterized by regional rather than temporal uniqueness.

B. Temporal and Regional Variation in Social Distinctions

The Neolithic samples were compared for similarity in the social distinctions represented by the mortuary activity. In total, 13 different social distinctions were represented in the Neolithic. All sites were compared for similarity in these 13 distinctions, whether they were present or not, because these distinctions represent the range of social distinctions observable in the mortuary record for this period. The data for this discussion in presented in summary Table 10.2, and the appendix Tables 10.3-4.

1. Temporal Variation in Social Distinctions

A similar situation resulted from the temporal analysis of social distinctions. In the EN phase, the sites are more similar to other sites from the same region, rather than the same phase (Appendix Table 10.4, Table 10.2). The only other two sites that are similar are the Final Neolithic sites of Kephala and Tharrounia.

2. Regional Variation in Social Distinctions

In Region 1, Zarkou and Souphli have eight social distinctions in common (Appendix Table 10.3). As with the mortuary treatment, these two sites are most similar to each other in the overall sample (Table 10.6; n=0.615). In contrast, only Kephala and Tharrounia are similar in Region 2 (Table 10.5; 0.692). These two sites are also most similar to each other in the overall sample (Table 10.2). Kitsos Cave only has one social feature in common with these two sites. Kitsos Cave is not similar to any other sites, and eludes regional classification according to social distinctions. The Region 3 sites also show little similarity in social distinctions. Even the Franchthi examples are not similar. In sum, most sites are not very similar to sites within the same region.

Phase	Site	Most Similar	Same Region	Same Phase
EN	EN Prosymna	Souphli, Zarkou (0.385)	-	+/-
	EN Souphli	Zarkou (0.615)	+	-
	EN-MN Franchthi	Franchthi, Tharrounia (0.154)	+/-	-
MN	MN Franchthi	Souphli, Zarkou, Kephala, Tharrounia	-	-
LN	LN 1 Zarkou	Souphli (0.615)	+	-
	LN 2 Tharrounia	Prosymna, Souphli, Zarkou, Diros, Kitsos, Kephala, Tharrounia (0.077)	-/-/-/-/-/+/+	-/-/+/+/+/-/-
	LN Diros	Prosymna, Souphli, Zarkou, Kitsos, Kephala, Tharrounia (0.077)	+/-/-/-/-/-	-/+/+/+/-/-
	LN Kitsos	Prosymna, Souphli, Zarkou, Diros, Kephala, Tharrounia (0.077)	+/-/-/-/-/-	-/+/+/+/-/-
FN	FN Franchthi	Tharrounia (0.231)	-	+
	FN Kephala	Tharrounia (0.692)	+	+
	FN Tharrounia	Kephala (0.692)	+	+

Table 10.2. Summary of the spatial and temporal similarity in social distinctions during the Neolithic.

There are two reasons for these results. First, is the interpretability of the remains. Only at six of the sites was a wide range of social distinctions detectable. This factor has affected the comparability of the samples. Second, regional similarities are most strong in Regions 1 and 2. These regions also have high degrees of similarity in normative mortuary treatment. A regional character is less strongly represented by the social distinctions in these societies. Overall, this analysis only isolated a regional pattern of social distinctions between societies dating to the EN and LN phases.

3. Summary

In sum, during the Neolithic, social distinctions are defined by regional uniqueness during the beginning of the Neolithic, and by temporal uniqueness during the FN phase (Table 10.1-2). The major distinction is that sites in the North are most similar spatially, regardless of time, while sites in the South show more similarity within the common chronological phase. Even though mortuary symbolism may be quite similar at many of these sites, social distinctions appear to be quite site specific. Therefore, it is highly likely that supra-local recognition of social statuses did not exist during the Neolithic (cf. Peebles 1971). Status recognition was probably only recognized at a local level by a common social group.

C. Temporal and Regional Variation in Society

In this analysis, four sites (i.e., 50%) were adequately documented to allow an analysis of the dimensions of variation in the Neolithic social systems. Therefore, only an indication of the structural and organizational differences in Region 1 (Souphli Magoula, Plateia Magoula Zarkou) and Region 2 (Tharrounia, Kephala) are discussed below. The analysis is based upon the data given in Table 10.3 below.

Site	R.L.*	H	H_{max}	D_t	RD_t	S_t	H/H_{max}	"SC"**
Souphli (EN)	3	0.80307	2.53429	1.731223	0.68312	18.5	0.31688	68.31%
Zarkou (LN 1)	4	0.54708	4.0834	3.536345	0.86603	126.5	0.13397	86.60%
Kephala (FN)	4	1.35259	4.08537	2.732774	0.66892	17.14	0.33108	66.89%
Tharrounia (FN)	5	1.63397	3.1209	1.486928	0.47644	63	0.52356	47.64%

* Number of structurally different rank levels.
** Degree of social efficiency.

Table 10.3. The dimensions of variation in the Neolithic social systems.

1. Rank Grading

During the Neolithic there is an increase in rank differentiation from the EN-LN 1 phases, and during the FN phase. In Thessaly, there is a dramatic difference in rank grading between Souphli (n=18.5) and Zarkou (n=126.5) (Fig. 10.1). Zarkou has four hierarchical grades of ranking compared to the three at Souphli. During the Final Neolithic in Region 2 there are also acute differences between the rank grading systems (Fig. 10.1). Tharrounia proves to have a greater degree of rank differentiation (n=63) than does Kephala (n=17.14). In this case, Kephala has only four hierarchical grades of ranking, while Tharrounia has five. What is curious about this pattern of rank grading is how Zarkou and Tharrounia appear as two "spikes" in the distribution. In other words, the relationship as seen expressed in Fig. 10.1 is not linear (either positively or negatively).

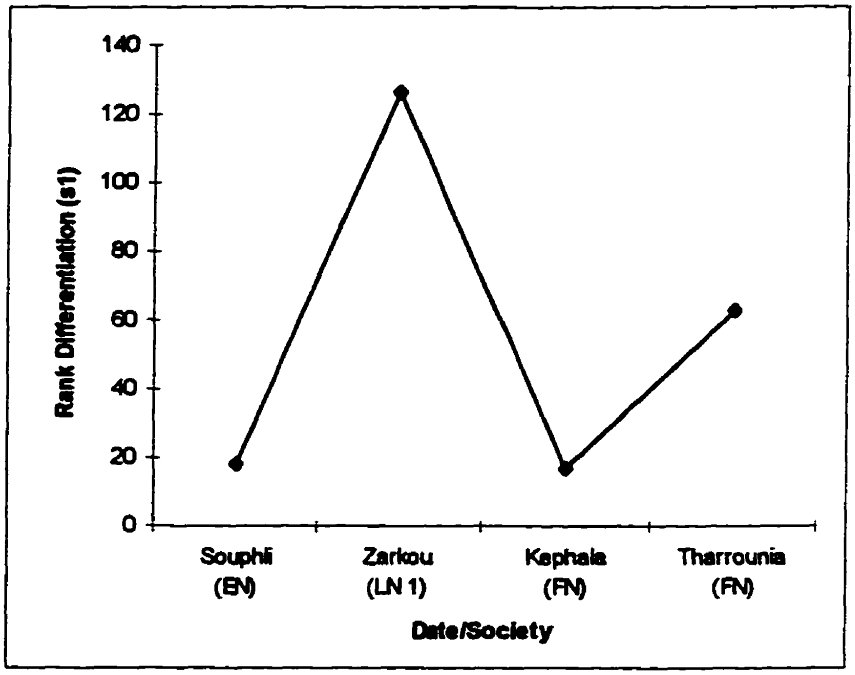


Figure 10.1. Rank differentiation represented by the Neolithic social systems.

The differences in rank grading appear to be affected by the demographic distribution of the population amongst the rank levels (Table 10.4). Demographically, there is little similarity between these two highly differentiated societies. Although they have the same number of rank levels, the distribution of the population throughout the rank grades is dissimilar. At Tharrounia, most of the population is in the middle rank level (Rank 3), while at Zarkou the majority of the population is in the second and fourth ranks. Therefore, we should not expect these two societies to have similar social structural and organization properties.

Rank Level	Kephala		Tharrounia		Zarkou		Souphli	
	Frequency	% of Population	Frequency	% of Population	Frequency	% of Population	Frequency	% of Population
1	7	8.97%	1	3.70%	5	7.46%	2	11.11%
2	23	29.49%	1	3.70%	24	35.82%	4	22.22%
3	47	60.26%	16	59.26%	13	19.40%	3	16.67%
4	1	1.28%	6	22.22%	25	37.31%	9	50.00%
5			3	11.11%				
Total	78	100.00%	27	100.00%	67	100.00%	18	100.00%

Table 10.4. *Population distribution among the rank levels in the Greek Neolithic societies.*

Kephala and Souphli, on the other hand, are more similar. Both societies have very similar frequencies of the population in the lowest ranks (Kephala, 61.54%; Souphli 66.67%). Perhaps this is why rank grading at Kephala and Souphli is so similar. In contrast to the other two societies, it is more plausible that Kephala and Souphli will be more similar structurally and organizationally.

There is regional similarity in demographic distribution at these cemeteries. In Figure 10.2 below, two clear patterns can be observed. First, the population of the third (or middle) rank level appears to be the most important factor. The population distribution in the ranks above and below this are random. Second, societies in the same region have similar frequencies of individuals in the middle rank. In Region 1 societies, the majority of the population is in the third rank level. At Zarkou, the third rank holds

19.40% of the population, while at Souphli the third rank level has 16.67% of the population. In stark contrast to this pattern, Kephala and Tharrounia have a very high portion of the population in the middle rank. The frequency of individuals in the third rank is almost identical at each site (Kephala 60.26%; Tharrounia 59.26%). The reason why these two societies have very different rank scores is probably because of their structure. These societies have almost exactly the opposite structure: most of the population at Kephala is in the upper ranks, while Tharrounia has most of its population in the lower ranks. Therefore, even though the societies are similar in their demographic distributions, there is little reason to suppose that they would be structurally or organizationally similar.

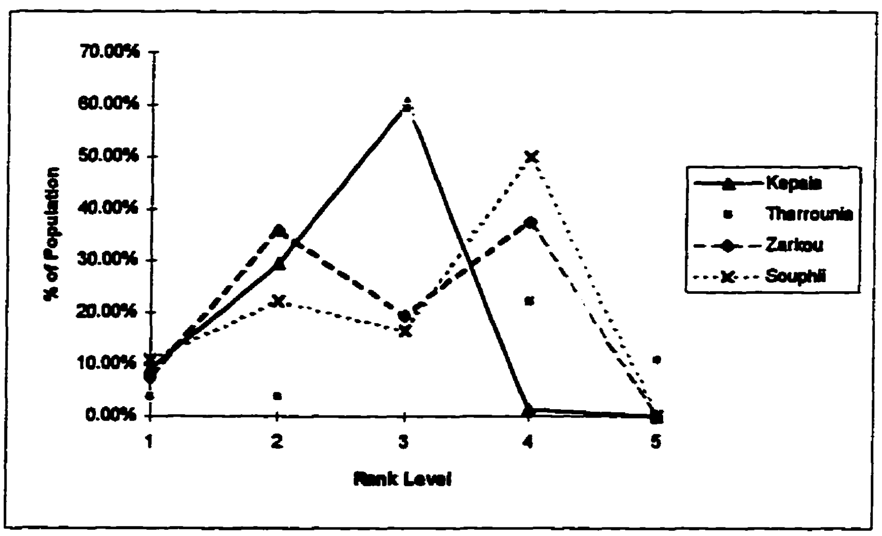


Figure 10.2. Distribution of the Neolithic mortuary population by rank level.

Generally, the more pyramid-like the population distribution is throughout the rank levels, the more difficult it is for members of the society to gain access to all the statuses in the society. Overall, this pattern of rank differentiation suggests that access to statuses would be most difficult to obtain at Zarkou, and maybe Tharrounia. This should be reflected in the structural complexity and organizational constraints exhibited by these social systems.

2. Structural Complexity

In these societies, the structural complexity does not mirror the degree of rank grading (Fig. 10.3). The data suggests that there was a change in structural complexity during the Late Neolithic. During this time, Zarkou shows a high degree of structural complexity. This is probably related to the low frequency of individuals in the premier rank in the society. The EN and FN societies are less structurally complex than Zarkou. Souphli and Tharrounia have few members in the upper rank level. Kephala, in comparison, has a moderate number of people in the premier rank. This is perhaps the reason why is has a moderate level of structural complexity. In general, structural complexity is not a product of the raw number of rank levels. Overall, there is a general tendency towards increased structural complexity to the LN phase, and decline after this.

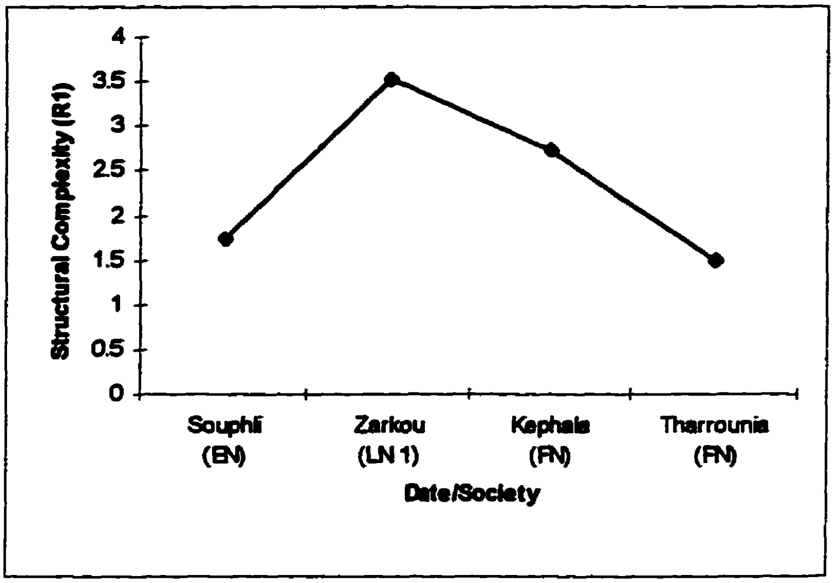


Figure 10.3. Structural complexity represented by the Neolithic social systems.

3. Relative Organization

The relative organization of these societies closely reflects the structural complexity (Fig. 10.4). This is a logical result, as the range of constraints placed upon social behavior should reflect the range of contexts where this behavior can be played out (cf. Chapter 2). It appears that Zarkou was demographically organized at the maximum level possible for a society with four rank levels. As would be expected, the societies with four rank levels are similarly organized. Again, there is a pattern of growth from the EN-FN, and one of decline during the FN phase.

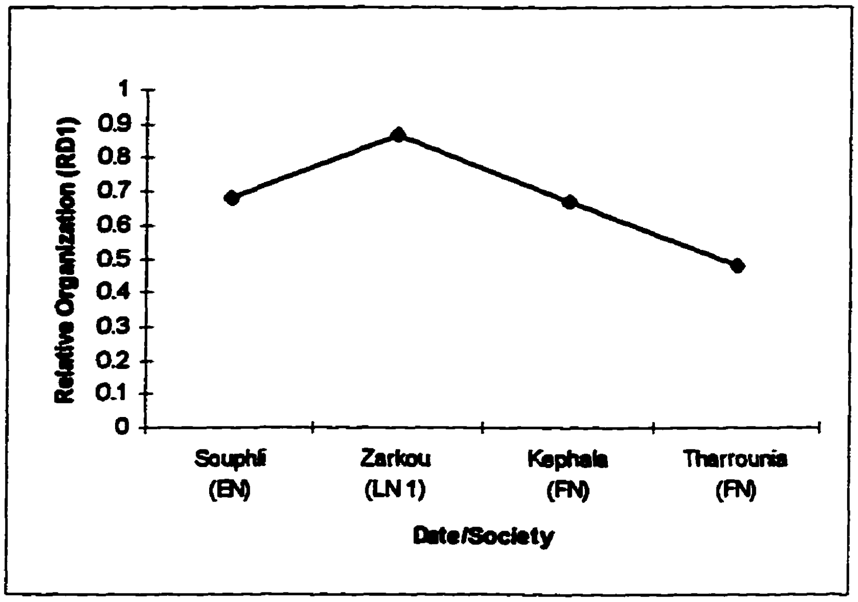


Figure 10.4. Relative organization represented by the Neolithic social systems.

4. Entropy and Social Efficiency

In this analysis, the entropy of the population distribution among the rank levels of each Neolithic society is assessed. This measure of entropy reveals the amount of randomness or disorder created by a society that has a certain structure (D_1), organization (RD_1), and system of rank grading (S_1). By determining the entropy created by a social system, it is possible to describe the inverse relationship, or the efficiency of the social system. Therefore, the entropy created by a social system should be inversely proportional to the structural complexity, relative organization, and degree of rank differentiation. This is mainly because these three elements of human society are created to prevent, delay, or combat entropy. Therefore, in the scale employed in this analysis, the greater the entropy produced by the society the higher the score.

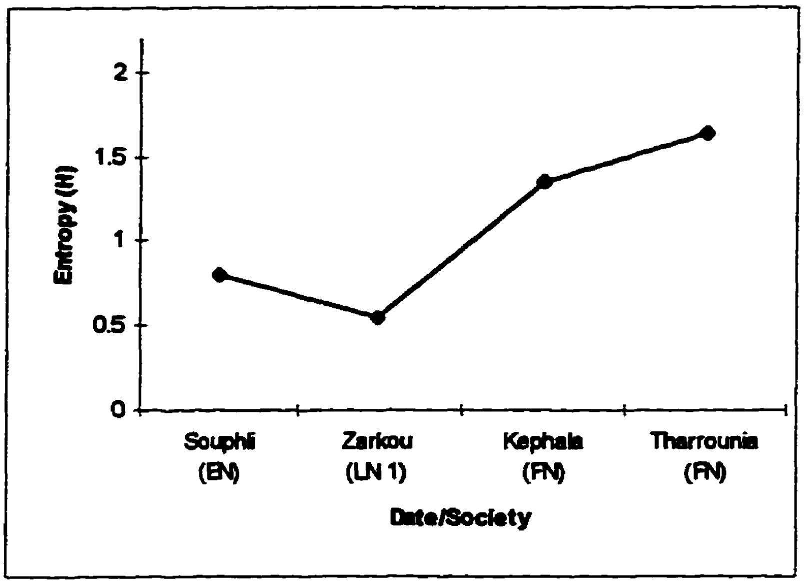


Figure 10.5. Entropy represented by the Neolithic social systems.

The Greek Final Neolithic social systems exhibit this anticipated inverse relationship (Fig. 10.5). Zarkou is the most efficient society, exhibiting the least entropy. This is reflected in the structural complexity and relative organization of the society.

The societies at Kephala and Tharrounia are more similar in social efficiency. This suggests that these societies may have been organized to face similar stresses, and responded in much the same way to them. Although these stresses may have been no different for the society at Souphli and Zarkou, the structural and organization response was much different. Zarkou shows an increased structural and organizational complexity, although the degree of rank grading is much higher than the other societies. These changes resulted in a more efficient social system, more able to cope with uncertainty and stress. The society at Souphli show a greater ability to face uncertainty and stress than the FN societies. Overall, societies become less efficient as the end of the period approaches.

5. A Cross-Cultural Comparison of Neolithic Social Efficiency

The purpose of this section is to describe the social systems of the Neolithic in a broader cultural context. By comparing the Neolithic societies with historically or ethnographically documented social systems, conclusions can be made more confidently. Below, the Neolithic sample is compared to two groups of societies from very different geographical and temporal locations. The first group includes societies from the Middle Woodland (A.D. 180) and Late Woodland (A.D. 650-790) cultures of the American Midwest (Tainter 1978). These societies have generally been understood as complex hunter-gathers (Tainter 1978). However, a shift to maize agriculture occurred late in the Late Woodland period (represented by the Schild site). The second group includes the Polynesian chiefdom societies of Kaloko and Anaeohoomalu on Hawaii (Tainter and Cordy 1977).[1] Kaloko was the chiefdom's centre of administration during this time, while Anaeohoomalu was a production centre (Tainter and Cordy 1977). In the following analysis, I will compare the rank grading and social efficiency of the Neolithic social systems to these previously documented studies.

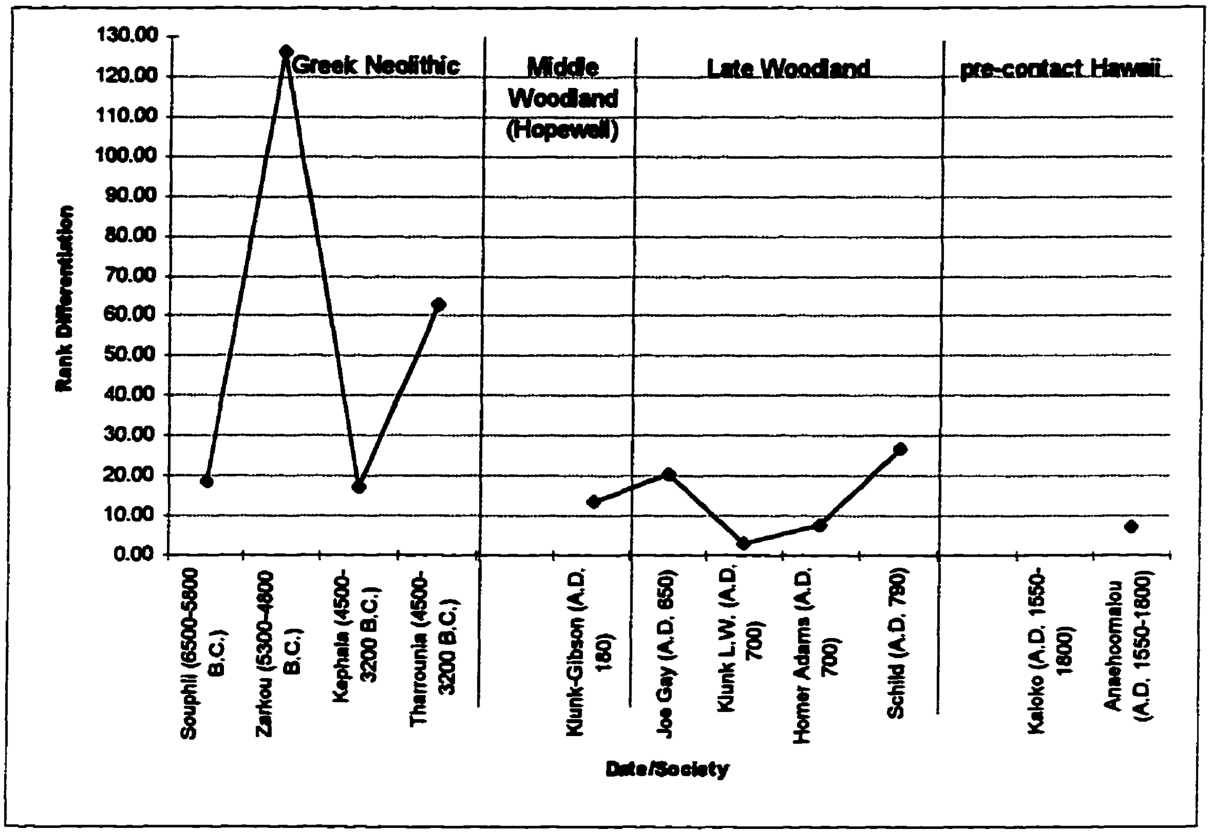


Figure 10.6. Cross-cultural comparison of the rank differentiation of social systems from the Neolithic, Middle Woodland, Late Woodland, and pre-contact Hawaii.

a) Rank Differentiation

I take into account rank differentiation in this analysis because it does not match the trends of structural or organizational complexity, or the pattern of social efficiency. Previous studies have shown that these social dimensions generally, although not entirely, mirror each other (Tainter 1977a, 1977b, 1978; Tainter and Cordy 1977). By placing the Neolithic societies in a broader context of interpretation, it is hoped that the reason for this discrepancy can be delineated.

Overall, Greek Neolithic societies show a dichotomous distribution: rank differentiation is either very high or very low. The societies at LN Zarkou and FN

Tharrounia have scores much higher than the Late Woodland society at Schild. Schild had an efficient society based on a small trade network and maize agriculture (cf. Tainter 1977a). Tainter (1977a, 1977b) has suggested that Schild begins a trend towards highly organized and highly differentiated social systems which characterize the later Mississippian period. Zarkou and Tharrounia also shows a trend towards increased rank differentiation. It appears that Zarkou and Tharrounia were undergoing, or already underwent, changes to the basic fabric of their respective societies. This pattern also suggests that access to statuses at Zarkou and Tharrounia was becoming, or was, restricted. However, this was more exaggerated at Zarkou. This does not suggest social specialization in either of these societies, but does imply that the rules of membership and exclusion were more strictly defined.

The EN society at Souphli and the FN society at Kephala show similarities with the Late Woodland Joe Gay site. This Late Woodland society is moderately differentiated (in the context of this analysis). This suggests that access to status in these societies was less difficult than at Zarkou, Tharrounia, or Schild.

b) Social Efficiency

In the Greek Neolithic there is a general trend towards more efficient social systems until the Late Neolithic period. During the last phase of the Neolithic, social efficiency drops to a level lower than that encountered during the EN phase. This suggests a decline in society as one approaches the subsequent Bronze Age.

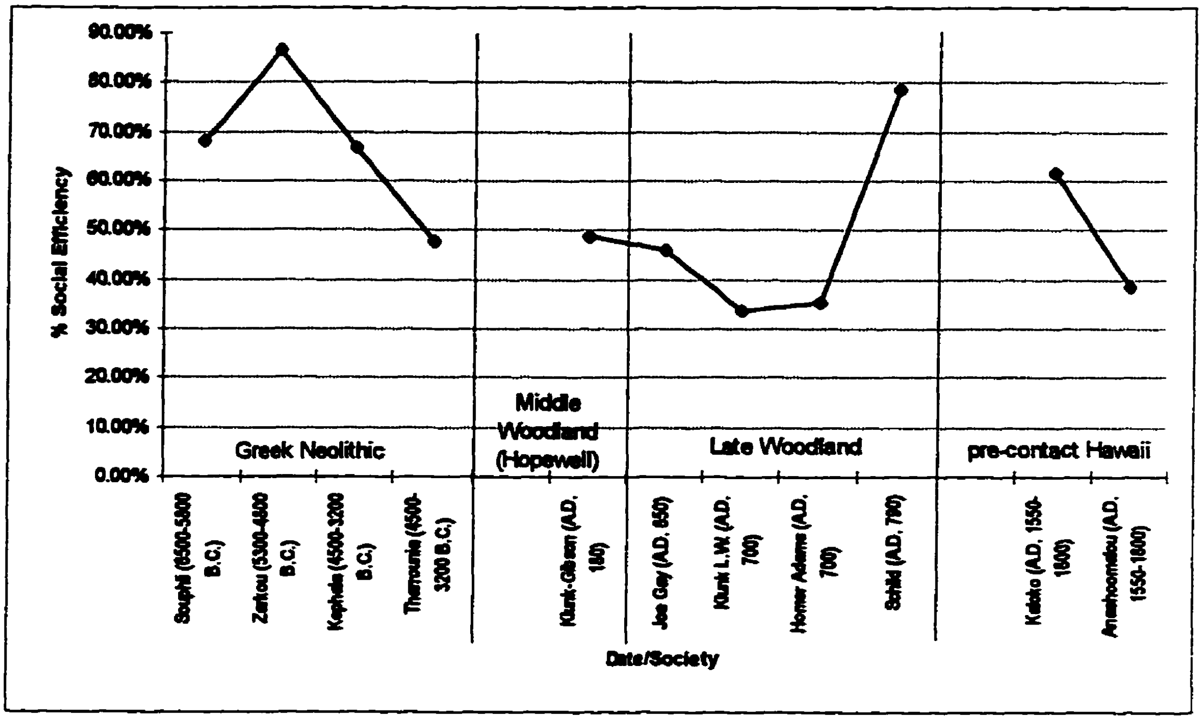


Figure 10.7. Cross-cultural comparison of the efficiency of social systems from the Neolithic, Middle Woodland, Late Woodland, and pre-contact Hawaii.

The Neolithic societies hold three common features with the comparative sample. First, Zarkou proves to be a highly efficient society, comparable to the Schild site. Both these societies were self-sufficient agricultural villages with relatively large populations. In contrast, Souphli and Kephala were smaller settlements, and belonged to a more intensified system of trade and exchange. Tharrounia has a very low score, equal to the more complex of the Middle and Late Woodland hunter-gather groups. This suggests that Tharrounian society was more unstable than the other Neolithic societies. This lack of stability may have been tied to the subsistence-economy of the group (as it is with hunter-gathers). It may also be that the society at Tharrounia is part of a larger social system, and this analysis is only detecting a part of a larger social group. Alone, this group may appear unstable, but when taken in context of the larger social group to which it belongs, this instability may not exist.

c) Hypothesis Building

This comparison with other cultural systems allows two testable hypotheses to be suggested for the Greek Neolithic. First, the structure and organization of the Neolithic societies should reflect the integrative capacity of the social system. More highly organized and efficient systems, with greater rank differentiation, would be capable of 1) regulating task performance; 2) allocating personnel to task units; 3) directing energy flows; and 4) coping with competition and stress (Tainter 1977b:347). The sociological data for the Greek Neolithic suggests that the societies at Kephala and Zarkou may have had these abilities. In contrast, Souphli and Tharrounia should not show these attributes as strongly. The settlement and subsistence data should mirror these observations.

Second, it is likely that similarities between the Neolithic, Late Woodland, and Polynesian societies lie in the way social and subsistence behaviors were regulated. In the Hawaiian chiefdoms and Late Woodlands cultures, authority was centralized, and extended beyond the realm of kinship, or kindred. As Tainter has observed, "centralized control would have resulted in greater regularity in subsistence-related behavior, and, correspondingly, in decreased uncertainty concerning energy flows" (Tainter 1977a:347). For the Neolithic societies of Zarkou and Kephala, we should also expect that authority was centralized. Conversely, the societies at Souphli and Tharrounia should not reflect highly differentiated nor specialized societies. Again, settlement and subsistence data should mirror the social data presented above.

IV. Concluding Remarks

A general feature of rank grading in the Neolithic is that the societies with fewer members in the upper rank level are more differentiated. For example, Zarkou and Tharrounia have greater degrees of rank differentiation than do the other Neolithic societies. I believe this disparity is a product of the hierarchical distribution of the population throughout the rank levels. That is, with a greater number of people in lower rank levels, there is an increase in rank levels and rank differentiation. This pattern conforms to Johnson's observations that the number of decision-making units at a given level of a decision hierarchy will give way to an increase in the number of hierarchical levels as a society becomes more specialized (Johnson 1978:87-88; 1982). However, it remains to be answered exactly how specialized Neolithic societies like Zarkou and Kephala were, if at all.

Surprisingly, the structural and organization complexity of the Neolithic social systems do not mirror the pattern of rank grading. Instead, Tharrounia shows a higher degree of rank differentiation, but low levels of efficiency, and structural and organizational complexity. Tharrounia generally represents a case of social decline. Kephala and Souphli, in contrast, have low degrees of rank differentiation, but are highly organized and structured. The society at Zarkou is, perhaps, where we should expect it. It is more structurally complex or organized than the other societies.

Also interesting is the general lack of temporal similarity in either mortuary patterns or social distinctions, particularly between Northern and Southern Greece. This suggests that there was little substantive movement of social groups until the end of the

Neolithic. However, social groups often change their mortuary patterns, as well as their structure and organization when moving to a new territory.[2] Studying broad patterns of change does not allow specific developments to be outlined.

I believe that a consideration of settlement and subsistence patterns can shed further light on the temporal and regional analysis described in this chapter. In the following chapter I will integrate the observations made in this chapter with previous qualitative research into settlement pattern, subsistence, and trade and exchange in the Greek Neolithic. By incorporating qualitative and quantitative observations, I hope to elucidate a more rounded understanding of Greek Neolithic society.

Appendix Table 10.1. Regional similarity in normative mortuary treatment.

Region 1		*LN 1 Zarkou*	*EN Souphli*			
	LN 1 Zarkou		19			
	EN Souphli	0.95				

Region 2		*FN Tharrounia*	*FN Kephala*	*LN Kitsos*		
	FN Tharrounia		15	9		
	FN Kephala	0.75		7		
	LN Kitsos	0.45	0.35			

Region 3		*EN-MN Franchthi*	*MN Franchthi*	*FN Franchthi*	*LN Diros*	*EN Prosymna*
	EN-MN Franchthi		15	15	5	11
	MN Franchthi	0.75		15	4	11
	FN Franchthi	0.75	0.75		6	12
	LN Diros	0.25	0.2	0.3		4
	EN Prosymna	0.55	0.55	0.6	0.2	

Appendix Table 10.2. Temporal similarity in normative mortuary treatment.

Early Neolithic		*EN Souphli*	*EN Prosymna*	*EN-MN Franchthi*	
	EN Souphli		12	9	
	EN Prosymna	0.6		11	
	EN-MN Franchthi	0.45	0.55		

Early Neolithic-Middle Neolithic		*EN-MN Franchthi*	*MN Franchthi*		
	EN-MN Franchthi		15		
	MN Franchthi	0.75			

Late Neolithic		*LN Kitsos*	*LN Diros*	*LN 2 Tharrounia*	*LN 1 Zarkou*
	LN Kitsos		12	9	11
	LN Diros	0.6		4	5
	LN 2 Tharrounia	0.45	0.3		11
	LN 1 Zarkou	0.55	0.25	0.55	

Final Neolithic		*FN Tharrounia*	*FN Kephala*	*FN Franchthi*	
	FN Tharrounia		15	7	
	FN Kephala	0.75		8	
	FN Franchthi	0.35	0.4		

Appendix Table 10.3. Regional similarity in social distinctions during the Neolithic.

Region 1		*LN 1 Zarkou*	*EN Souphli*
	LN 1 Zarkou		8
	EN Souphli	0.615	

Region 2		*FN Tharrounia*	*FN Kephala*	*LN Kitsos*
	FN Tharrounia		9	1
	FN Kephala	0.692		1
	LN Kitsos	0.077	0.077	

Region 3		*EN-MN Franchthi*	*MN Franchthi*	*FN Franchthi*	*LN Diros*	*EN Prosymna*
	EN-MN Franchthi		1	2	0	1
	MN Franchthi	0.77		2	0	0
	FN Franchthi	0.154	0.154		0	1
	LN Diros	0	0	0		1
	EN Prosymna	0.077	0	0.077	0.077	

Appendix Table 10.4. Temporal similarity in social distinctions during the Neolithic.

Early Neolithic		*EN Souphli*	*EN Prosymna*	*EN-MN Franchthi*
	EN Souphli		5	2
	EN Prosymna	0.385		1
	EN-MN Franchthi	0.154	0.077	

Early Neolithic-Middle Neolithic		*EN-MN Franchthi*	*MN Franchthi*
	EN-MN Franchthi		1
	MN Franchthi	0.077	

Late Neolithic		*LN Kitsos*	*LN Diros*	*LN 2 Tharrounia*	*LN 1 Zarkou*
	LN Kitsos		1	1	1
	LN Diros	0.77		1	1
	LN 2 Tharrounia	0.77	0.77		1
	LN 1 Zarkou	0.77	0.77	0.77	

Final Neolithic		*FN Tharrounia*	*FN Kephala*	*FN Franchthi*
	FN Tharrounia		9	3
	FN Kephala	0.692		1
	FN Franchthi	0.231	0.77	

Notes to Chapter 10

[1] The data used in this analysis is derived from the study of the Late and Middle Woodland societies by Tainter (1977a), and from the study of pre-contact Hawaii chiefdom societies analyzed by Tainter and Cordy (1977). The table below summarizes this data.

Site	Phase	H	Hmax	D1	RD1	Hmax/H	*SC
Joe Gay	Late Woodland	0.4911	2.6064	2.1153	0.8116	0.1884	81.16%
Koster	Late Woodland	0.9818	2.0696	1.0878	0.5256	0.4744	52.56%
Klunk L.W.	Late Woodland	1.3486	1.7529	0.4042	0.2306	0.7694	23.06%
Homer Adams	Late Woodland	1.3825	1.8105	0.4279	0.2364	0.7636	23.64%
Schild	Late Woodland	0.6672	2.9702	2.3029	0.7754	0.2246	77.54%

Table 10.2. Dimensions of variation in the Late Woodland social systems.

[2] A case like this has been documented for the ancestors of the Maori of southern New Zealand and the Moriori of the Chatham Islands (Anderson and Bloyd 1996). Anderson and Boyd suggest that changes in the structure and organization of these societies were brought about by contact with a new subsistence reality (1996:153). They argue, that even though the societies appear to become less "complex" as compared to their island of origin, they did so only as an adaptive strategy.

CHAPTER 11

CONCLUSIONS

I. Introduction

The objective of this thesis was twofold: first, to present a new methodology for the analysis of mortuary remains, and second, to submit social data for the Greek Neolithic period. This type of data is most useful for studying the social development of archaeological societies. However, mortuary evidence is not the only data that can be used to study social development. For this study I have chosen to focus upon mortuary data because: 1) it has not been investigated using empirical methods of analysis; 2) it has not been used to investigate social inequality or heterogeneity during the Greek Neolithic; and 3) the variation in mortuary practices and social distinctions have never been compared against the qualitative observations of earlier research (e.g., settlement pattern, trade and exchange systems, subsistence economy, and so on). In this final chapter, I present the results of considering the third reason for undertaking a study of mortuary data.

II. Modeling Inequality, Heterogeneity and Social Development

At the crux of defining social inequality and heterogeneity is determining what characteristics represent social disparities in archaeological societies. Previous studies have suggested that social inequality exists when differences are not based upon age, sex, or occupational statuses (Peebles and Kus 1971; Tainter 1977a; O'Shea 1984). That is, vertical social distinctions provide the best signposts of social inequality. However, the presence of vertical social differences, such as ranking, prestige statuses, and ritual office, do not necessarily define a "complex" society.

The distinction between a complex and non-complex society is often not an easy one to make. Numerous scholars have argued for social complexity based upon the complexity of the material remains of a culture (e.g., papers in Price and Feinman 1995; Meyer, Dawson, and Hanna 1995). However, complex material culture does not necessarily mean the *society* was complex (Meiklejohn and Brinch-Peterson 1995). For example, sophisticated procurement or manufacturing strategies, differential access to resources and goods, and large public structures are characteristic of the Hopi and Anasazi of the American Southwest, the New Guina highlanders, and the Nuer and Dinka of East Africa. None of these peoples had a complex social structure or organization - complicated, yes, but not complex. The only qualitative key we have to define social complexity is *specialization*. In the past, specialization has been qualitatively defined by investigations of mortuary remains (e.g., Tainter 1977a, 1977b, 1978; O'Shea 1984) and settlement remains (e.g., Hodder 1982; Halstead 1984).

I have followed others in arguing that the main difference between grades of social specialization can be found in the structure and organization of status (Flannery 1972; Wright 1977; Peebles and Kus 1977; Johnson 1978, 1982). Two kinds of status specialization have been defined by Johnson (1978:87): "Horizontal specialization increases the number of decision-making units at a given level of a hierarchy, whereas vertical specialization increases the number of hierarchic arranged levels of such an organization." Fried (1967:110ff.) suggested that the hierarchic levels of a society can be roughly equated with rank grading. He submitted that ranked societies are differentiated from egalitarian ones partially by the development of specialized leadership, ascribed social status differences, and an increase in authority. However, a society that exhibits social ranking is not necessarily complex. The term "complexity" appears best confined to those societies that have rank and status *stratified* into classes. In most cases, complex societies should be confined to what have traditionally been known as "civilizations."

Societies that exhibit vertical social differences (e.g., ranking, hereditary ascription, ritual specialization, leadership specialization, etc.), are assumed to have control of certain political and social affairs (Fig. 10.1). This has been called "vertical control" by Johnson (1978:101). This distinction has blurred the line between what has traditionally been termed "tribes" or "segmentary societies" and "chiefdoms" (Service 1975). Societies that rely on vertical control occur in many different forms. Sahlins's (1963) distinction between "big-man" societies and "petty" chiefdoms of Melanesia and Polynesia serves as a good example. Both these societies have specialized leaders, ranking, and ritual specialists. The main social difference, Johnson observed (1978:101-102), is the lack of a systematic process of recruitment, training, and continuity in "big-man" societies. Therefore, even though both societies have ranking and are specialized, "big-man" societies do not have strict rules to ensure social continuity. Through the development of inheritance rules, the "petty" chiefdoms have this ability.

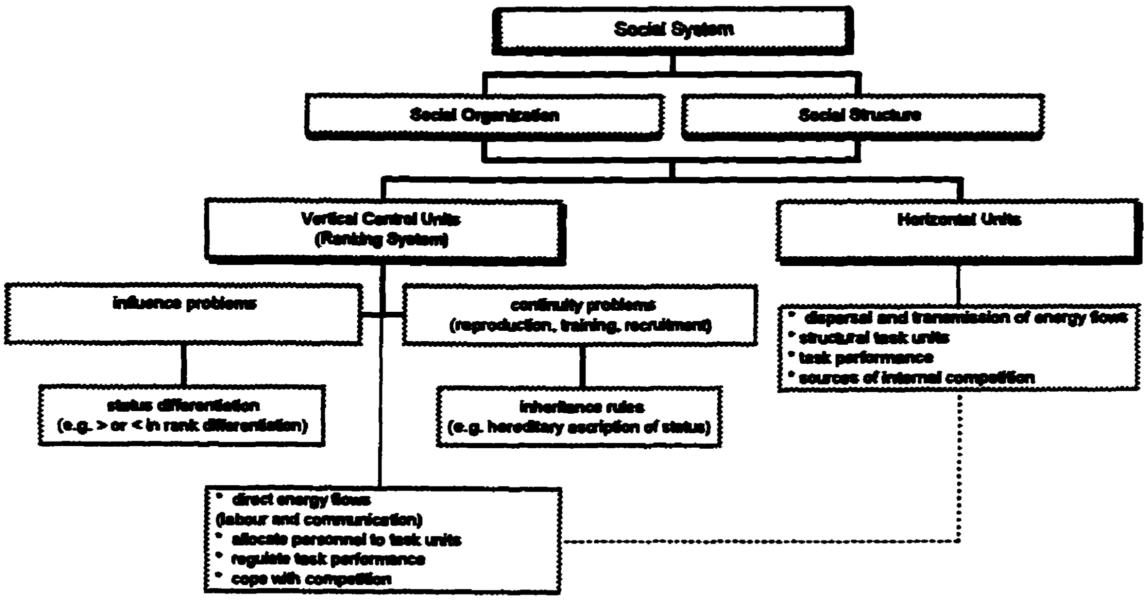


Figure 11.1. Model of the function of vertical and horizontal social units.

In both societies the vertical control units are concerned with influence and continuity of society. They just use different strategies to broach these issues. "Big man" societies do, however, have a system in place to encourage continuity. The competitive process involved in becoming a "big man" promotes continuity of leadership, but does not *ensure* it. Stricter inheritance rules in the "petty" chiefdoms are in place to ensure continuity of leadership, but, of course, nothing is guaranteed. Vertical control units are also, then, preoccupied with making sure that authority and/or power is recognized, legitimized, and redundant in the community. Influence problems may lead to an increase or decrease in social differentiation, and vice versa (Johnson 1978:102). Generally, vertical control units and horizontal units have synergistic functions. Vertical control units function to regulate energy flows (labour and information) in a community, allocate personnel to task units, regulate task performance, and devise the means to cope with competition. Horizontal units, on the other hand, disperse and transmit energy flows in the community, they are the structural task units who perform the tasks, and they can often be the source of internal competition.

Although this model is simple, and crude in some respects, it can be related to specific behavioral problems. The present model's utility lay in its ability to suggest causes for social differences based upon the effect of selections for social efficiency - the logic being that certain social selections will allow the society to more efficiently cope with the basic problems of influence, continuity, training, and recruitment.

The main difficulty in defining a *complex society* lies in the scale that is used. Classification methods, such as the tribe-chiefdom-state model of social development, suggest that social complexity be defined by different types of social and economic organization, settlement pattern, religious organization, and settlement architecture and planning. I believe it is more important that we define degrees of social complexity. For these reasons, I have not relied upon the tribe-chiefdom-state model as a theoretical guide. These categories of social development have proven unwarranted and useless for measuring fine differences between societies. Therefore, I have advocated a method that describes social (or organizational) efficiency using ratio and interval scales. As I showed in the previous chapter, not only does this allow for temporal and spatial comparison of mortuary complexes from similar periods, but one can also compare societies of different eras and geographical regions. It also permits one to discuss two other issues. First, one can suggest how a society with a certain level of efficiency dealt with issues of influence, continuity, training, and recruitment. Second, it permits a discussion about the links between influence, continuity, and vertical social control.

In the sections that follow, I outline the evidence that suggests social inequality and regional social development during the Neolithic. In the first section I will describe the evidence for individual and group differentiation suggested by this analysis. In the following section, I will present a model suggested from the regional and temporal analysis of the four Neolithic societies in Chapter 10. In the final sections, I will propose a testable trajectory of social development for the Greek Neolithic period.

III. A Model of Greek Neolithic Social Development

The benefit of comparing the Neolithic to documented societies is that it allows the nature of Neolithic structural and organizational patterns to be more confidently inferred and described. However, in considering the present knowledge of the Greek Neolithic, it would be irresponsible to consider the all of the possible causal factors that may be responsible for social formation (see Chapter 3, Table 3.1). At this stage in research on the Greek Neolithic, it is only possible to examine how two processes may have acted in Neolithic social formation: subsistence and territorial stress.

A. The Early Neolithic

During the EN phase in northern Greece settlement density was low and sites were primarily located very close to the drainage systems of major rivers (Gallis 1989; van Andel and Runnels 1995). The ceramic evidence shows there were no stylistic boundaries in Thessaly during this time (Demoule and Perlès 1993). Following Cullen (1985), it may be suggested that the homogeneity in pottery styles is a function of close contact between social groups, perhaps involving an exchange of potters (women?) rather than pots. A ubiquitous pattern also characterizes the distribution of flaked tool and ornament assemblages in Northern Greece. This suggests that frequent contact between groups may have also been the mechanism for the exchange of tools, ornaments, and coping strategies.

In the Early Neolithic, the society at Souphli reflects the general characteristics of early agricultural societies (e.g., Renfrew 1972) experiencing sedentism and pressures to select for vertical specialization (Johnson 1978:100). The system of rank grading suggests that there was a strong regulation of task performance in the society. However, the demographics of the ranking system suggest that the regulation of social conduct and subsistence duties would be the responsibility of many people. The organizational and structural complexity suggests there was a regular subsistence-behavior in this society. This is supported by the present understanding of the EN tool-kit. This assemblage consists mostly of flaked blades used for plant processing and scraping. There is no evidence, either technological (high frequencies of arrowheads, etc.), pathological (wounds, etc.), or geographic (dense settlement pattern), to suggest aggravated competition for resources in Thessaly during the EN.

The mortuary complex more strongly exhibits group and not individual differentiation. Limited personal differentiation would have acted to signify those in authority whenever meetings, or trade and exchange took place between groups. The absence of the hereditary ascription of status suggests there were no regularized provisions for status continuity at Souphli. The present evidence does not permit comment on training strategies, but recruitment of new members may have been gained through inter-group exchange in the territory. Leadership seems to be specialized rather than generalized. It is more likely that the decision-making structure in this society consisted of a village "big-man," rather than, for example, involving a group of elders. The social group at Souphli was most likely semi-nomadic, subsisting by combining animal husbandry strategies with hunting, the gathering of wild plants, and trading for a limited range of goods. It is plausible that social groups in Thessaly operated on a system where territorial changes were made seasonally, as suggested by the palaeo-erosion evidence. However, certain territories may also have often been shared by some groups.

B. The Late Neolithic

In the LN phase, there is a dramatic increase in site density from the earlier EN phase (Gallis 1989; van Andel and Runnels 1995). Ceramic and stone tool production data also reveal certain important changes in production strategies. During this time there is the first indication of regional pottery styles. Various ceramic types fall within restricted regional boundaries, and little material was circulated (Demoule and Perlès 1993:384). There was also an increase in the production and procurement of specialty items, such as stone seals and vases, and stone and shell ornaments. The absence of these types of artifacts in mortuary contexts suggests that they were used to signify social group solidarity, ownership, and access to certain rights and resources, rather than specific individual differentiation and ownership. Furthermore, there is a dramatic increase in the production of arrowheads during the LN 1. By the later LN 2, the arrowheads were facilitated with a lateral notch, perhaps so they could be used on the ends of long spears. It has been proposed that trade in prestige goods (like spondylus shells, marble and metal objects) would have helped stimulate social differentiation during the LN phase (Demoule and Perlès 1993:396). These rare and valued goods could be acquired through a competitive process of securing external alliances. This would promote social differentiation, which by the LN, is reflected in village organization.

By the beginning of the LN phase, there is a dramatic change in the status differentiation in Thessaly. Society at Zarkou is socially very differentiated, and is highly structured and organized. This social system theoretically would have been able to facilitate the regulation of task performance (subsistence, product manufacture, etc.), allocation of specific tasks to individuals, and the efficient direction of energy flows (including communication and labour expenditures) in the population. The sociological and subsistence evidence from Zarkou suggests that this society was self-sufficient. It was probably able to cope with moderate fluctuations in subsistence stress and competition. This society was certainly more sedentary than EN societies. The adoption of intensified agricultural production would have allowed a more consistent environment to establish a social hierarchy.

The degree of social differentiation at Zarkou suggests that there was specialized leadership, ascribed social status differences, and the development of a more sophisticated authoritative hierarchy compared to the earlier EN phase. Only at Zarkou was an increase in rank differentiation reflected in the structural and organizational complexity. Other authors have suggested that similar social situations may have been a response to territorial and subsistence stresses (cf. Carniero 1970:736; Burling 1974:18). This may also be the case at Zarkou.

As the population in the basin increased dramatically during the LN phase, more groups would have been coming into contact with each other. Group solidarity and identification would have become more important, and disputes over who was to be involved in the decision-making process might have ensued. As Johnson (1978:103) has noted, often there is an increase in status differentiation and regulation of status inheritance as the number of groups a society comes in contact with increases.

Several factors suggest that the society at Zarkou may have been formed by problems of influence or authority recognition. A response to outside pressure on resources, skills, and people would have been to increase the internal status differentiation (Johnson 1978:102). As a result, the access to these resources, skills, and people would have become more restricted. The structural and organizational complexity and the social efficiency at Zarkou suggest that this increase in status differentiation was vertical. In other words, the number of rank levels in the society were increased, not the number of horizontal decision-making units. Therefore, the structural and organizational complexity of the society increased dramatically. This allowed a more efficient social framework in which internal and external stresses could be dealt with.

In the broader context of the Late Neolithic phase, the site of Zarkou can be viewed as a precursor to later Thessalian sites like Dimini and Sesklo. These two sites are prime examples of organizational responses to territorial competition. The implementation of coping strategies, regulation of task performance, and the allocation of task units would have been necessary to facilitate the settlement architecture and planning of these sites.[1] The organization of Dimini and Sesklo suggests that inter-group competition had reached its peak in eastern Thessaly by the LN 2 phase. After the LN, less prosperous small-scale settlements characterize this region (cf. Demoule and Perlès 1993; cf. Fowler 1997: Chapter 7).

C. The Final Neolithic

The Final Neolithic societies are characterized by regional social uniqueness. Kephala is a highly structured and organized society. This is moderately reflected in what remains of the settlement architecture and planning (Coleman 1977). Substantial differences in social status are more strongly suggested by Kephala's place in a wide-ranging system of trade and exchange (Perlès 1992). A more highly structured and differentiated society would be expected if a significant proportion of the economy was based upon the production, trade, and exchange of valued (e.g., metals, marble, etc.) and some non-valued goods (e.g., flint, chert, etc.). Overall, Kephalian social structure and organization appears to be tied more to the production of specialized items, rather than based upon subsistence stresses.

The evidence for ascribed social status differences at Kephala suggests that there was a systematic process in place to ensure status continuity. The level of rank grading, although low, suggests specialized leadership. There is, then, evidence that Kephalian society was efficiently run and largely unaffected, if at all, by influence problems. The structural and organizational complexity at Kephala indicates that the society would have been able to facilitate the regulation of task performance (subsistence, product manufacture, etc.), allocation of specific tasks to individuals, and the efficient direction of energy flows (including communication and labour expenditures) in the population. This also would have allowed the society to effectively cope with competition and change. Overall, Kephala displays many the social attributes of a complex kin-based society (Service 1975:74). As Sahlins (1958) has shown, these societies do not have to exhibit social stratification.

Tharrounia is a less structured, more flexible society than the other Neolithic societies. Studies of the settlement, subsistence, and transhumance patterns for Euboea (Sampson 1992), indicate that the Tharrounia settlement was home to semi-nomadic pastoralists and farmers. Sampson's (1992) study suggests that only a limited amount of area could be used for grazing and stock raising on Euboea. Therefore, it is likely that pastoralist groups on Euboea moved seasonally to and from the mountains and the lowlands. However, there is little evidence to suggest that there were disputes in the territorial exploitation these resources (Sampson 1992). Rather, it has been argued that Tharrounia was a seasonal settlement from the spring to autumn (Sampson 1992:101). The topographic peculiarities of the area make access difficult during the winter. If, indeed, pastoralism was the main subsistence behavior on Euboea, we should expect status inequality at Tharrounia to be based upon different social and subsistence duties and obligations, rather than upon differential rights or access to local resources (i.e., different valued or prestige goods).

On Euboea during the FN phase, severe soil aggradation (Runnels and van Andel 1995) and decreases in site density (Sampson 1992; Sackett *et. al* 1966) have been documented. A degraded environment would have placed pressure on the resources, skills, and the populations of the island. We can presume that this necessitated a change in coping strategies, and it is likely that simply leaving the island was one such strategy (as shown by the decrease in site density). Another response to outside pressure on resources, skills and people would have been to increase the internal status differentiation (Johnson 1978:102). However, unlike Zarkou in Thessaly during the LN phase, at Tharrounia this increase in status differentiation appears to have been horizontal. In other words, the number of decision-making units in certain rank levels increased, not the number of rank levels. This is reflected in the low frequencies of individuals in the upper rank levels. Therefore, there was a decrease in the structural and organizational complexity, and the efficiency with which the society could combat the randomness or uncertainty it faced.

Tharrounian society had the structural and organizational attributes necessary to facilitate a centralized control of subsistence behavior. In pastoralist societies, a low amount of energy and time is needed to upkeep flocks, particularly if they are used only for primary products (as is the case at Tharrounia; cf. Kotjabopoulou and Trantalidou 1993:399). However, care of the animals often involves a great deal of time because flocks have be moved constantly. This may be linked to a curious aspect of Tharrounian society, where women are more socially differentiated than men. In fact, there are no discernible status differences between males, other than age status. This suggests that women more consistently occupied the settlement and were the bearers of social rank and status differences. This is most significantly shown by the place of women in the higher rank levels. These different occupational roles were probably made on the basis of sex and age. It is likely, then, that status in this society was linked to more than just specialized stockbreeding. Nevertheless, society at Tharrounia appears to have been structured and organized around coping with subsistence stresses.

IV. Regional Trends in Northern and Southern Greece during the Neolithic

In general, the model I have proposed for social development in the Neolithic is based upon regional differences in status, society, environmental factors, subsistence behaviors, and material culture. I have so far presented evidence that suggests social development occurred differently in northern and southern Greece. Below I will outline this evidence as it pertains to each general region.

A. Society in Northern Greece

In the north at the beginning of the Early Neolithic, settled life is transitory, being repeated at different locations for short durations (cf. Cherry *et al.* 1988). Subsistence was based upon diversified agricultural production, hunting, and gathering. Life under these conditions must have been unpredictable and stressful. Differences in social status at Souphli reflect this. Often, under times of stress, group identity is maintained by internal differentiation (Champion *et al.* 1984:110). This character is shown by the social differentiation at Souphli.

This picture of the Early Neolithic contrasts sharply with the later Late Neolithic phase. During this time, sites expanded and shifted from the hills to the alluvial plains (Demoule et al. 1988; Gallis 1989; Halstead 1984). By the second half of the LN, settlements are large, protected, and permanent. I have suggested above that this pattern is linked to subsistence and territorial stresses caused by population increases, shifts in subsistence behaviors, and competition for local resources and skills. In essence, the distribution of settlements and trade and exchange networks in Late Neolithic Thessaly mirror what has elsewhere been defined as "social territories" (Clarke 1968; Clark 1975). After the Late Neolithic, site density decreases and people move into the larger settlements. Demoule and Perlès (1993:403) have suggested this change was due to some social crises, as Thessaly became weaker and weaker in the exchange network by the Final Neolithic phase.

B. Society in Southern Greece

A different pattern characterizes the south. There is no significant increase in site density from the Early into Late Neolithic. Localism in material culture defines these phases. By the beginning of the Final Neolithic, populations increase, settlements become more dispersed, and subsistence strategies change to combine seasonal pastoralism and horticulture. However, much of the material culture is of inferior quality compared to previous phases. For example, with pottery, decorations are simple and fabrics are coarse. Most of southern Greece appears to have been neglected in the new trade network, which prospers only in south-central Greece and the islands. Demoule and Perlès (1993:403) have suggested that this situation may have brought about social changes, particularly in the way social ranking was symbolized.

These observations generally corroborate the Final Neolithic social data. Kephala shows characteristics of a prosperous settlement involved in the exchange of rare and valued goods. On Euboea, Tharrounia is a society struggling amidst deleterious changes in the environment and available resources.[2] In general, by the end of the Final Neolithic, society is declining in structural and organizational complexity, sites are becoming abandoned, and more people are inhabiting the nearby islands (cf. Cherry et al. 1988).

V. Concluding Remarks

It appears that a host of factors had a role in the formation and collapse of societies during the Neolithic. The dissolution of societies in the Final Neolithic is followed by the Early Bronze Age, which initially is very similar to the later centuries of the Final Neolithic. However, by the EB 2 phase, there is a dramatic social reformation, based upon an intensification and diversification in agricultural production; the redistribution of products; specialization in craft production; dispersed, hierarchical settlement pattern; complex trade and exchange networks; and the social differentiation of individuals and groups. Within this very broad outline, the Neolithic social data generally fits within the expectations of earlier qualitative research.

The results of this analysis suggest two possibilities for further research. The first possibility is that the analyses of the Early Bronze Age data must be reconsidered. Pullen (1985:368-379) did not positively detect rank differentiation, or occupational or craft specialization in the EBA. This analysis has shown that rank differentiation existed by the EN phase. Further, there is a growing body evidence for occupational and craft specialization by the LN phase (e.g., Miller 1995). As well, as was detected in the EBA material, corporate group membership is a common feature of Neolithic society. However, it must be noted that this study and Pullen's study used very different scales, methods, data, and theoretical perspectives. Therefore, we are not comparing like with like at this point. The second possibility is that there are flaws in the methodology used in this thesis. For example, it is not known how changes in technology will affect some of the indices used in this analysis. Therefore, some of these results may be exaggerated. However, this will not be known until the method can be tested against controlled cases of historical data. Only then can the Early Bronze Age material be evaluated using this method, and compared to the Neolithic data. Further, this method was designed to address only mortuary remains. I have relied on the independent analyses of other Neolithic data. This study would benefit from an analysis of the settlement data for comparative purposes. This is surely in the works, as more and more knowledge is being gained from large-scale settlement survey being done throughout Greece.

My approach to the study of society has been rather different from previous work. I have demonstrated that that settlement location, scale, and economy are not variables that allow the structural and organizational aspects of a prehistoric society to be modeled adequately. Rather, I have argued that the social rank and statuses held by members of a community provide better structural referents to the composition of a social system. By monitoring these elements of a social structure, I believe the social development of a single society, societies inhabiting a common region, and social changes over time, was sensitively described and compared. However, I must forward a caution. This method does not allow a single society to be simply plugged into the model. That is, a researcher cannot take a single society, submit it to this analysis, and determine the degree of social complexity. This approach is only beneficial when a group of societies is monitored over time and space. As is apparent in Fig. 10.5, small samples, such as the Hawaiian data, are not very useful for comparing broad patterns of social development. Only larger samples can be used to compare patterns of social variation and change over time.

In summary, the concepts and qualitative methods developed in this thesis have proven useful in an archaeological study of mortuary differentiation, social distinctions, and social development. The general concepts underlying this study have successfully guided the investigation to isolate the variables that acted to produce mortuary and social differentiation. The quantitative methods employed in this thesis have revealed patterns of social differentiation and development that in many ways parallel the qualitative suggestions of earlier research. Using these methods, I have presented evidence to suggest that rank and status differentiation existed in Greek prehistory far earlier than previously expected. This study has provided evidence that Greek Neolithic societies formed as an organizational response to subsistence and territorial stress. Further, I have suggested that societies in Greece be modeled from a regional perspective, geared towards mapping out temporal and spatial trajectories of social development. In conclusion, the Greek Neolithic can no longer be characterized as a time when various semi-nomadic and sedentary groups lived during a period of social equality. Instead, it appears the economic and social inequality that characterizes all subsequent periods have their origin in the Neolithic.

Notes to Chapter 11

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[1] Both Dimini and Sesklo are similar in plan: a large circuit wall or ditch surrounded the settlement. The houses inside this periphery were organized around a large central house structure known as a *megaron*.

[2] Please see Stickle *et al.* (1966) and Sampson (198?) for site density on Euboea, and van Andel, Zangger, and Demitrack (1990) for evidence of deliterious valley aggradation and coastal accretion patterns during the Neolithic.

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