AGRICULTURAL PRACTICES AND COUNTRYSIDE IN CLASSICAL GREECE

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ABSTRACT

AGRICULTURAL PRACTICES AND COUNTRYSIDE IN CLASSICAL GREECE

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The subject of this study is the rural settlements in Classical Greece. There is no doubt that there were various factors determined the ancient settlement patterns in Greek countryside. Geographical conditions, socio-economic and political structures can be regarded as major significant factors behind the settlement practices of ancient societies. In this study the relationships between agricultural system and rural settlements of Classical Greece will be examined.

Keywords: Agricultural System, Rural Settlements, Classical Greece, Surveys

ÖZ

KLASİK YUNAN'DA TARIMSAL UYGULAMALAR VE KIRSAL ALAN

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Bu çalışmanın konusu Klasik Yunan'da kırsal yerleşimlerdir. Şüphesiz antik Yunan'da kırsal yerleşim örüntülerini etkileyen çeşitli faktörler vardı. Coğrafi şartlar, sosyo-ekonomik ve politik yapı antik toplumların yerleşim pratiklerini belirleyen temel faktörler olarak değerlendirilebilir. Bu çalışmada Klasik Yunan'daki tarım sistemi ve kırsal yerleşimler arasındaki ilişkiler incelenecektir.

Anahtar Kelimeler: Tarım Sistemi, Kırsal Yerleşimler, Klasik Yunan, Yüzey Araştırmaları

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CHAPTER 1

INTRODUCTION

The aim of this study is to examine the rural settlement patterns of Classical Greece. Certainly there were various factors that determined the ancient settlement patterns in Greek countryside. Geographical conditions, socio-economic and political structures can be regarded as major significant factors behind the habitation practices of ancient societies. However, my specific intension is here to analyze relationships between the agricultural system and the rural settlements of Greece during the Classical Period. The hypothesis of this study is that agricultural intensification in Greece during the Classical Period increased the level of settlement dispersion and consequently the number of individual farmsteads in the countryside.

The innovation of agriculture has been accepted as the most important revolutionary shift in human history. In ancient times, supporting higher number of population had become possible with agriculture that offered adequate and various sort of food supply. Transition from nomadic to settled agricultural community affected and also changed almost every structure of the ancient societies including their economic, political and settlement systems of organization and the interactions with their environment (Redman 1999:90).

The next chapter of this study includes an examination of agricultural system of Ancient Greece. Although there were some considerable differences

between the agricultural practices and applications of the Classical and the earlier periods of Greece, there were also some similarities in agricultural systems of these periods and it is possible to detect some continuations and impacts of earlier phases especially Archaic over the Classical Period. Thus in Chapter 2, I will try to express the agricultural system of Classical Greece in relation to the earlier or pre-Classical periods. In the first section of Chapter 2, I will describe the geography of Greece including its climate and natural sources. This is important because the agricultural possibilities or constraints of ancient societies were highly determined by their natural environment. In the following section of the chapter, I will examine the agricultural production of ancient Greece in terms of three basic agricultural products, which are cereals, olive, and vine. The third and fourth sections of Chapter 2 explore issues of basic production unit as household, land ownership and exploitation strategies of agricultural resources.

In the beginning of the 5th century B.C. the characteristic features of the Greek world were the increase in population and decrease in capability of resources of physical environment. Population increase started from the Archaic Period and after that more and more cultivation had become an inevitable necessity to meet the subsistence needs of the increasing population. Before the 5th century B.C. the general trend in agriculture was to cultivate the favorable lands, especially fertile plains. However, during the 5th and 4th centuries B.C. Greeks started to expand their cultivated fields to the hillsides and they ploughed all the potential arable lands (Dale and Carter 1955:99-100). Thus, remarkable increase of population could be suggested as a factor that determined the agricultural intensification in the Classical Period. Carter stated that in the late 8th century B.C. as a result of the *synoecism* process, which means growing central locations for the needs of dispersed rural populations, poleis started to appear in the Greek world. At earlier times Greek poleis were small and chiefly self-sufficient communities.

However, during the Classical Period they became much more depended on their countryside in order to satisfy the needs of non-agricultural class such as craftsmen and merchants. So, together with population increase, demands coming from the non-agricultural sector of the society entailed intensive agriculture in Classical Greece (Carter 1983:19). In Chapter 3, I will investigate the intensification processes in Greek agriculture of the Classical Period. I suggest four indicators of agricultural intensification as irrigation, terracing, manuring, and tower structures. I will examine each of these indicators in the separate sections of Chapter 3 and try to illustrate them with archaeological evidences.

The most important contribution of archaeology for the regional studies was its focusing on the rural rather than the monumental structures of the city. This was the result of beginning to apply field survey as a new method of exploration in Ancient Greek societies. By using this new method collecting the archaeological data in a systematic and scientific way has become possible. Another advantage of archaeological survey compared with excavation was that it was a non-destructive method (Rich and Wallace-Hadrill 1991:x). Since the 1940's archaeological field surveys have been important tools for studying human prehistory and history. Different from the traditional excavations, archaeological surveys have aimed to explore the settlement and population histories of not only the cities but also the entire landscapes including the rural part of the regions (Bintliff, Kuna and Venclova 2000:1). Archaeological survey is accepted as fundamental aspect of contemporary archaeological research. However, until the 1970's archaeological survey has not been highly regarded. Before that time surveys were designed to find "typical" sites to document the distribution of particular site types or to locate "productive" sites. Today, survey is highly accepted as a main data gathering method for archaeological research projects (Sullivan 2000:600-601).

The classical farmstead has been one of the basic units of analysis for regional studies in Greek archaeology. Although the earlier studies have shown that the defining and locating the farmstead in ancient sources were very difficult, archaeologists have been trying to find and define the main features and forms of farmsteads and other rural settlements by designing intensive survey projects in the Aegean region (Pettegrew 2001:189). Almost every part in ancient Greek world, including Attica, Boeotia, the Crimea, the Argolid, Ionia, the Peloponnese and the Aegean islands, farmsteads were a significant feature of the classical landscape. Isolated farmstead type of residence in Classical Antiquity has reflected more intensive production and the protection needs of private property. However, the rise of intensive agricultural production in isolated farms had not meant that farmers abandoned living in nucleated settlements. Many rural people in the Aegean region had continued to live in small hamlets and villages (Hanson 1995:53-59). In Chapter 4 I will examine four of archaeological survey projects (Southern Argolid, Southern Attica, Boeotia, and Oropia), which were conducted in the mainland Greece, in terms of their approaches and interpretations on the Classical Farmsteads and their relations to the agricultural system. The reason behind my choosing these survey projects as case studies is that all of them have conducted in close proximity to each other; so, the effects of natural conditions to both ancient agricultural and settlement system could be supposed as stable. Additionally, it is certain that my intention in this study is not to make great generalizations for agricultural and settlement systems of Classical Greece. It is much clear that such an attempt requires comparing more studies and more regional projects should be conducted in all over the Aegean.

CHAPTER 2

AGRICULTURAL SYSTEM OF CLASSICAL GREECE

Agriculture led three main changes in the system of ancient organization. These changes had affected the communities and their interactions to the environment. First, sedentary lifestyle caused population increase and higher number of people tended to gather into denser settlements. After this aggregation, communities looked for more arable lands with sufficient rainfall and relocated themselves to such areas. Intensification of production led another aggregation to the lands in which irrigation was possible. Second, as a result of sedentary lifestyle and the intensification of production, social structure of communities began to change. Permanent settlements had yielded to increasing substantial houses, storage buildings and production implements. Improvements in the storage capacity caused the material accumulation beyond the subsistence needs of people. As a result of managing and controlling over this surplus production, some members of the societies had acquired privileged positions and some social hierarchies had been established. Third, production and therefore social and political organization of ancient communities had changed as a result of agriculture. Productive strategies of early agricultural communities were highly flexible that meant they chose a mixed strategy depending on the variety of resources so they could be more resistive in the time of failures of one or more production. However, specialization had occurred in the communities that their production was greater in size. Most ancient societies had combined these flexibility and specialization strategies through hierarchical

organization of specialized lower and diverse higher order productive units (Redman 1999:90-91).

Examining the agricultural system of Classical Greece I will separate the subject into three. First I will try to describe the agricultural production and then explain basic production unit (*oikos*) and finally the issue of land ownership. But before that, I will look at the geography of Greece since the geographical conditions for a region including their advantages and limitations are the main factors that determine agricultural system.

2.1 Geography of Greece

People's perception of natural environment in antiquity was much different than ours. Living in a highly egocentric and technological world, modern man always try to reshape the natural environment in accordance with his desire rather than adapting to it. However, in antiquity the relationship between man and his natural environment was very dissimilar compared to that of the modern world. The life, economy and culture of the classical world were highly shaped by the natural environment (Jeskins 1998:1).

The climate of Greece is typically Mediterranean characterized by mild winters and dry summers. Rainfall regime is highly irregular and torrential in winters. The summer is very hot so that drought is unavoidable in some regions. However, climate of higher elevations is quite Alpine characterized by rough and snowy winters and warm summers. Melting snow during the spring provide adequate amount of water to the soil but it dries-out in the periods of hot summer (Isager and Skydsgaard 1995:10). There is a close relationship between agricultural productivity and climate. Paleo-environmental studies about ancient Greece have proposed that there was no bigger climatic alteration in the region and they suggested that twenty-five

hundred years ago the climate of Greece was not so different from that of today (Morris and Powell 2006:13). Osborne (1987:29) stated that:

> *Extravagant claims have sometimes been made that the climate at various particular periods of antiquity was dramatically different from that of the present day, so different that it was difficult for men to survive at all. Recent work, however, has made it clear that the broad pattern of the Greek climate has remained the same for the past three or four millennia at least. There have certainly been some minor short-lived changes and local peculiarities and some of these have indeed affected agriculture, but broadly speaking the climate posed the same problems for the ancient farmer as it does for his modern Greek counterparts.*

Small coastal plains and hillsides were the characteristic features that affected the agricultural system and the settlement patterns of ancient Greece. While the plains were with a higher degree of efficiency, scrubs and brush covered the hillsides. There were pine forests in some mountainous areas but some of them were naked and unfavourable for any plant (Morris and Powell 2006:13-15). The coastal lowlands were very attractive for ancient people thus most of the human settlements had been estabished in such areas. Mild winters and hot summers are the characteristics of the coastal lowlands of the Greece. This type of climate is very advantageus for some annual crops like wheat and for some perennial crops like olive. The high mountains break of the relief. In winter they are snow bound hovewer cool and well watered in summer. The high pastures of the mountains are very suitable for livestock in hot summers so transhumance, twice yearly movement between lowland and mountain, is an inevitable output of this natural constaints (Halstead 1987:77).

Latitude, elevation, winds and rainfall had constituted the local conditions, which affected the natural vegetation resources of the ancient Mediterranean. Because, much proportions of the region are mountainous or rugged, plant

colonization and range of vegetation are very restricted (Jeskins 1998:15). There are significant local variations and natural limitations in the Aegean region. There is a considerable relation between elevation and rainfall regime. Orographical impact is very important in evaluating climatic fluctuations in Greece. The orographic and hydrographic maps of Greece (Fig.1 and Fig.2) clearly demonstrate this relationship. We can see from these maps that the western part of Greece has maximum quantity of rainfall. The reason is that the winter winds bring humid air and while raising over the mountains it discharge its water. The maps also show that the most arid regions in Greece are Attica, the Islands and the Saronic Gulf but the cost of Asia Minor and Cyclades are less arid (Isager and Skydsgaad 1995:10-11).

Together with climate distribution of soil was an important determinant of agricultural practices in ancient Greece. The rocky characteristics of the Greece highly affected the possibilities of land exploitation in agriculture. Different types of rocks weathered in different manner so produced various qualities of soils so that some of them were fertile and some of them were subjected to erosion. Climate has been accepted as the main reason of the soil erosion in the ancient Greece but there were also human activities related with agriculture that accelerated the soil erosion in some cases (Osborne 1987:21). Agriculture is based on the exploitation of soil and land so that natural vegetation can be negatively affected in the areas where there is a trend of dense cultivation. Isager and Skydsgaad (1995:12) stated that soil erosion in Greece was highly attached to the devastation of natural vegetation especially of the forests. According to Osborne (1987:21) ancient farmers had to clear their land from the natural plants to make cultivation on it and they over-grazed their sheep and goats thus they might have increased the degree of erosion and deforestation. Such geo-morphological changes resulted from both the natural and human impact in Greece, which can be founded from the Bronze Age to the latter periods. But he stated that there has been no specific proof for increasing removal of the natural vegetation on

soil of Greek countryside. It is true that agricultural exploitation of the land in ancient times led directly to loss of ground soil, but the building of terraces and field walls would have also maintained the landscape.

2.2 Agricultural Production

The ancient Greek world directly reflected the characteristics of the Mediterranean region. The soils, climate, and latitudes were the most important factors that determined the both possibilities and limitations of the ancient Greek agriculture. Together with largely limestone based soils and the Mediterranean type of climate that characterized by wet winters and hot summers some terrains such as well-watered valleys and inland plateaus made the cultivation of cereals, vine, and olive possible. Different from fertile valleys and plateaus most of the uplands of Greece were not much suitable for cultivation but at least they offered forests and hill pasture. Some types of plants were growing better in some regions; but generally ancient Greek farmers applied mixed-cultivation in order to get wider range of foodstuff so to be self-sufficient. In ancient Greece fragmented landholdings were favoured in order to reduce the risks in agricultural production resulted from the possible disasters in a single region. Indeed ancient Greeks preferred to make cultivation in various territories that showed local variations in weather. So that they could save themselves to get good yields from some regions if the crops in other regions exposed to unexpected failures (Burford 1993:109-119).

Hesiod's *Works and Days* and Xenophon's *Economics* are the two important ancient sources of Greek agriculture. Xenophon, in his *Economics* described several activities of ancient Greek farmers in the light of the dialog between Ischomachus and Socrates. Similarly in Hesiod's *Works and Days* we can find various explanations about the ancient agricultural life and processes of

the Greek society. However, the approaches of Hesiod and Xenophon to agriculture were completely opposite. Xenophon's view of agriculture was optimistic but that of Hesiod's was rather pessimistic. This situation was the reflection that they belonged to very different social classes. Being a noble, Xenophon had not directly attended to the agriculture; however Hesiod was a poor farmer and he was at the core of the agricultural system (Isager and Skydsgaad 1995:9).

Cereals, vine, and oil were the basic agricultural products in ancient Greece like in the entire Mediterranean region. Cereals were used to satisfy the staple needs of nourishment while production of vine and oil had a rather important place in ancient Greek economy (Forbes 1965:113). Ancient Greeks used the term *sitos* for all cereals (Isager and Skydsgaad 1995:21). Barley and wheat were the main cereal crops in ancient Greek agriculture. However, barley was more extensively cultivated since it was better adapted to the Mediterranean type of climate and relatively poor soils. On the other hand wheat cultivation was harder because it was more sensitive to fluctuations of climate but the profit from the wheat cultivation in turn was much more than those of barley. Due to its flavour and cooking qualities ancient Greek farmers preferred wheat cultivation when the climatic and soil conditions were suitable. However, wheat never seemed to replace barley as the basic cereal crop because most of the farmers had wanted to take guaranteed themselves by cultivation of less risky crop that was more resistant to severe effects of the nature (Burford 1993:127).

The aim in vine cultivation was to produce high quality Greek wine that was very famous in the whole Mediterranean basin throughout the antiquity. Another important agricultural product was olive. Ancient Greeks were using olive as a foodstuff but its economic importance owed to the oil production.
One of the great successes of Greek agriculture was the domestication of wild plants so that it was possible to get more victual and plentiful foodstuff.

Degeneration of domesticated plants was the greater fear of the ancient farmers thus to keep the domesticated nature of the plants they had to well prepare the soil for cultivation. Removing superfluous stones from the field was the first step to struggle with the wild tendencies of plants. However some stones were intentionally left on the ground in order to protect the roots of plants against the extreme heat or cold (Burford 1993:121).

One of the basic problem of ancient Greek farmers resulted from the Mediterranean climate was that soils could not protect its humidity in the hot summers. In order to diminish the effects of such less humid character of soil, farmers had to apply some regular processes (Andrewes 1971:8).

Three-times plowing with additional digging was necessary as in spring, summer, and autumn. Some heavy lands needed to be drained by making trenches (Burford 1993:122). Hesiod told that sowing should be done in autumn (*Works and Days* II 383-404). And Xenophon (*Economics* XVI) advised that in spring the field should be ploughed before the sowing:

> *Ischomachus: Well then, supposing we begin to plough our land in winter?*
>
> *Socrates: It would not do. There would be too much mud.*
> *Ischomachus: Well then, what would you say to summer?*
>
> *Socrates: The soil will be too hard in summer for a plough and a pair of oxen to break up… I know precisely that for either object, whether to bring the weeds and quitch grass to the surface and to wither them by scorching heat, or to expose the earth itself to the sun's baking rays, there can be nothing better than to plough the soil up with a pair of oxen during mid-day in midsummer.*

In addition to plowing and drainage, manuring was essential to prepare the soil for a better cultivation. The term manure in Greek word was *kopros*. Burford (1993:123) stated that:

> *Kopros may mean several things; here it is presumably stable manure from the stalls of mules and plough oxen… The alternatives are stable manure, "green manure" (compost), or dung… was usually meant the weeds ploughed under spring to prevent them from robbing the fallow of moisture and nourishment, and from competing the next season with the growing crop.*

Rotation of crops and fallowing were other agricultural processes applied by ancient Greek farmers. Pulses such as bean, pea, and vetch add nitrogen to the soil when they grow. Ancient Greeks had known that fallowed soil with adequate amount of nitrogen was very suitable for cereal cultivation so that most of the time they preferred to rotate their crops within a three-field system to increase the amount of production. They distinguished that instead of two-field system in which half of the land was cultivated and another half of it left fallow, three-field system was more productive to left only a third of the land fallow and reserve the other two of them for mixed cultivation of cereal and pulses (Burford 1993:124).

2.3 Unit of Production

Early interpretations and approaches of Karl Bücher, Max Weber, M.I. Finley and Jules Toutain on the ancient Greek economy and society have played an important role on the later studies on this subject.

Bücher (1968:89) suggested that the economic development of early societies of central and Western Europe could be divided into three stages as independent domestic economy, town economy, and national economy. In the stage of independent domestic economy production and consumption

processes had been done in the same place. The aim of production in this stage was to satisfy the basic requirements of a small household (*oikos*) and there was no presence of exchange. In the stage of town economy there was custom production and direct exchange from the producer to the customer. Finally in the stage of national economy there was a large-scale production and a complex exchange process in circulation of goods that moved through many agents between the producer to the end user.

The importance of Bücher's work comes from his consideration the *oikos* as an ideal type. So, the ideal type of the household (*oikos*) economy could be applied to the whole studies of ancient economy. I will focus here only the first one of Bücher's stages of ancient economy. Because, he put the whole classical antiquity into the first stage. He named the first stage as independent domestic economy in which the only actor of production and consumption was the household (*oikos*) unit. Bücher (1968:89-90) stated that:

> *The stage of independent domestic economy is characterized by restriction the whole course of economic activity from production to consumption to the exclusive circle of the household (the family)….Production and consumption are here inseparably interdependent: they form a single uninterrupted and indistinguishable process.*

In his study of "The Agrarian Sociology of Ancient Civilizations" Max Weber applied sociological analysis to the ancient civilizations. He explored agricultural system, household economy, and social differentiations with their relationship to the land ownership. In analyzing the ancient Greek world, Weber divided it into two periods as pre-classical and classical.

According to Weber (1976:147-148), in the pre-classical Greece there was a primitive level of agricultural production. Although there were some practices

such as fallowing or manuring, the agricultural techniques were highly stabilized and the main feature of Greek agriculture depended on ploughing and cereal production. Besides, there was no clue to shift from subsistence agriculture to market production. Weber stated that in pre-classical Greece the patriarchal nuclear family was the basic type of living unit. However, nobles and kings lived in larger households apart from the masses in order to maintain the unity of inheritable land estates. As a result of the money economy the household transformed as an association for making profit.

Writing about ancient Greek society and economy Finley (1970:54-71) suggested that although there were some bigger alterations at the end of the Bronze Age, there were also considerable clues for continuation in the later periods of the Greek history. He stated that in the Bronze Age of Greece population was considerably increased and clustered in hillside villages with commanding view of the farmland. And there was a hierarchical stratification of society ruled by chieftains or kings. At the end of the Bronze Age the power of the ruling class was demolished and this led to some alterations in the general settlement pattern:

> *Some large centres were totally abandoned, for example Pylos and Gla. Others, such as Athens and Thebes, continued in occupation on a somewhat reduced scale. Still other areas eastern Attica, the coast of Euboea nearest the mainland, Asine of Cephallenia in the Ionian Sea now held larger population than before (Finley 1970:66).*

Techniques of agriculture, pottery and tool making were almost the same as before. In addition, worship and ritual activities reflected much continuity than change (Finley 1970:68). However, organization of Greek society started to change in the Dark Ages. The center of activity and power became *oikos* (household) which of power determined by wealth and skill. The role of tribes

or other large kinship groups had weakened in front of this new type of social unit (Finley 1970:84).

Lacey agreed with Finley that *oikos* was basic living unit in the Greek world. He stated that the ancestor's land and the family-cults in such a type of household unit were very important factors that provided a powerful attachment for individuals to live as a member of their *oikos*. There were also larger units of society, which were called the *genos* (clan), the *phratry*, the *phyle* (tribe) and the *deme*. Membership of an *oikos* was a precondition for membership of these larger groups. Belonging to these larger groups was important since it offered to individuals the full membership of the polis (Lacey 1968:16).

Everywhere in ancient Greece, the amount of agricultural yields varied significantly from year to year. In such an inconstant agricultural system Greek farmers had improved some adaptation mechanisms to protect themselves from possible deprivations or starvations (Gallant 1991:35).

The first step for Greek farmers was to decide sowing rate. This was important because at the end their choice determined the level of agricultural production. (Gallant 1991:46) Halstead stated that for the peasant farmers sowing rate and thus seed: yield ratio changed each year. Because they were determined by the factors like precipitation rate, soil types, life cycle and size of household, available labour force and so on (Halstead 1987:85). Gallant also pointed out that the two important determinants of the sowing rate are moisture and soil type (Gallant 1991:46-47).

Additionally farmers' decisions of sowing rate are also affected by their household's needs (Bland 1971:27). Figure 3 shows the relationship between

sowing rate, total output, and seed : yield ratio. The data of this table was collected from the eastern Mediterranean.

To estimate the yield of the agricultural land in ancient times required the data of total production, area under cultivation, and sowing rate for the major crops. However, most of the time these data cannot be gathered and inquiries about agricultural productivity of Ancient Greece cannot go beyond the simple speculations (Garnsey 1992:147). On the other hand scholars are not so pessimistic and they try to make valid productivity calculations by using ancient evidence.

Searching the productivity of Ancient Greece, Garnsey used the First Fruits payment inscription from Eleusis dated to 329/8 B.C. (*I.G.* II^2, 1672). He supposed that the payment was 1/1200 for wheat and 1/600 for barley as was the case in the late 5th century B.C. (*I.G.* I^3, 78) and suggested that a wheat farmer had to produce 25 *medimnoi* of wheat (1000 kg) and a barley farmer had to produce 12.5 *medimnoi* of barley (417.5 kg) to compensate the First Fruits payment. Garnsey stated that this figure only reflected one year's harvest and this was not enough to make a general assessment of the productivity in Classical Greece. He emphasized the importance of knowing the sown area and the sowing rate, and offered the following estimation figures for wheat and barley crops in a standard year of Classical Attica:

Proportion of Attica under grain = 17.5 %
Area under barley cultivation : Area under wheat cultivation = 4 : 1
Yield per hectare for wheat = 625kg / ha
Yield per hectare for barley = 770kg / ha
Total output for wheat = 5250000 kg
Total output for barley = 25872000 kg
Seed-yield : seed sown for wheat = 4.8 : 1

Seed-yield : seed sown for barley = 6 : 1 (Garnsey 1992:148).

Different from cereals, production of vines and olive trees required further care (Hanson 1992:161). The profit from cereal cultivation on a field of 20 *iugera* (5 ha) was equal with that from 5-*iugera* vineyard. Moreover, 1-*iugera* olive orchard was as profitable as 5-*iugera* vineyard; because, compared to vine cultivation olive farming required less labour force (White 1970:244). In the Classical Antiquity, a vineyard in 100 *iugera* in size had required 16-17 agricultural labourers. On the contrary, just a person was enough for an olive orchard of 18.5 *iugera* (White 1970:389-393).

The amount of cereal production was not enough especially in the Classical Period so that cereal import from abroad was a necessity (Forbes 1965:113). The Greeks were importing cereals from mainly three areas: South Italy (Sicily), south Russia, and Egypt (Andrewes 1971:10). The cereal import costs had been balanced with the export of wine and olive oil; in fact profit from the export of wine and olive oil sufficiently compensated the costs of cereal import (Forbes 1965:114).

2.4 Land Ownership

The most important factor of Bücher's stage of "independent domestic economy" was controlling the land, which also determined the position and relationships of the people in the rural system. Bücher (1968:90-91) stated that:

> *An autonomous economy of this kind is in the first place dependent upon the land under its control. At this stage the man who has direct possession of the soil can alone maintain economic independence. He who is not in this position can eke out his existence only by becoming the servant of the landowner, and, as such, bound to the soil.*

Membership of the community was directly related to the ownership of land. Weber distinguished two classes of landowners, the peasants and aristocrats who had large holdings in land and money. Characteristic feature of pre-classical Greece was the indebtedness of the peasants to the aristocracy (Weber 1976:171). Social contrast between aristocracy and peasantry were highly visible even there was a territorial distinction between these groups. Most fertile lands came into possession of the aristocracy. On the other hand unfertile mountain slopes were left to the peasants (Weber 1976:173).

The radicalism of the peasantry due to the loss of political rights, social degradation and economic insecurity was the most dangerous threat to the aristocracy. As a result of this radicalism the tyrannies were established and cities turned into semi-feudal fortresses that started to dominate the countryside. Thus, the aristocracy lost its privileges, all landowners became citizens and the cities became subjects to the countryside (Weber 1976:174).

Weber (1976:175) indicated that there were radical changes on land ownership in pre-Classical Period of Greece. Redistribution of the land and remission of debts were two important reforms applied by the radical leaders. The most famous one of those was Solon in Athens.

Finley (1973:139) suggested that the ability of ancient Greek cities to pay for their necessities depended especially on the amount of agricultural production from their rural area and the income from land ownership. He stated that agricultural techniques rested on accumulation of empirical knowledge and compared to earlier Bronze Age prehistory there was no noticeable change of them in the later history of the Greek world (Finley 1965:29-30). However, conflicts between the aristocrats and the peasants on land ownership started in the Archaic Age had considerably affected and

changed the social and economic structures not only in the Archaic Period, but also in the Classical Period.

Like Weber, Finley also stressed the increasing role of the aristocracy over the archaic society. By controlling the best fertile land, aristocracy increased its wealth and power by receiving a portion of the product or an amount of unpaid labour from the lower classes. Finley (1970:107) stated that the growing tension and conflicts between the aristocracy and the peasantry accelerated the establishment of tyrannies as Weber pointed out earlier.

According to Weber (1976:189-190) these radical reforms determined the form of land ownership in the Classical Period. During the Classical Period the only possible form of land ownership was hereditary lease. This limited land ownership was submitted only to the citizens. Absolute prohibition on the sale of an allotment, prohibition of property accumulation and limitation of property divide determined the basic characteristics of land ownership. Weber stated that these limitations had been imposed by hoplite states in order to maintain the economic bases of citizen arm. However, these limitations completely disappeared when the mercenaries started to provide defence requirements. He gave an example from the Attica: "*During the fifth century and after, land in Attica could be sold and mortgaged at will. Free disposition by testament existed if there were no legitimate sons, otherwise property could be left to anyone under guise of a legacy* (Weber 1976:191)".

Weber (1976:215-218) stated that in the Classical Period of Greece, land was divided into small parcels. The fertile plains used for horticulture and there was intensive agriculture on the hillsides. Small towns were established in the mountain valleys in order to bring the citizen farmers together. The long-term result of this settlement concentration was an agricultural system

with absentee ownership of large landholders who lack interested or not-directly participated in the agricultural production.

In his study of “The Economic Life of the Ancient World” Toutain (1968:9-10) described the agricultural system and land property in the Greek world from the 6th to 4th century B.C. He noted that the chief sources of agricultural wealth were cereals (wheat, barley and millet), vine, and olive.

Agreeing with Weber and Finley, Toutain (1968:37) stated that there was no corresponding change in the method or equipment of agriculture. Plowing, seeding, harvesting and threshing processes were almost the same compared to those that described in the poems of Homer and Hesiod. However, he mentioned that the Greeks had achieved to adapt their crops to the nature of the soil and climatic conditions.

By terracing, irrigation, manuring, and the rotation of cereals in addition to fallowing, Greeks had achieved to improve the quality of agricultural production. Toutain suggested that agricultural land in the Greek world was exploited either directly or indirectly. Direct land exploitation could be possible only with small rural families, who directly possessed, cultivated, and lived next to the agricultural land. According to Toutain at the beginning of the historical period in Greek world there appeared another system of land exploitation as a result of invasion and migration movements. The new comers reduced the old inhabitants as a serfdom status. Previous owners stayed on the land and continued to cultivate it; but now they had to share a large amount of their products to the new landlords. Finally in the last type of indirect exploitation agricultural lands were leased to tenant farmers by landowners for a proportion of the agricultural production or cash payment (Toutain 1968:37-42).

According to Tautain (1968:46) it is clear that in the 5th and 4th century B.C. in Greek world land was owned by individuals. And he disagreed with the thought that in the earlier times before the 5th century B.C. land was belonged to the whole family or *genos* rather than the head of the family. He rejected the collective land property since he thought that there was not an ancient text, which mentioned a piece of land belonged to the whole community.

However, Lacey (1968: 53-54) suggested that the members of each *genos* shared responsibility for the defence of their lands under the leadership of the head of the *genos* and they claimed right on the land property. So it need hardly to be doubted that in early times the ownership of land, or at least ownership of holdings of the best agricultural land was collective. Individual *oikoi* (plural form of *oikos*) composed all poleis. Since, the means of subsistence were forming an essential part of the *oikos*, the lands of an *oikos* were part of it. With the result that a man came to own his land (*kleros*) because he had established a claim as next of kin to the previous owner, either within a defined kinship-group or as the inheritor selected under a lawful will, or because he had purchased it, having the right to do so as a member of polis. The establishment of the *oikoi* as the units of polis was one of the important processes in the consolidation of independent poleis, in the long run, of any *genos*.

Efforts were made to attempt for ensuring the principle of remaining land lots equal, or fair. However, inequality was in the nature of things and was inevitable; one man might have better luck or might be a better farmer; one man might have more family members who were able to work on the land; one man might have heirs who were responsible landowners and another man's heirs might ruin the estate at once. It might cause great inequalities of fortune, in spite of the installation of safeguards preserving the principle that

to grant a land to a family in a new settlement was meant henceforth a part of the newly founded *oikos* was formed, as its fundamental means of support – as within the family its “ancestral portion” to be handed down in perpetuity. The vital link between the constituent of polis; *oikoi*, the citizen households, and their *kleros*, or land lot was assured by polis, the citizens were bestowed the rights of landownership and it was seen that neither the holders nor the others abused these rights. The polis allowed the enjoyment of private possession while retaining overall ownership; furthermore, by generation to the next the attachment between each household and the land was ensured to be maintained as far as possible. The preservation of the base unit of the polis, *oikos*, depended on inheritance’s assured transfer within the family, preferably from father to son. Inheritance was the best, simplest and most acceptable way to become a landowner, and it was the most satisfactory arrangement for a single surviving son inheriting the *oikos* and all the property when his father died, and for his son succeeding him in turn, forever (Burford 1993:29-35).

Managing the land available to the owner had three alternative means. He could either “work on his own account” as an *autourgos*, he could employ a bailiff to deal directly with the other labourers and see that its proper complement of crops and profits were produced by the estate, or he could become a landlord and let the land to a tenant, while rendering a regular rent who would assume all the responsibility of farming the land. There is a simple way to decide which is better to assume that wealth and status determined the landowner’s mode of managing his property. In order to employ his own labour on the land, generally the *autourgos* would have modest social background and be obliged by poverty. On the other hand, better-born landowners with more affluent automatically hired or purchased bailiffs along with other labourers to manage their personal attention to their estates as they chose. Great landowners, who rented their lands to tenants, could best

afford to remove themselves as far as possible from the concerns of stable, field, and vineyard (Burford 1993:167-168).

Like in all pre-industrial societies the most important farm of property was land in Greek society, within the all state, the right to own land was everywhere reserved to this state's citizens. It is certain that, the Greeks thought that property ought to remain in the family. A religious need to maintain a family shrine and to cherish the tombs of ancestors reinforced to leave land to one's own (Andrewes 1971: 97-106).

Gallant suggested a reconstruction of the average ancient Greek household life cycle and used this data to calculate the average farm size of Ancient Greece (Figure 4 and 5). The 24-year life cycle of the household was separated into eight three-year periods or *triennia*. In the first *triennium* when the eldest son married he brought his bride into his household thus a new *oikos* has become established (Fig.5, Phase 1). During the first *triennium* the head of the household was probably died, so we can assume virilocal residence for this stage. In the second *triennium* the household extended both vertically and horizontally (Fig.5, Phase 2). During the third *triennium* the younger son married and formed his own *oikos*. It might be possible that he and his bride continued to live in the natal household but they would have left the household in a short time. At this time the widowed mother was probably died. As a result of these two departures a nuclear household has been taken place and this situation would have continued for the next five *triennia* (Fig.5, Phase 3). During the seventh and eight *triennia* fragmentation would have started in the household. The father would have died and the daughter would have married. The widowed mother and two sons would have continued to live together until she would have died or the younger son would have married and left the household (Fig.5, Phase 4) (Gallant 1991:27-30).

In order to calculate the size of the average farm required to afford subsistence of a household over the life cycle in Ancient Greece, Gallant used the dietary estimates and output figures. One way to find the average size of Ancient Greek farms is to calculate the amount of land needed to produce the essential number of calories of the main crops for the levels of output per hectare. Table 1 shows dietary and land-holding requirements of the ancient Greek household over its life cycle. This data also demonstrated graphically in Figure 6 which shows that in the second, fifth, and sixth *triennia* land requirement of the household reached the highest point. From this figure we can conclude that the average amount of land needed for the household starts the point of 3.36 ha and it peaks to 4.12 ha during the sixth *triennium* before starting the household's dissolution. In addition to these figures, production and consumption parameters inferred from Mediterranean also demonstrates that 3-4 hectares cultivated land were required in order to provide the subsistence needs of a household unit (Gallant 1991:82).

CHAPTER 3

INDICATORS OF AGRICULTURAL INTENSIFICATION IN CLASSICAL GREECE

It is known that both Mycenaean and Dark-Age Greek were relatively ignorant of intensive farming. There were mostly wild olives and they produced erratically a poor quality of fruit with low oil content. Similarly, even species of productive grains were few. Wild vines also predominated. Wild varieties of olive trees and vines usually produce smaller harvest and poorer tasting fruit (Hanson 1995:33). Thus Mycenaeans were not yet making extensive use of the domesticated olive tree and they depended on oil from wild olive trees for their perfume industry. The economic base of the Mycenaean states was impoverished in the sense that it rested on a small range of what on the whole were rather primitive crops. The primitive husked wheats (emmer and einkorn) were still important crops and had not yet been ousted from Mediterranean agriculture by the naked wheats, which are used to make bread and other cereal products today (Sallares 1991:15). Consequently, we can say that before the rise of the Greek polis, less productive varieties of olive trees, vines, and cereals probably prevailed over domesticated species.

During the Classical Period Greek farmers intensified cultivation methods in cereal production. They stopped the two-field system that had been applied for centuries. Rather they tried to make cultivation every year on the more

arable lands and started to apply three-field system on the less fertile lands. They also attempted to utilize irrigation where it was possible. Greek farmers in Classical Period had quite well known that regular cultivation of sloping hillsides required well protection of the soil since the rate of erosion in the cultivating hillsides was much higher than in the flat areas. In order to decrease the negative effects of erosion on the hillsides they built terraces. Another advantage of terracing was that it could facilitate the irrigation in sloping lands (Dale and Carter 1955:100). In addition, manuring was also applied to increase the amount of cereal production. We can surely say that population growth is the most important reason which starts, drives and maintains agricultural intensification as it is usual in pre-industrial societies (Hanson 1995:37). In spite of these intensification practices the Greeks had understood that it could not possible to feed such an increasing population with only cereal production. They distinguished that vine and olive were much more suitable for their soils and amount of products from these two plants were much more those from the cereals. So they started vine and olive planting in the large orchards and processing their fruit to make oil and wine, which were exported to satisfy the expenses of other substances especially of grain import (Dale and Carter 1955:102).

I propose that there are four main indicators for agricultural intensification of Classical Greece: irrigation, terracing, manuring, and tower structures. In this chapter I will try to examine these indicators in the light of the literary sources and the archaeological evidences.

3.1 Irrigation

According to Gallant (1991:57) except for certain areas in which there are usually upland karstic basins or remnant lakebeds, Greece is not a suitable land for irrigation. The large rivers are few; therefore most surfaces run off

occur in steep torrents or in sheets. Hence, in Greek agriculture irrigation had a minor role until the advent of electric pumps and deep wells.

However, in Mediterranean climate, until the cultivated olive trees and vines have developed an extensive root system at their second or third year, they require irrigation regularly at and after the plantation. Moreover, particularly for soft-fruit harvests some supplementary water may be required for good production. It is not easy to dismiss the idea of ubiquitous irrigation on ancient Greek. In order to establish use of irrigation in the ancient Greek countryside, the vast communal projects and hydraulic dynasties in ancient Near East – elaborate dams, watering lifting devices and ditches - must not be envisioned. Instead of it, for reflecting their native terrain they fashioned new irrigation practices with their individualism. In Greece there is no enormous river running through flat expanses. This meant private, rudimentary efforts - like small diversion of wells, streams, springs, dams, retaining basins - for the Greek farmers on modest plots devoted gardens and the young olive trees' and vines' nourishment in newly established vineyards and orchards (Hanson 1995:60).

It is clarified by the Greek literature and archaeological evidence that for growing irrigated crops on their small farms, a variety of strategies were employed by the farmers (Hanson 1995:62). In Homer's *Illiad* (Book XXI) we can find the indications of irrigation systems:

> *As one who would water his garden leads a stream from some fountain over his plants, and all his ground-spade in hand he clears away the dams to free the channels, and the little stones run rolling round and round with the water as it goes merrily down the blank faster than the man can follow.*

Lohmann (1992:51) stated that in the vicinity of the actual farmsteads, retaining basins and dams are recognizable. These basins and dams

controlled one of the typical features of the Mediterranean climate, which are the destructive forces of the heavy rainfalls. For controlling the destructive force of winter rains, people built retaining basins and dams in the Classical Period.

Wagstaff and Gamble (1982:100-101) have showed the Melians' resolution for the water scarcity in the Classical Period. Assuming different rates of consumption, Table 2 shows the requirements of water for various population levels, and the demand is compared with the amount of water theoretically available to 5 people's household in condition that the maximum amount of water from a roof area of 56 sq m. collected by each of them. Deficits emerge at each level. As the geology of the island means that the drinkable water is reduced still further, in Melos the ground water supplies are excessively limited. In Classical Period and later the deficiency could be handled to some extent by artificial rainwater storage, for example in cisterns.

At a farmstead in Kambouri (Chios), a 8 m. in diameter well built circular water-basin (Fig.7) was found by Lambrinoudakis. It was suggested by him that coins and fine pottery fragments showed that the period in which the structure had been used was the Classical Period (Labrinoudakis 1984:297-299).

Murray (1984:199-202) stated that the non-existence of large rivers and extensive plains in Greece had not led to the great irrigation projects like that in Mesopotamia or Egypt; but the logic of irrigation was well understood and some local practices had been applied especially in the Classical Period. He suggested that the ancient dam of Mytikas Valley on the western coast of Akarnania (Fig.8 and Fig.9) was built probably between the mid-fourth and third centuries B.C. It was constructed on a narrow fountain, which permits flowing water to sink into the plain from a narrow secluded valley. There is

also a channel constructed for removing the overflow water into the ground. According to Murray existence of a water channel in this dam structure was most probably related to an irrigation system. This structure is a good example for hydraulic system described by Plato:

> *When they (rains) come down from the mountains into the hollow dells; and shall keep in the overflow by the help of works and ditches, in order that the valleys, receiving and drinking up the rain from heaven, and providing fountains and streams in the fields and regions which lie underneath, may furnish even to the dry places plenty of good water. The fountains of water, whether of rivers or of springs, shall be ornamented with plantations and buildings for beauty; and let them bring together the streams in subterraneous channels, and make all things plenteous (Plato Laws VI).*

3.2 Terracing

Another indicator of agricultural intensification in Classical Greece is terracing. Terraces that have significant importance to interpret the ancient landscapes are the most plentiful and obvious cultural elements of many parts of Greece (Rackham and Moods 1992:123). Hanson (1995:80) stated that by the Classical Period farmers started to build terraces in almost every part of Greek Countryside. He pointed out that terracing was a process, which required huge investment of time and capital; inserting marginal hillsides in agriculture by terracing were related with the increasing importance of vines and olives and with the new type of intensive production.

By the help of modern practices and archaeological investigations it is possible to classify ancient terraces into three types as stepped, braided, and pocket terraces (Fig.10). Stepped terraces are straightly parallel to each or in the shape of trapezoid. If they were surrounded by well-built enclosure walls the purpose was most probably vine cultivation (Fig.11). Braided terraces crisscross the land quite irregularly. If there has been a threshing-floor near

the braided terraces it is quite possible to suggest that these terraces were used for cereal cultivation (Fig.12). The aim in building pocket terraces is to protect and hold the roots of planted trees, particularly olives. There were mainly six purposes of terrace building in ancient Greece:

1) Arable soils on limestone bedrock tent to accumulate in small pockets. By terracing it is possible to redistribute them to the surface.
2) Root penetration is important for olives and vines especially their first years of planting. By terracing hard soils are fragmented so the roots of plants can get sufficient moisture from the ground.
3) Terracing is a good solution to make a gentle surface for cultivation.
4) There are various types of soil erosion; however by terracing at least two types of it (sheet and gully erosion) can be taken under the control.
5) Rainfall regime of Greece is irregular so it sometimes causes summer droughts. Terraces increase water-absorbing capacity of soils thus they can preserve their moistures in the hot summers.
6) Generally agricultural lands of Greece are stony. Ancient Greek farmers had to clear the stones from their fields before the cultivation. So, they possibly used the interfering stones to make wall of terraces (Rackham and Moods 1992:123-124).

Agricultural terracing, which was a well-known characteristic feature of the ancient landscape, have been the subject of many archaeological surveys carried out in Greece. They also characterize the rural part of the country and give significant clues to archaeologists for explaining ancient land using patterns and agricultural practices of ancient Greek society (Price and Nixon 2005:665). According to Foxhall (1996:44-45) the terraces of Greek landscape could not be dated to the Classical Period there is no satisfactory description or reference of terracing in ancient literary sources. However,

various archaeological surveys conducted in the rural parts of Greece presented the concomitant existence of terraces and classical farmsteads. In traditional or modern landscapes of Greece agricultural terraces and terrace walls can be easily observed. However, detection of ancient terraces is not always easy. Price and Nixon (2005:670) suggested some criteria for dating existing terraces that at least some of them can be applied to any given landscape of rural Greece. These criteria can be listed under nine headings as:

1) Dating the artefact founded in the fill of terraces
2) Dating the age of trees on terraces and comparing them
3) Comparing construction style of terraces with similar ones
4) Comparing construction style with that of ancient structures near to them
5) Regarding their proximity to ancient structures
6) Comparing their lichenization character with that of adjacent structures
7) Regarding the degree of their degradation
8) Defining them as a single-period used structures
9) Relating them to the need of agricultural intensification

The first and the second criteria can give exact date for the construction of terraces but most of the time they rarely work since it is difficult to find datable artefact in the fill or survival trees on terraces. Thus, Price and Nixon (2005:670-671) have attempted to test the validity these criteria on Delos and Keos:

> *On Delos, in the south-eastern and northern parts of the island, there is extensive terracing, in one case protected by enclosure walls presumably to permit concurrent pastoral use of the area. The terracing is similar in construction style to ancient houses on the island (criteria 3 and 4). Some of the terraces have been*

partially excavated and dated on the basis of pottery in the fill to the Classical and Hellenistic Periods (criterion 1). The terraces are accompanied by and associated with 16 small, ancient farm sites (criteria 4 and 7). As it is hard to imagine a later period when extensive agriculture needed to be practiced on this island (criterion 9), it is likely that all the terraces in this area date to those periods. In other words, Delos is a clear example of an ancient "relict landscape," of Classical or Hellenistic farms set among agricultural terraces (criterion 8)…On Keos, Greek survey work has identified numerous ancient terraces in association with Classical and Hellenistic sites. The arguments are based on construction style (pseudo-isodomic or even pseudo-trapezoidal terraces should be Classical (criterion 3); some terraces are associated with dated sites and have similar construction to adjacent buildings (criterion 4). The Classical Period is the only time before the 19th century when there was great pressure on agricultural resources (criterion 9).

3.3 Manuring

Manuring practice of ancient Greek farmers is also a good indicator for agricultural intensification. In Chapter 1 we have seen from the ancient sources that manuring was an important process in agriculture. So, what are the archaeological evidence that demonstrate the intensive application of manuring to the agricultural fields of ancient Greece? Bintliff's and Snodgrass' interpretation about the low density of off-site artefactual scatters detected in the archaeological survey studies in the Greek landscape might give an answer to this question. Bintliff and Snodgrass claimed that the primary factor for low density scatters of artefacts over the rural landscape was manuring. Giving reference to Homer (see Homer *Odyssey* XVII) they stated that storing manure and spreading it over the agricultural fields, as a fertilizer was a well-known practice in the ancient Greek world. They proposed that organic wastes, household rubbish and cultural debris were systematically collected both in rural and nearby sites to be spread on the agricultural fields as fertilizer. As a result of this manuring practice organic components of manure had decayed but artefactual components (especially

pottery fragments) of it remained in the soil that can be detected in archaeological surveys (Bintliff and Snodgrass 1988:508).

Bradley's interpretation on the 4th century B.C. houses at Halieis supports the idea that manure was collected not only in the country but also in the domestic structures of town. In the several excavated houses at Halieis there are some stone-lined pits in several size. Bradley (1999:550-554) stated that they were regarded as cellars. However, he identified these features in three houses, which are House A, House B, and House 7 (Fig.13-14-15) as *koprones* in which household wastes were being collected. Bradley explained that these structures could not be regarded as cellar since there were much suitable areas of the houses for storage, which had named in ancient sources as *pitheon* or *tamieion*.

3.4 Towers as an Architectural Feature of Agricultural Intensification

Towers were the center of a number of different activities such as guarding the harvest and the harvesters, watching for invading summer-time armies, keeping an eye on animals grazing fallow and their keepers, and storage. In relation to the seasonal use and occupation of the countryside, they may fit more than one pattern (Foxhall 2000:489). However, it can be also thought as an indicator of agricultural intensification because of co-existence of the towers integrated to or around the farmsteads. In this respect, it is absolutely necessary to delineate how they related with the agricultural production system.

In his research Young investigated six ancient tower structures at Sounion, South Attica, and he came to the conclusion that except one tower, which probably related to the mining industrial production, all the other five towers

were the operative for the process of agricultural production. The towers, studied carefully by Young are The Princess Tower, The Cliff Tower, The Golden Pig Tower, The Yellow Tower, the Red Tower and the Hilltop Tower.

The Princess Tower (Fig.16) is circular in plan, outer diameter 5.50 m., in a courtyard with other buildings. Near to this tower an ancient threshing-floor was discovered and it seems to be connected with the ancient farming. Moreover, the great number of potsherds found in the site provide us that they belong to the late 5th to 4th century B.C. and the 2nd and 1st centuries A.D. However, the high number of pottery fragments were dated back to the 5th century B.C. and proved that these structures should have been built and occupied between 450 – 425 B.C. The Cliff Tower (Fig.17) is also circular in plan and 5.20 m. in diameter. Like the Princess, there is a heavily terraced threshing-floor located on the southeast close to the Cliff Tower. The place where the threshing-floor was located, open to both easterly and westerly winds and it makes it an ideal for winnowing. On the other hand since the terrain is not so suitable, building a threshing-floor required much more effort. On the southwest of the tower there found a rectangular house. The low density of sherds in this site was probably the natural result of the high rate of the erosion on the surfaces, however these founded sherds dated the whole structures to the 4th century B.C. Unlike the Princess and Cliff Towers, The Golden Pig Tower (Fig.18) is rectangular and 6 m. in diameter. There is an evidence of another structure on the surface of one big marble block, which is bedecked with three rows of perpendicular furrows. Moreover, behind the tower there was an ancient well. The associated sherds and the architecture of the building indicate to late 4th or early 3rd century B.C. The Yellow Tower (Fig.19) is oblong in shape and 6.60 x 4.10 m in diameter. There was an ancient cistern, which is now filled in, and a built channel, probably used for drinking water. Even if there were extensive ancient mining remains around the tower, there seems no connection between them. The sherds found at

the site date back to the 4th century B.C. The Red Tower (Fig.20) was rectangular in shape and 4.35 x 4.40 m in diameter. After building the tower, a rectangular construction was added opposed to the east wall. Sherds found around the Red Tower dated from the 4th to 2nd centuries B.C. The Hilltop Tower (Fig.21) was square in shape and about 6.50 x 6.50 m. in diameter. Opposite of the east corner of the tower situated a cemented settling-basin and a channel. It seems like these structures were related to the silver-mining industry. However, the tower was built after the silver mining. There are some sherds around the tower, which date back to the 5th and 4th centuries B.C., but it is not easy to link these remains directly with the tower. On the other hand the type of masonry represents the characteristics of 5th and 4th centuries B.C. that gives us a clear idea about the time of construction of the tower (Young 1956: 124-131).

At first glance it may be difficult to reach the result that these towers were used as agricultural or farming purposes. However, as Young points out, all the evidence actually related directly with farming or at least with associated industries, and in fact they are parts of country estates. First of all, Agrileza Valley in which the Princess Tower situated, today extensively cultivated with grain. Thus there is no doubt that the main purpose of this estate was agricultural, i.e. milling of grain. According to Young, the grain threshed on the circular floor outside the enclosure wall may have been milled on the ground floor of the tower, the final product kept on the upper floors (Young 1956:141). In the same way, because of the existence of a threshing-floor in the Cliff Tower, we can assume that this estate's holder also raised grain most probably on the terraces near his estate. The other towers except the Red one, today located in highlands covered by maquis, as a result of the deforestation of these areas for the purpose of obtaining fine cultivable land in ancient times. Thus, standing on the fine cultivable lands, all five towers used for crop processing and storage. Moreover, as already mentioned in the

beginning of this chapter about the increase in population, there was also a necessity for urgent subsistence needs since the mining industry centers with increasing population were near to these estates.

CHAPTER 4

ARCHAEOLOGICAL SURVEYS AND COUNTRYSIDE IN CLASSICAL GREECE

4.1 History of Archaeological Surveys in Greece

After the World War II, like in the other parts of the world several archaeological survey projects started in the Mediterranean area and these survey-oriented researches have significantly changed the traditional aspects of archaeological investigations (Dyson 1982:87). Although the growth rate of these survey studies has not been same in everywhere however, one can easily recognize the overall increase in the regional survey projects all over the world (Alcock and Cherry 2004:1).

However, in these early years of regional studies, survey has been rarely accepted as an independent technique from excavation. Alcock and Cherry (2004:3) stated that in earlier years archaeological survey was regarded as an instrument for recording sites and monuments or as a first step of excavation.

One of the main reasons behind this situation was that most of the surveyors have been trained as classical archaeologists. So they were interested much more in the monumental structures and sculptures and they were trying to reconstruct the elite class of the society in the studying areas (Dyson

1982:88). Thus compared to other regional studies in the world especially in America, the survey archaeology of the Classical Lands in the 1950's was more conservative. However, this situation started to change in the 1960's and the 1970's. The founding of interdisciplinary graduate programs in Indiana and Minnesota University, the establishment of the Association for Field Archaeology, and the publication of Journal of Field Archaeology were the institutional changes that accelerated the development of survey studies in the Aegean region (Fotiadis 1995:66-67).

In the 1960's and the 1970's archaeologists together with historians and geographers started to design field survey projects for the Greco-Roman world. In some cases, these surveys were conducted by very few people but generally the projects were carried on much more systematically by larger teams (Shipley 1996:7). Minnesota Messenia Expedition in the 1960's and the Melos project in the 1970's have accelerated the survey-oriented researches in the Aegean archaeology. These projects have shown that survey as an archaeological tool has a great power in understanding the past settlement patterns. Although these projects were concentrated highly on the Bronze Age, classical archaeologists saw quickly the potential and applied the techniques of those projects to the later periods. Thus site-oriented studies were highly abandoned by archaeologists and they started to give credit to the new projects that direct to understand the entire landscape (Morris 1994:6).

In the 1980's there has been a radical increase in the number of archaeological surveys in Greece. Economic, political and intellectual changes could be accepted as the main factors behind the growth of survey works (Morris 1994:6). Shipley (1996:6-7) has successfully summarized the factors behind the increment of archaeological surveys in that time:

> *With the increasing availability of air travel, the growth of higher education in the United Kingdom and other countries, and the rise archaeological departments, there were opportunities for students and scholars to visit Greek and Roman lands more often and greater in numbers. It can be no coincidence that there was resurgence of historical writings that sought to illuminate the political and economic history through an awareness of the geographical setting. These were part of a movement towards regional studies linking landscapes with history more integrally. Aspects of the ancient economy were increasingly studied through a combination of literary, documentary, and archaeological evidence.*

The 1981 American School of Classical Studies at Athens Conference and the 1980 Sheffied Conference have indicated that as a result of changing economic and political considerations of 1980's the costly massive excavations could not be supported anymore. So many classical archaeologists started to give their efforts toward the low-budget survey projects (Dyson 1982:89-90).

Early systematic surveys in the 1950's and the 1960's were extensive and topographic. The Minnesota Messenia Expedition was a good example of this type of surveys (Galaty 2005:295). However, in the late 1980's and the 1990's regional studies in archaeology had entered a new phase. Cherry (1994:92) named this as "new wave". Cherry's "new wave" of surveys was intensive and not topographic that meant the main objective of these were to investigate all landforms to avoid the effects of geographic bias (Galaty 2005:295).

Bintliff (2000:3) stated that the regional projects such as in Laconia, Kea, Argolid, Methana, Boeotia, Nemea were good examples of breaking the extensive survey tradition in the Aegean region. For this new type of intensive surveys, with systematic field-walking techniques, recording off-site information was important as well as on-site information.

Alcock and Cherry (2004:3) have successfully listed the sharing features of newer-style survey projects that are distinguishable from the earlier ones:

> *-A clearly demarcated territory as the target of fieldwork.*
> *-The region itself as the focus of research design.*
> *-The use of labour-intensive pedestrian survey by teams of surveyors.*
> *-A more systematic approach to the coverage of terrain, often involving explicit sampling designs.*
> *-An interest in recovering information about the full range of archaeological phenomena surviving on the surface, including very small scale sites and often non-site or off-site artefact distributions as well.*
> *-The full integration within project design of studies of erosion, alluviation, soil formation, coastal change, vegetation history, etc., since landscape settings are not static and are themselves impacted by human occupation.*
> *-The expansion of regional projects to become progressively more multi or interdisciplinary.*
> *-A growing interest in the material culture or regional archaeology of the Mediterranean in periods hitherto undervalued or poorly studied by earlier surveys.*
> *-Greatly increased use of relational databases, GIS and the Internet for storing, analyzing and serving data.*

4.2 Defining the Classical Farmstead

Most scholars seem to agree on that in all eras of Greek history, the ancient Greek farmers including the poor and the rich commuted to work from the neighbouring village. Scholars interpret absence of isolated farmhouses to the desirability and the necessity for communal villages to protect from theft and enemy invasion as well as geographic reasons such as the water scarcity in the Greek countryside and underemployment of non-irrigated extensive agricultural practice. On the other hand, the desire for a new rural identity, need for constant labour and the importance of small-scale irrigation

projects along with the delivery of water that actually argue for the notion of dispersed homestead farmhouses (Hanson 1995:51).

According to Hanson (1995:52), information from preserved farm sites makes perfect sense if one keeps in mind a literary tradition that reflected the dispersed life of Athenians on the countryside. In the ancient texts of Homer and Aristotle we can find the indicators of this dispersion:

> *Thus did they converse in the house of Hades deep down within the bowels of the earth. Meanwhile Ulysses and the others passed out of the town and soon reached the fair and well-tilled farm of Laertes, which he had reclaimed with infinite labour. Here was his house, with a lean-to running all round it, where the slaves who worked for him slept and sat and ate, while inside the house there was an old Sicel woman, who looked after him in this his country-farm (Homer Odyssey XXIV).*
>
> *Such was the origin and such the vicissitudes of the tyranny of Pisistratus. His administration was temperate, as has been said before, and more like constitutional government than a tyranny. Not only was he in every respect humane and mild and ready to forgive those who offended, but, in addition, he advanced money to the poorer people to help them in their labours, so that they might make their living by agriculture. In this he had two objects, first that they might not spend their time in the city but might be scattered over all the face of the country, and secondly that, being moderately well off and occupied with their own business, they might have neither the wish nor the time to attend to public affairs. At the same time his revenues were increased by the thorough cultivation of the country, since he imposed a tax of one tenth on all the produce. For the same reasons he instituted the local justices,' and often made expeditions in person into the country to inspect it and to settle disputes between individuals, that they might not come into the city and neglect their farms (Aristotle The Athenian Constitution XVI).*
>
> *That tyranny has all the vices both of democracy and oligarchy is evident. As of oligarchy so of tyranny, the end is wealth; (for by wealth only can the tyrant maintain either his guard or his luxury). Both mistrust the people, and therefore deprive them of their arms.*

Both agree too in injuring the people and driving them out of the city and dispersing them (Aristotle Politics V.10).

The structure of the Vari house that was investigated by the British School at Athens in the 1960's was one of the best examples of excavated and published farmsteads. The structure was interpreted as small country house in which small farming families had lived for one or two decades during the 5th and 4th centuries B.C. (Pettegrew 2001:192).

The Vari House (Fig.22) was a rectangular shaped, block attentively located on a site which needed a hard work on levelling and terracing to get the surfaces demanded. The external size of the south side measured 17,6m, whereas the north side measured 17.7m, the west 13.7m, and the east measured 13.85m. Internal measures were 16.4m x 12.5m. A superstructure of mud-brick raised upon the establishments of ground plan which was corroded. The roof was made of timber-beams and rain tiles which presumably had been saved long ago as worthy building material. Lying down on the hill south of the house was a much wider and longer enclosured with low and rough boundary-wall. Figure 23 shows the plan of the Vari House. Eastern half of the house was irregular in shape whereas, the western half of it was rectangular (Jones *et al.* 1973:360-370).

The Vari House had been identified as an isolated country house. The general isolation of the house in the countryside, abandoned terraces around the house and the certainty that economy of most Attic *demes* was depended on agriculture have made possible to regard the house as a farmstead (Jones *et al.* 1973:418-419).

There is a question that how and why the farm residence was integral to the rural system of Greek World. First of all, a farmhouse may be seen as an

effort on the farmer's part to protect and enhance his property. Hence, these residences should be seen as reflection of the growth of private property and the control of individuals over agriculture (Hanson 1995:53).

Archaeological surveys on the Aegean island of Melos showed that each day the modern Greek farmers spent a mean time of two hours fifty-five minutes on travelling to work (Wagstaff and Augustson 1982:108-110). In Greece, the negative direct and indirect influences of irrational farm fragmentation were serious and far-ranging, reaching into every aspect of the land use in 1960's. The utilization effort of the land which was divided into small, numerous, separate parcels caused wastages of time, capital and effort. The shifting from one plot of land to another brought the unproductively and wearingly occupation of animals, equipment and labour (Thomson 1963:10).

There is no doubt that the nucleated settlement is related to the fragmentation of the land holdings; on contrary, the farmsteads generally illustrate consolidated farms. It is also clear that there is a great reflection of farmstead's presence in the agricultural infrastructure. When planted, there should be a constant attention given to the capital crops like olive trees and vines such as providing extra irrigation and fertilization, protecting them from animals. Instead of constructing costly fencing for these capital crops, the agriculturists often had to spend most of their time on their farm (Hanson 1995:54-55.).

4.3 Classical Farmsteads in Archaeological Surveys

The intensive surveys, which will be investigated as case studies in this chapter in terms of their approaches and interpretations of the Classical

farmsteads are Southern Argolid, Attica, Oropos and Boeotia projects (Fig.24).

4.3.1 Southern Argolid

One of the main purposes of the archaeological surveys, which conducted in the Southern Argolid (Fig.25) from 1972-1983, was to determine the settlement pattern beginning from the Stone Age to the historical periods. Another central objective was to synchronize this settlement history with the available results of excavations and historical resources. The detected sites throughout the surveys were attributed to two essential groups in respect of their functions as habitation and special purpose sites. These were also divided into sub-groups (Table 3). The size, the existence of architectural and artefactual remains, and the different groups of cultural remains with their amount of number were the criteria used to recognize the habitation sites. For instance, a small (less than 0.5 ha) single site with remains of a rectangular building can be identified as a farmstead. Besides, possibly finding fragments of roof-tiles, storage vessels, cooking and fine wares, lamps, millstones, oil-press, and may be pieces of stucco from floor or wall in or around this small site strengthened the identification of it as a farmstead (Jameson *et al.* 1994:215-248).

In Table 4 the main functions of sites are demonstrated by each archaeological period. Even from this simple table we can distinguish two considerable distinctions of site functions in different periods. First, the number of towns, which are the indicators of the settled life, peaked in the Classical Period. Second, isolated farmsteads were surely evidenced by the Archaic Period but their number considerably increased in the Classical Period and reached its acme during the late 4th century B.C. (Jameson *et al.* 1994:250).

In Table 5 shows the size of sites distributed by the archaeological periods. A considerable decrease in the quantity of medium-sized habitations and raise of small sites is distinguishable in the Late Bronze Age but it is most conspicuous by the late Classical Period. For this period the size of single component sites were measured as the mean number of 0,11 ha. Similarly the size of sites with tower structures, which were identified as farmsteads, were calculated average of 0,16 ha. From this point Jameson *et al.* (1994:254) stated that if they only considered the size of the sites it might be possible to evaluate almost all the small habitation sites as farmsteads. But they emphasized the necessity of looking the other criteria before interpreting all small habitations as farmstead.

Investigating agricultural exploitation of the Southern Argolid, Jameson (et al) suggested that there are two opposite scholarly views about ancient Greek agriculture. According to traditional and “pessimistic” view there was no technological improvements and no clues of intensification of agriculture in the course of classical antiquity. However, in recent studies this view started to be challenged. The newer and “optimistic” view of agriculture argues that there were several forms of intensification in agricultural production system of ancient Greece such as diversification and there were improvements of land using by terracing, manuring, and irrigation. Jameson (et al) proposed that the latter “optimistic” view of ancient Greek agriculture seems to be more acceptable. But, they also suggested that strategies were preferred to be used in any particular system of agriculture depended on specific conditions so it is not a surprise to distinguish both intensive and extensive regimes of ancient agriculture in the same region (Jameson *et al.* 1994:282).

In the Southern Argolid the most remarkable changes of the site distribution started in the late 4th century B.C. After a long time occupation most of the villages and hamlets were abandoned or decreased in size. However, at the same time we can observe the increase in the quantity of small sites some of which were furnished by tower structures. The pottery found on these small sites include fragments of large storage wares. They are most probably related to olive-pressing equipments such as press beds and weight stones which have been found on fifteen sites of surveyed area that seven of those were identified as farmsteads (Table 6). Archaeobotanical studies which shows the considerable increase in the quantity of olive trees in Classical Period proved the importance of olive production in the Southern Argolid at this period (Jameson *et al.* 1994:383-384).

The majority of the small-size sites found during the surveys located on the alluvial soils, which although gave better opportunity for olive planting than cereal cultivation, were also sufficient for mixed cultivation. The density of sites and their equipments of olive production showed that there was agricultural intensification with highly concentration of olive culture in a mixed production system, which also offered subsistence from other crops like cereals and vines. The small size of the sites and the variety of artefacts found on these sites implied that they are individual farmsteads used as seasonal or permanent residences. Moreover by the late 4th century B.C. we can observe a considerable decline in the quantity and the size of villages and hamlets. Increasing number of isolated farmsteads and simultaneously decreasing that of villages and hamlets suggest that there was dispersion in the pattern of rural settlements (Jameson *et al.* 1994:385).

At the surveyed area of Flamboura seventeen small sites have been found and except three of them they were identified as farmsteads most of which

dated as late as the 4th century B.C. Their connection to each other and to ancient streambeds give us approximate size of their land properties such that the smallest of which is 5,5 ha and largest one is 22,5 ha. (Jameson *et al.* 1994:387). Figure 26 shows the possible land division between these farmsteads. According to Cooper (1977:163) for the 5th and the 4th centuries B.C. estimated land property size for an individual farmstead was about 3.6 – 5.4 ha. However, even the smallest land property size of farmsteads in Flamboura is higher than this estimation. So, if we consider the property size of farmsteads and the agricultural intensification (especially in olive production) together it is possible to suggest that in the 4th century B.C this type of agricultural system would have been necessitated more labour force (hired or slave) than that provided by a nuclear family. Nevertheless, it will be wrong to evaluate these land properties as the estates of absentee owners cultivated totally by tenant farmers or slaves (Jameson *et al.* 1994:388). Rather they probably still belonged to the individual *oikoi* in which the requirements of more labour force as a result of agricultural intensification satisfied by hired labour and slaves.

4.3.2 Southern Attica

Between the years of 1981-1989, Lohmann conducted an archaeological survey near the south-western tip of Attica, in the valleys of Charaka, Aghia Photeine, Thimarei and on the island of Gaidouronisi (Fig.27). In the nine campaigns of eight year field work almost 20 kilometres-square area have been surveyed intensively and more than 250 sites (dated from the final Neolithic to the modern periods) were found. For the Classical Period Lohmann suggested that the survey made considerable additions to our understanding of ancient Greek agriculture and the Classical settlement pattern of Attica. He stated that by the help of ancient texts of Strabo (*Geography* IX.1.21) and some rock-cut *horos* inscriptions the surveyed area

was identified as the Classical *deme* of Athens. The settlement pattern of the region reflects absolute dispersion such that no village or *deme* center was detected throughout the survey however more than 30 farmsteads were found. Most of these farmsteads were furnished by farmhouse towers, threshing floors, oil presses and millstones. Besides, in most slopes of the valleys nearby the farmsteads there are terraces, most probably related to intensive production of olive oil in the 4th century B.C. (Lohmann 1992:29).

The Classical Period of the 5th and 4th centuries B.C. witnessed the greatest success of economy and the highest density of population in the area. However, after the 4th century B.C. a sudden change took place; most parts of the region were abandoned and depopulated. Lohmann claimed that almost all of the structural remains such as farmsteads and agricultural terraces date to Classical Period. He proposed that in addition to the nucleated settlements, high number of scattered individual farmsteads is characteristic feature of the settlement pattern in Classical Attica. Most of the farmsteads found during the survey were well equipped with towers, courtyards, and threshing floors (Fig.28). Lohmann (1992:39) stated that these towered farmsteads are quite similar to those that published by Young (see in Chapter 3) and he confidingly regarded them as agricultural estates.

According to Lohmann in addition to their function of defence these farmhouse towers were used as living residences and storage places. Figures 29 and 30 demonstrate the farmhouse towers C and F in the valley of Megalo Vathychori in the Megaris. The entrances of the towers are at ground level and they have tiled roofs different from those, which were built for military purposes. Moreover the other structural remains found in the vicinity of these towers were surrounded by courtyard walls. The modest thickness of these walls indicated that they could not stop any attack from the enemies so they could not have been built for defence purpose. Lohmann

accepted the existence of military purposed towers (Fig.31) such as watch and signal towers in the region but he suggested that they are few in number and they can be distinguished from the farmhouse towers by their sophisticated fortifications, greater wall thickness, elevated entrances and locations on the hill tops (Lohmann 1992:39-40).

There are two large Classical farmsteads in Palai Kopraisia, which is a region at 2 km north of Legraina. First one of these farmstead (Fig.32) lying in the southeast was identified as a towered estate. The other farmstead (Fig.33) in the western part of the hill has an *andron* and surrounded by a courtyard wall, which dates back to the 4th century B.C. Figure 34 shows the reconstructed model of this farmstead. A vast threshing floor, 22 m in diameter, and agricultural terraces on the northern slopes provide evidence to the cereal and olive cultivation in the farmstead. In addition to these threshing floor and terraces there have been found some fragments of millstones and olive press, which can be also considered as the proves of agricultural intensification (Lohmann 1992:42).

Lohmann (1992:49) stressed that farmsteads with or without tower represent the characteristic of rural settlement pattern in Classical Attica. Besides he disagreed the view that they were used as only seasonal residences for agricultural purpose. He suggested that existence of graveyards (Fig.35) near the farmsteads supports the idea that most of the farmsteads served permanent dwellings for Greek farmers through the Classical Period.

Most scholars who are studying economic history of ancient Greece asserted that in the course of Classical Period agricultural lands were fragmented in unprofitable small units within a few generations as a result of the inheritance system. They suggested that as a result of this land partition the only

possible form of land property was poor and small peasantry. However, Lohmann stated that his survey of the southwest Attica pronounced a different story. The 33 classical farmsteads were found during the Lohmann's survey and 8 or 9 of them could be described as big estates belonging to the rich farmers with the land properties of each were almost 25 ha. Lohmann considered that in Attica and Megaris during the 4th century B.C. there seems to be a concentration of land property in the hands of big farmers (Lohmann 1992:51).

According to Lohmann (1992:51) there was a close link between the farms of big owners and the large terrace complexes. Figures 36 and 37 well demonstrate the Classical farm estates with agricultural terraces at Aghia Photeine and Charaka. Surface finds and architectural resemblance with farmhouses proved that these terraces also dated to the Classical Period. Lohmann proposed that Greek farmers in Classical Attica terraced almost all available slopes for olive cultivation. According to Lohmann there are two possible reasons for this intensive terracing. First, there was a population increase in Attica during the Classical Period so there was a necessity to make intensive cultivation to feed this increasing population. The intensive terracing of marginal slopes was probably a reaction to the scarcity of cultivable lands. Second, olive oil of Classical Attica was famous with its high quality and most profitable agricultural product in the market so farmers most probably wanted to increase the amount of olive production by intensive terracing.

4.3.3 Boeotia

In the Boeotia Survey the sites dated from the 6th to the 3rd centuries B.C. were grouped together as "Archaic to Early Hellenistic" Periods. There is no sign of occupation for these sites earlier than the 6th century B.C.

Archaeological evidence suggests that majority of them were occupied after the mid or late 5th century B.C. Most of these sites continued to be used through the 4th and the 3rd centuries B.C. Figures 38 and 39 show the great density of site distributions of these periods over the landscape. The most significant feature of these sites is that they are relatively small in size. 45 of the total 66 sites were measured something like 0,50 ha or less. Their small size and observed materials such as roof tiles and household potteries suggest that they were individual farmsteads that were probably occupied at least during some part of the Classical Period. The size of some Classical sites are not so small, ranging between 1,0 ha and 2,5 ha, perhaps they were ranked also as small settlements (Bintliff and Snodgrass 1985:139).

Ancient sources and dramatic increase in settlement numbers discovered by the archaeological surveys indicated that population of Greece considerably increased in the course of the Archaic and Classical Periods. Almost 90% of sites detected during the Boeotian Expedition show occupation in the late Archaic to early Hellenistic Periods. The archaeological evidence suggests that most of these sites were occupied at least some part of the 4th century B.C. which represents the zenith of dispersed settlement pattern in the region (Bintliff and Snodgrass 1985:141).

By counting and mapping the density of off-site surface artefacts Bintliff and Snodgrass (2005:136) observed continuous artefact scatters over many square kilometres of the Boeotian landscape. As mentioned in Chapter 3 Bintliff and Snodgrass (1988:508) suggested that the density of off-site artefacts observed during the Boeotia Survey indicates the ancient agricultural practice of manuring.

Figure 40 shows the rural settlements in 5,2 square kilometre part of the region intensively surveyed during the Boeotia Project. Except one (LSE2),

which is probably a prehistoric site, all of these sites were identified as farmstead settlements of historical periods. Figure 41 demonstrates these farmsteads and the density of off-site artefacts around them. In this figure continuous off-site pottery distribution like an “unbroken carpet” between the settlements is highly remarkable. A sample of this off-site carpet-like scatters that surround the rural sites shows very high density of sherds dated to Classical Period (Fig.42). This can be explained by the fact that the ancient city of Thespiae in Classical Period was twice larger than later periods. It is most probable that the inhabitants of the Classical Thespiae accumulated their household and farmyard rubbish with their broken pottery and carried them into their agricultural fields as fertilizing manure. Evidently, as a result of urban-derived manure scatters density of off-site artefacts around the rural settlements nearest the Thespiae city was higher (Fig.43). On the contrary, the sites located distant from the city or at the steep slopes were characterized by low-density of off-site material (Fig.44). However, it is still possible to follow “haloes effect” of off-site scatters around the rural sites located in considerable distant parts from the city center. This situation can be interpreted such that the inhabitants of these settlements also tried to increase their agricultural production by applying manuring practice to their fields (Bintliff 2005: 137-141.)

4.3.4 Oropia

The Oropos Survey Project directed by Michael B. Cosmopoulos covered a significant part of the Oropia (Fig.45), ancient territory of Oropos, during the six campaigns of field study between 1989 and 1995. Cosmopoulos stated that in the beginning of the survey project the aim was to detect and record new archaeological sites of the region; however at the end reconstructing and explaining the changes of rural settlement pattern and its impacts over

the rural history of the region became the major purposes of the project (Cosmopoulos 2001:1).

According to Cosmopoulos (2001:20) after domestication, agriculture was the most important factor for the economies of pre-industrial societies. The environmental conditions such as climate and size of arable lands, available technologies such as ploughs and fertilizers, agricultural labour and system of land ownership were the factors, which determined the modes of production in pre-industrial economies. Production for subsistence and production beyond the subsistence were two possible modes of production for ancient societies. In the first one the aim was to satisfy basic needs of an individual household or a small community by agricultural production. However in the other mode of production the aim was to satisfy non-survival needs such as ritual and exchange, to support non-farmers such as craftsmen and administrators of the society. Cosmopoulos (2001:20) stated that these modes of production also determined the types of exploitation of agricultural lands:

> *Depending on the mode of production, different exploitation strategies are employed: intensification (maximization of production through increased labour and/or exploitation of marginal lands), extensification (large-scale selective exploitation of natural resources), and specialization (concentration on the production of specific crops. Assuming that environmental conditions remain, in general, stable, such strategies would be reflected in different patterns in the archaeological record of the rural landscape; it is generally accepted that intensification is marked by increased human presence in the countryside, especially in non-optimal areas, and extensification by sporadic signs of human presence mostly around primary centers; specialization can be detected mainly through botanical analyses from excavated samples, hence it is not traceable by archaeological surveys.*

The size, function, continuity, hierarchy of sites and their arrangement in the physical space, which could be distinguished in the archaeological record, are used to classify the rural settlements. Particularly the last factor is very important for archaeological surveys. Because, the relationships between the center and the periphery are explained by the spatial arrangement and physical characteristics of sites. For a single site these relationships can be examined through its size, continuity, and function. In order to identify center and periphery relationships at the regional level it is necessary to investigate the spatial and chronological relations of sites and to consider their process of nucleation and dispersion. Cosmopoulos suggested a model for dispersion of rural settlements. According to him there are two types of dispersion. In the first type of dispersion (Fig.46) a number of settlements in a newly inhabited area extensively exploit the agricultural resources of the region. The second type of dispersion (Fig.47) takes place in the case of spreading from a primary settlement to the rural areas as a result of population increase or pressures for agricultural intensification (Cosmopoulos 2001:21).

In the Oropos Survey Project archaeological findings were defined into two distinctive categories as findspots and sites. Any concentration of artefacts no matter how they were small in any location was settled as a findspot. This category is a comprehensive one that also includes non-sites or off-sites materials. A site is also defined as a findspot but there are some distinctions between them on the basis of the amount and character of the surface finds. During the survey a findspot with substantially higher frequency and concentration of architectural or diagnostic artefacts was identified as a site. In terms of function of the sites their physical characteristics, size, architectural and other artefactual elements determined the criteria of their classification. Table 7 shows these criteria used in the Oropos Survey; according to them rural settlements of the Oropia were classified as habitation and special function sites. Cosmopoulos expressed that on the

basis of these criteria majority of the small habitation sites were classified as farmsteads. On the other hand certain types of function sites such as cult places or industrial sites were less or not represented (Cosmopoulos 2001:24).

During the Oropos Survey only a small Archaic site was detected. It seems to be a farmstead, most probably occupied for the first time during the late Archaic Period and continued to be used in the 5th and the 4th centuries B.C. After a long period of abandonment, Oropia was reoccupied in the 5th century B.C. with seventeen certain and three possible small rural settlements (Fig.48); their size range from 1 to 4,5 ha. All of these small sites were settled in proximity to each other and cultivable lands. Besides their locations are not so distant from the Oropos town. This situation suggests that farmers resided in the town and commuted daily to their fields. However, in the last quarter of the 5th century B.C. Athenians possessed land in the Oropos and they established a sanctuary dedicated to hero Amphiaraos (Fig.49). So in the late 5th century B.C. the rural sites in the close proximity of this sanctuary could have been permanently inhabited by the Athenian people (Cosmopoulos 2001:57).

The quantity of rural sites of the Oropia with considerable archaeological material indicates that the area continued to be inhabited in the 4th century B.C. In addition to the all 5th century sites, which were also used in the next century, nine new habitation sites that come to be used for the first time during the 4th century B.C. (Fig.50) Generally the 4th century sites were small in size (0,7-4,5 ha.). Although some standard elements of classical farms such as towers, courtyards, and threshing floors were not detected in these rural sites, the other artefactual materials such as roof tiles, storage vessels

and fine glazed pottery suggest that they were used as farmsteads (Cosmopoulos 2001:58).

The archaeological evidence indicates that in the 5th century B.C. people resided in small farmsteads around the town of Oropos and the valleys of its countryside. In the 4th century B.C. this settlement pattern subsequently expanded into more distant parts of the region. Cosmopoulos explained this situation with the second type dispersion of his model. He suggested that dispersed pattern of farmstead settlements starting from the 5th century B.C. and reached its acme during the late 4th century B.C. reflected a demand for increase in agricultural production. According to him exploitation of marginal land on hillsides by terracing, manuring, irrigation works, mixed cultivation of olive, vine, and cereals were the general strategies of agricultural intensification in the Classical Period. The survey results showed that the most visible practice of agricultural intensification in the Oropia was manuring. The halos of pottery scatters around the sites of Oropia, which confirms Bintliff's and Snodgrass' explanation of off-site scatters, indicate the intensive fertilizing with manure. Cosmopoulos explained the dispersion of rural settlements in Oropia in the 5th and the 4th century B.C. in terms of population increases and the political subordination to Athens and later to Thebes. Therefore, agricultural intensification of Oropia in the Classical Period could be best explained by the need to support an increasing population and the endeavour to satisfy the economic demands of the leading powers (Cosmopoulos 2001:74-76)

CHAPTER 5

DISCUSSION AND CONCLUSION

Traditional views on agricultural system and rural settlement patterns of Classical Greek world suggested primitive level of agricultural production and highly nucleated pattern of rural settlements. However, the results of archaeological field surveys much more stressed the role of intensive agriculture and settlement dispersion and showed that the quantity of individual farmsteads was dramatically increased in the Classical Period.

Most regions in Greece reflect the characteristic features of the Mediterranean climate. The main disadvantage of this type of climate for agriculture is summer drought that reduces the soil's amount of moisture. Besides, Greece is a mountainous country and except from some fertile valleys or inland plateaus most of the highlands were not much suitable for agriculture. Considering these negative effects of climate and geology early scholars argued that there was no considerable improvement in agricultural production of ancient Greek world. However, starting from the Archaic Period population increase was a characteristic feature of Classical Greece both in towns and country. Literary sources suggested that population density of Greece in the Classical Period was considerably high. Generally, in the survey projects conducted in the rural parts of Greece archaeologists try to test this trend of population in Classical Greek world (Whitley 2004:383). All of the case studies in Chapter 4 confirm that population increase was a

characteristic feature of the Classical Greece so that agricultural intensification was a necessity to satisfy the subsistence needs of increasing population. In this study I have suggested four indicators of agricultural intensification for Classical Greece: irrigation, terracing, manuring, and tower structures.

There is a close relationship between natural environment and agricultural system of a region. It may not be false to suggest that compared to the modern world in ancient times societies and their agricultural systems had been much more affected by the geographical and climatic conditions. Paleo-enviromental and paleo-geographical studies conducted in Greece showed that the big alterations of natural environment, which extensively affected the humanity, had taken place before the Classical Period. It can be said that both the possibilities and constraints of natural environment for Greek farmers in Classical Period were not so different than those of our time. However, since the 1950's there have been considerable changes in agricultural system of Greece. Modern opportunities such as mechanization and chemical fertilizers have considerably altered the structure of agricultural system. So, in order to understand the agricultural practices of Classical Greece and to make consistent inferences it is necessary to compare it with the countryside as it was before these alterations (Rackham 1996:20). Although this is not an easy task ethno-archaeological studies try to be included in majority of intensive survey projects today in order to understand the rural system of ancient Greek world.

The main aim of archaeological surveys is to interpret the factors that determined the occupation density of rural settlement and their patterns whether dispersed or nucleated (Whitley 2004:383). According to extensive agriculture is integrally related to the nucleated pattern of settlement; however dispersed pattern of settlement in farmsteads located near the

cultivable land might well be associated with more intensive agriculture. Extensive and intensive agriculture are characterized by different cultivation technologies, by different harvesting and crop processing technologies and so by different labour inputs and production outputs at almost every stage in the agricultural cycle (Halstead 1987:83). The intensive surveys carried out in Southern Argolid, Attica, Oropia, and Boeotia stressed the increasing number of small rural settlements and dispersion throughout the Classical Period. In all of these surveys majority of the small and dispersed type of rural settlements were interpreted as individual farmsteads.

Most scholars have agreed on the issue that the water management was an important subject in the ancient Greek poleis and it was among the chief interests of the rulers to provide fresh water supply for the citizens and to grant drainage systems for the cities. In terms of this water management system during the Classical Period Greeks had constructed drains, waste pipes and outlets in the poleis (Krasilnikoff 2002:50). However, looking at the lack of large rivers and the surface's inability to keep and accumulate water, early interpretations on ancient agriculture suggested that there was a very limited role of irrigation in the rural part of the Classical Greece. On the other hand, recent archaeological investigations and comparative studies of later agricultural processes have shown that irrigation was more widespread practice in ancient Greek agriculture than previously thought (Horden and Purcell 2000: 244-247). Furthermore, from some ancient texts as mentioned in Chapter 3 it is possible to find the impressions of irrigation practices in the Classical Greek world. Lohmann (1992:51) stated that in the vicinity of the actual farmsteads, retaining basins and dams are recognizable. These basins and dams controlled one of the typical features of the Mediterranean climate, the destructive forces of the heavy rainfalls. For controlling the destructive force of winter rains, Classical period's people built retaining basins and dams.

In the Classical Period by terracing the steep slopes and hillsides, which were regarded as non-productive and marginal lands, Greek farmers made them available especially for olive and vine cultivation. Conversely, Foxhall (1996:44-45) claimed that there is no satisfactory description or reference of terracing in ancient literary sources and terraces detected in archaeological surveys and dated to Classical Period possibly continued to be used in later periods. So she came to the conclusion that identifying ancient terracing is impossible in the Greek countryside. In Chapter 3 I have summarized Price and Nixon's criteria for dating existing terraces in the ancient landscapes of rural Greece. Instead of Foxhall's pessimistic view on dating the terrace structures of Classical Period, the approach of Price and Nixon seems more reasonable solution for the dating problems of ancient terraces.

Additionally, various archaeological surveys conducted in the rural parts of Greece presented the concomitant existence of classical farmsteads with agricultural terraces. Lohmann (1992:42) stated that there have been identified agricultural terraces together with threshing floors and some fragments of olive pressing equipments in two large Classical farmsteads in Palai Kopraisia. He considered these archaeological evidence as the indicators of agricultural intensification.

The standard model for ancient Greek agriculture offered nucleated residence at a distance from fields, regular fallowing, and seasonal transhumant pastoralism. In this extensive agricultural system arable farming and stock husbandry were primarily separated from each other. Therefore, in such a system of agriculture the role of manuring could be so limited. However, intensive survey projects conducted throughout the Aegean region suggest a new model of agriculture for Classical Period in which there are

intensive agriculture and a close relationship between farming and husbandry. In this intensive system of agriculture rather than biennial fallow there was rotation of crops that produced silage crops for stock animals so it could be possible to keep them close to the farm lands and to produce fertilizing manure (Shanks 1997:165-166).

As mentioned in the Chapter 3 and 4, Bintliff and Snodgrass (1988:508) interpreted the low density of off-site artefactual scatters as an indicator of ancient manuring practices. They stated that ancient Greeks systematically collected organic wastes and mixed them with pottery sherds to be used as fertilizing manure. According to Pettegrew (2001:196-199) the classical rural households in the Aegean had not firmly settled. Ancient rural inhabitants had usually abandoned their settlements so the classical habitation structures in rural Aegean were portable in character. There were various reasons to change the settlement. For example, new opportunities or new resources could direct the inhabitants to move or some conflicts and insecurities forced them to abandon their settlements. Moreover, there could be some factors related to the agrarian system itself. For instance, tenant-farming system had forced people to move or abandon their settlements when the property changed owners. Inhabitants could carry out the physical objects and building materials of the rural structures when they decided to change or move their settlements. Pettegrew suggested that these cultural formation processes could also lead low-density scatters of pottery and this may represent a signature of habitation rather than agricultural practice of manuring.

Although there are controversial arguments on the process of off-site artefact scatters, when we look at the results of archaeological excavations and surveys the “manuring hypothesis” of Bintliff’s and Snodgrass’ seems to be

valid at least for the Classical Period. Excavations of Classical houses at Halieis showed that in House A, B, and 7 there are some stone-lined pits, which were identified as *koprones*. This interpretation reinforces the idea that in Classical times manure was also collecting in the towns in order to spread on the agricultural fields (Bradley 1999: 550-553). The results of Boeotia survey showed that the density of off-site artefacts around the rural settlements nearest the Thespiae city was higher. According to Bintliff the reason of this high-density scatters was urban-derived manure and he attributed the higher quantity of Classical sherds in the scatters to the agricultural intensification of this period (Bintliff 2005: 137-141).

The function of the towers has been a subject of discussion. While some scholars stress the military function of towers, some of them emphasize their agricultural purpose. As mentioned in Chapter 4 Lohmann (1992:39-40) suggested that the function of towers could be identified by analyzing their architectural features. By their sophisticated fortifications, greater wall thickness, elevated entrances and locations on the hill tops military purposed towers could be distinguished from the farmstead towers. Increased dispersal of artefacts and structures in the Classical Period of Greece could be interpreted as denser occupations of the countryside with farm residence or intensive exploitation of the landscape by improved techniques of agriculture (irrigation, terracing and manuring). Towers can be considered as one of the important indicator of this agricultural intensification rather than mere signs of prestige and prosperity demonstrated by wealthier landowners (Morris and Papadopoulos 2005:164).

The forms of agricultural labour in the Classical Period had determined by environmental, socio-economic, and historical factors. However, it can be possible to detect basically two types of agricultural labour in Classical Greek

word. In large areas, land was cultivated extensively by serfs who produced mainly grain to support themselves and an elite population. They had right to continue cultivating the land but they had almost no privileges in the society. On the contrary, in the private farmsteads in which there was mixed and specialized agricultural production, slaves were used as a labour force and there was generally a market-oriented production (Jameson 1992: 135-136). The size of dispersed rural settlements of Classical Period detected in archaeological surveys was generally small. As our case studies showed that these small-sized rural settlements were commonly identified as individual farmsteads in which there was a mixed and intensive types of agricultural production. However, it can be possible to distinguish the signs of bigger farm estates like that of Attica. In these bigger rural settlements the indicators of agricultural intensification such as well build terraces and towers could be identified more clearly.

In this study I have tried to show the relationship between agriculture and rural settlements of Classical Greece. To do this I have used both historical and archaeological sources. As mentioned in the beginning of this study there could be various determinants of the rural settlement patterns of the ancient societies. In the case of Classical Greece, when we consider the increasing size of population and the demands of non-agricultural sectors of the society agricultural intensification seems as an unavoidable process. In order to increase agricultural productivity Greek farmers of Classical Period exploited marginal lands by irrigation and terracing. They also improved techniques of agriculture by crop rotation and intensive manuring. Archaeological surveys showed that the signs of these agricultural improvements were much more recognizable in the individual farmsteads rather than the nucleated villages or hamlets.

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APPENDICES

APPENDIX A:TABLES

Life cycle	*Cereals*		*Pulse/ vegetables*		*Oil/ wine*	
	(kcals)	(ha)	(kcals)	(ha)	(kcals)	(ha)
0	2,354,250	1.32	1,177,125	1.89	392,375	0.15
3	2,586,390	0.44	1,293,195	2.08	431,065	0.10
6	1,914,060	1.06	957,030	1.54	319,010	0.13
9	2,417,760	1.35	1,208,880	1.94	402,960	0.16
12	2,689,320	1.50	1,344,660	2.16	448,220	0.18
15	2,888,610	1.61	1,444,350	2.32	481,435	0.19
18	2,229,420	1.17	1,114,710	1.79	371,570	0.15
21	1,773,900	0.98	886,950	1.42	295,650	0.06
24	1,154,130	0.64	577,065	0.93	144,500	0.04

Table 1: Dietary and land-holding needs over the life cycle (Gallant 1991:73)

	Water requirements			
Population	at 25 kg per person per day	at 30 kg per person per day	at 44.61 kg per person per day	Available*
1,000	9,125,000	10,950,000	16,282,650	4,991,382
2,000	18,250,000	21,900,000	32,565,300	9,982,764
3,000	27,375,000	32,850,000	48,847,950	14,974,146
4,000	36,500,000	43,800,000	65,130,600	19,965,528
5,000	45,625,000	54,750,000	81,413,250	24,956,910
6,000	54,750,000	65,700,000	97,695,900	29,948,292

*Assuming 5 people per house and that each house has an area of 56 sq m

Table 2: Water requirements and availability in Melos (Wagstaff and Gamble 1982:101)

HABITATIONS

Towns

Large size (5.0 ha or more), fortification walls, religious sanctuaries, cemeteries, evidence of a built-up area of habitations within the walls, and the probable identification by historical reference with a known place. *Examples*: Halieis (A65), Hermion (E19).

Habitations

Villages, hamlets, and those habitations we cannot classify with assurance. Some individual farmsteads, where there are many outbuildings or the length or number of occupations was great, are probably included in this category. Assumed to be 1.0 ha to 5.0 ha in size; architectural remains from more than one structure, and a comprehensive cross section of artifacts that we take to be "domestic" in character (e.g., roof tiles, storage vessels, fine ware, stone tools, etc.). *Examples*: Fournoi Focus (e.g., F32), Petrothalassa (E6), Panayitsa (B4).

Farmsteads

Dwellings assumed to be inhabited for some part of the year by some members of a household. Consistently smaller than other categories of presumed settlements (often less than 2.0 ha in size), sometimes with evidence of a rectangular structure or a tower, roof tiles, a full range of "domestic" artifacts (including, in the Classical period, lamps, oil press beds or weights, loom weights, coins, other metal objects), and other habitational features such as storage pits or cisterns. *Examples*: Yializa #10 (B89), Lambayana tower (F3).

Field buildings (i.e., seasonal houses, storerooms, animal folds, etc.)

Similar to farmsteads in some respects, though perhaps smaller in size. Architectural remains may be present, but it is assumed that the assemblage of artifacts will contain a smaller range of "domestic" types than those of the other categories of settlements. *Examples*: Fournoi valley #6 (F45), Fournoi valley #9 (F49).

Fortifications

A large free-standing surrounding wall of rubble or cut blocks that does not contain a large inhabited area of dwellings. *Examples*: Profitis Ilias #1 (peak) (B21), Bladelet Hill (F12).

SPECIAL-PURPOSE SITES

Graves, cemeteries

Chamber tombs, cist graves, or clusters of rectangular cuttings in bedrock. Also an extremely small site with pottery known from excavated cemeteries to be funerary in character. *Examples*: Halieis necropolis (A21), Kranidhi roadside (B17).

Quarries

Stepped cuttings in bedrock faces without associated scatters of cultural materials evidently for the removal of rectangular stones. *Example*: Portes quarries (F59).

Inscriptions

Letters cut into bedrock or standing stones. *Example*: *Horos* inscription (E15).

Wells

In the absence of visible shafts, detected by stone or terra-cotta puteals (wellheads). *Example*: Fournoi well (F27).

Shrines, sanctuaries, memorials

Variable in size, but identified where architectural remains are found of small structures with high-quality cut stone blocks used in construction. The presence of artifacts similar to those associated with religious structures that have been excavated: figurines (of gods, animals, or votaries), miniature vessels, *kernoi*, and stone sculptures. In the Classical period there may be a high incidence of red-figured pottery sherds; inscriptional evidence, such as graffiti on sherds, may be expected in both the Greek and Roman periods. *Examples*: Temple Terrace (C17), Stavros (A5).

Lithic scatters

Scatters of flint and obsidian flaked artifacts found with little or no associated pottery, architectural remains, or other cultural features. *Examples*: Waste-flake ridge (B29), Fournoi valley #10 (F51).

Pottery kilns

Identified by the presence of wasters, vitrified clay, large quantities of broken but unused pottery, and the structural remains of kilns. *Examples*: Khinitsa Island (A17), Kounoupi (B19).

Other

A deposit attributed to a single event of uncertain character, or the remains of a structure or feature not otherwise classified. *Examples*: Metokhi (A23), "Turkish" windmill (B14).

Table 3: Categories of Southern Argolid archaeological site functions (Jameson *et al.* 1994:249)

Period	Town	Habitation	Farm	Shrine	Fort	Grave	Quarry	Well	Lithics	Kiln	Inscrip-tion	Other
MP–UP									4			
EH		35 (9)				1			1 (7)			4 (3)
MH		5				(1)						2
LH		26 (7)			1 (1)							2 (1)
PG–A	3	9 (5)	7 (9)	6 (2)	2	3 (2)		(1)				3 (4)
C	4	9 (3)	13 (9)	5 (4)	2	5	(2)	2				6 (1)
C-H	4	9 (9)	64 (23)	2 (2)	(1)	1 (1)	(1)	1 (1)			(1)	6 (4)
H–MR	1 (2)	3 (11)	16 (25)	2		1						1 (2)
LR	1	29 (9)	27 (29)	3 (3)		(1)	(3)	1 (1)		1 (3)		9 (3)
Med	(2)	15 (2)	18 (8)	6 (3)	2							5 (2)
Uncertain							3		11			

Table 4: Site functions in the Southern Argolid, by Archaeological Period (Jameson *et al.* 1994:251)

Period	N	Small	Medium	Large	Maior
EBA	25	13	10	2	
MBA	4	3		1	
LBA	18	13	3	2	
PG–LG/SG	14	9	5		
A–C	38	28	5	3	2
C-H	75	56	14	3	2
H–MR	23	16	4	2	1
LR	53	31	12	9	1
Med	41	27	7	7	

Table 5: Site sizes in the Southern Argolid, by Archaeological Period (Jameson *et al.* 1994:253)

Site	Date	Press beds	Weight blocks
B103	C-H		1
E30	C-H		1
A61	C-H	1	
B78	C-H	1	1
E38	(C-H), H	2	1
E54	C-H	1	
G14	(C-H)	1	1
A60	C-H	1	
E52	(C-H), (H)		1
G54	(C-H)?	1	
A65	C-H	6	4
E81	Med (reused)		1
B6	Greek?	1	
E7	(A), C, C-H, (LR)		1
E50	(LR), Med (reused)		1
E70	(C-H), (H), LR, (Med)		2
C11	LG/SG, A, C, C-H, (H), LR	1	
G1	LG/SG, A, C, Med		1
E26	LR	1	1
A8	LR	1	
TOTAL		18	17

Table 6: Olive-oil pressing equipment found in the Southern Argolid (Jameson *et al.* 1994:358)

Function:	Location/natural resources	Size	Architecture	Pottery	Stone	Other
Habitation Village-hamlet	Combination of arable lands, pasture fields, trade routes, strategic location	Large-Medium	Extensive; possible fortification walls	Large quantity and wide range of types (serving, storage, consumption, miscellanea)	Large quantity and wide range of types	Tiles, bricks, possibly metal artifacts
Farmstead -incl. auxil. structures (storage facilities, animal folds, cisterns, etc.)	Proximity to arable land and/or pasture fields	Small	Limited, if any	Fine domestic and coarse	Limited quantity and types	Tiles and bricks
Cult place (shrine, sanctuary)	Summits, caves, open areas	Small	Limited, if any	Ritual vases	Figurines	Figurines
Burial place (grave, tomb, cemetery)	Any location	Small	Possibly	Burial vases	Figurines	Figurines
Industrial site (ceramic or metallurgical kilns, etc.)	Open area	Small	Possibly	Discarded broken sherds, wasters	Moulds, tools	Tools

Table 7: Classification and attributes of site function in the Oropos Survey Project (Cosmopoulos 2001:24)

APPENDIX B: FIGURES

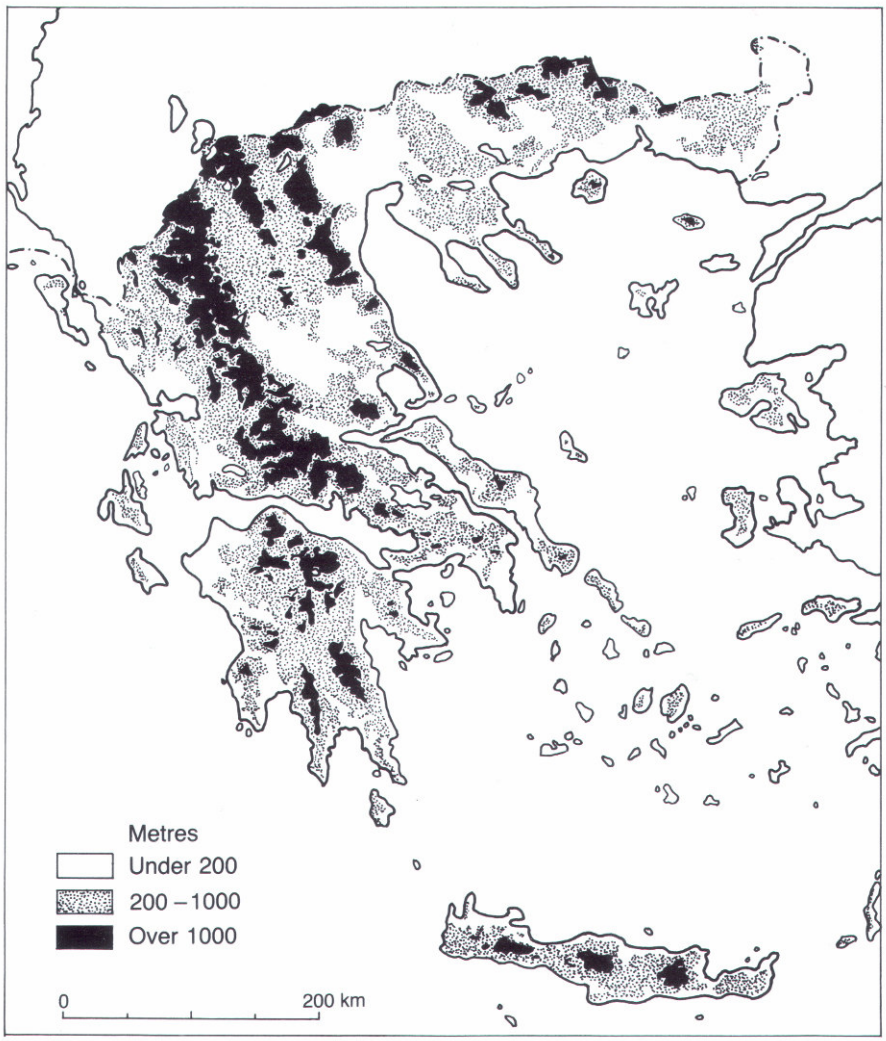

Figure 1: Orographic map of Greece (Isager and Skydsgaad 1995:12)

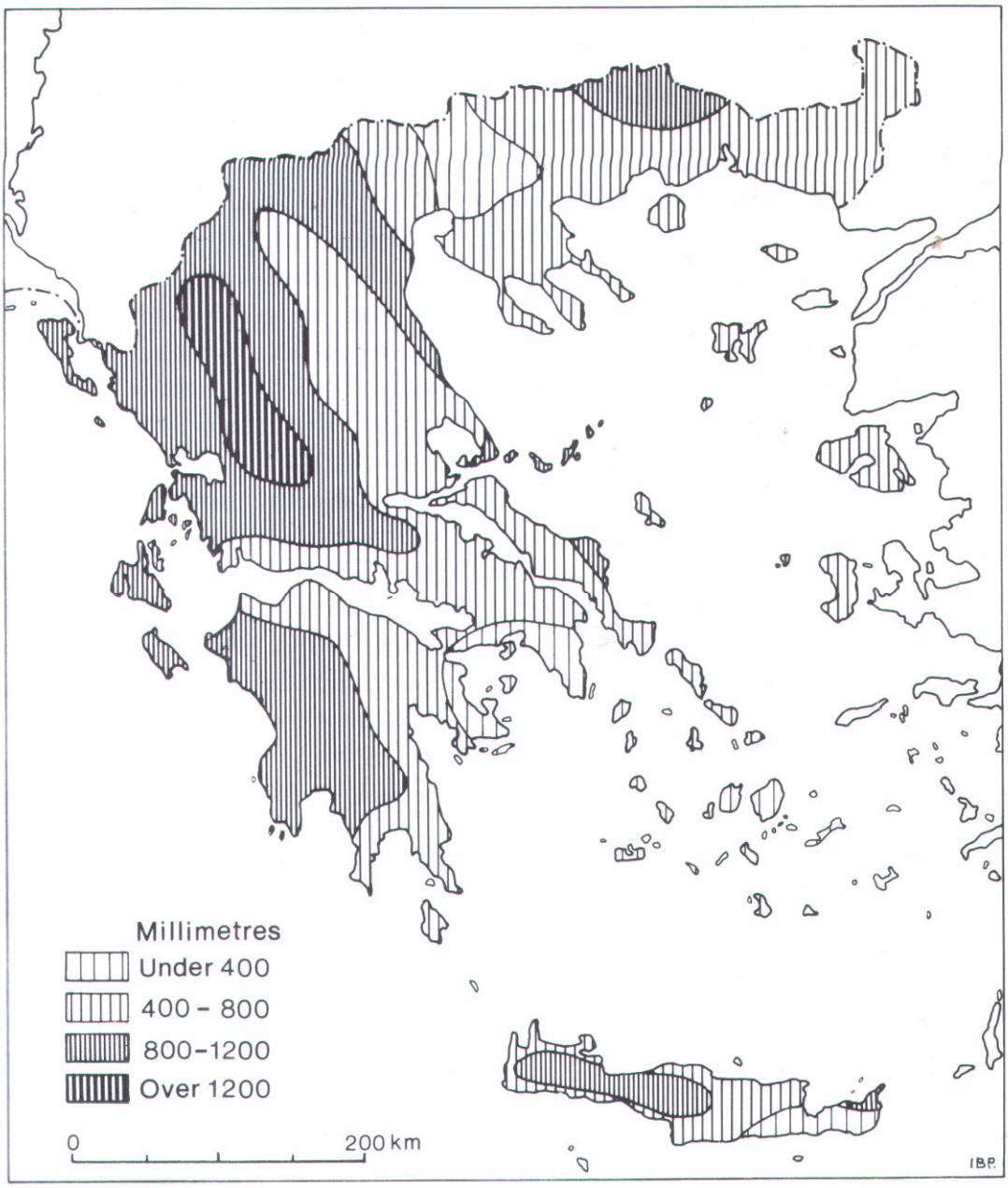

Figure 2: Hydrographic map of Greece (Isager and Skydsgaad 1995:13)

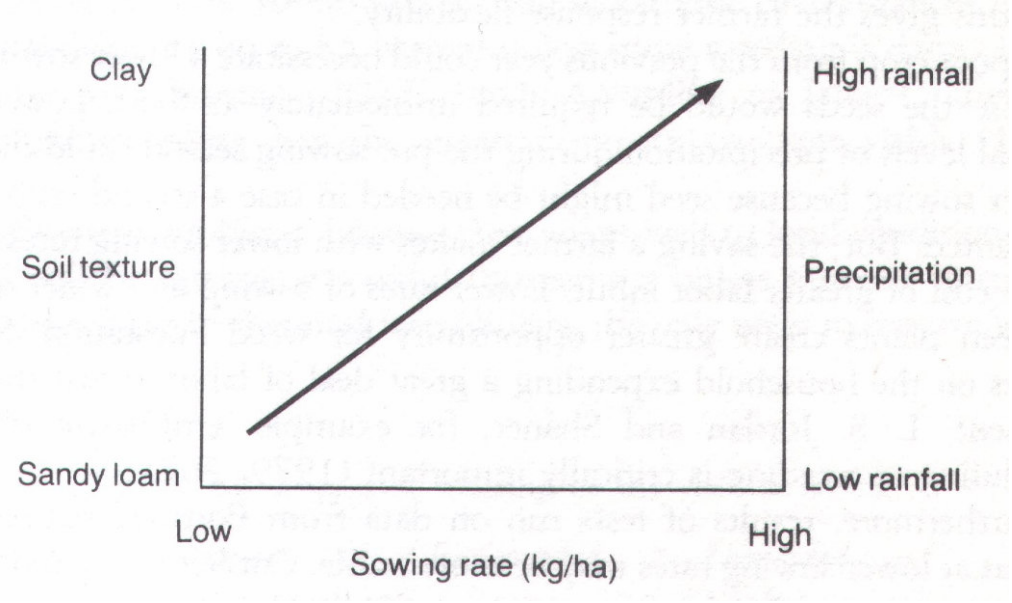

Figure 3: Relationship between soil texture, precipitation, and sowing rates (Gallant 1991:47)

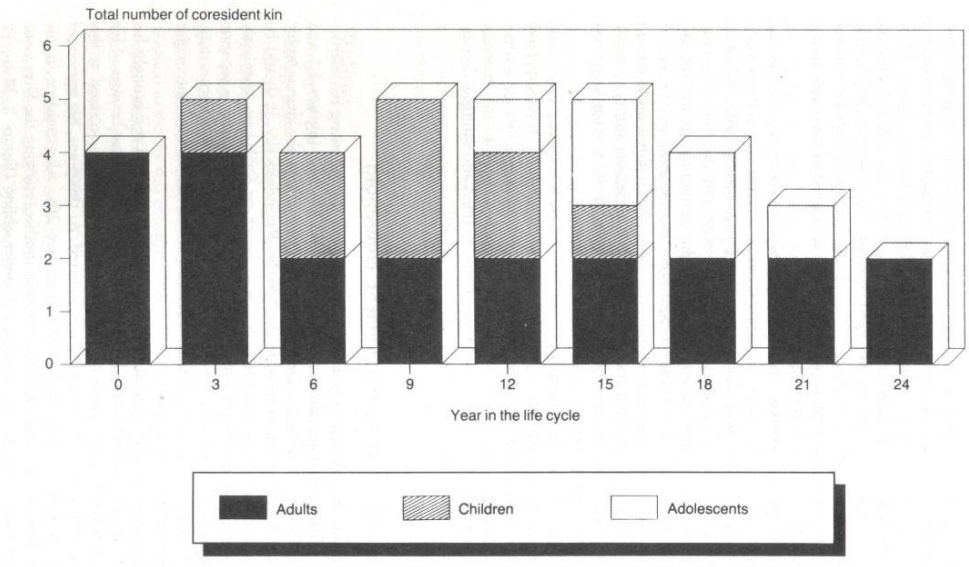

Figure 4: Model of ancient household life cycle (Gallant 1991:28)

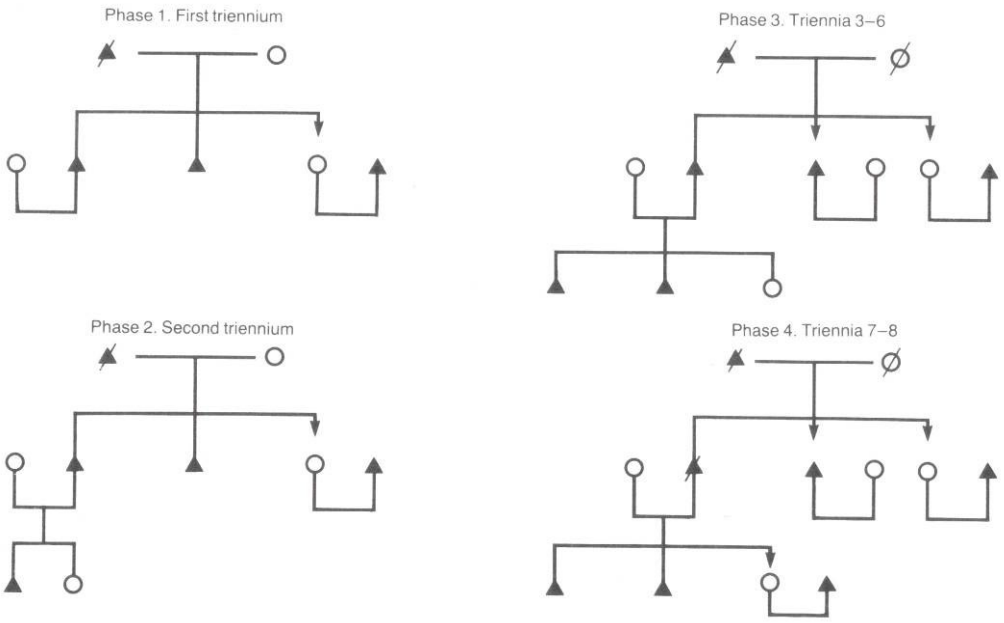

Figure 5: Hypothetical household life cycle (Gallant 1991:29)

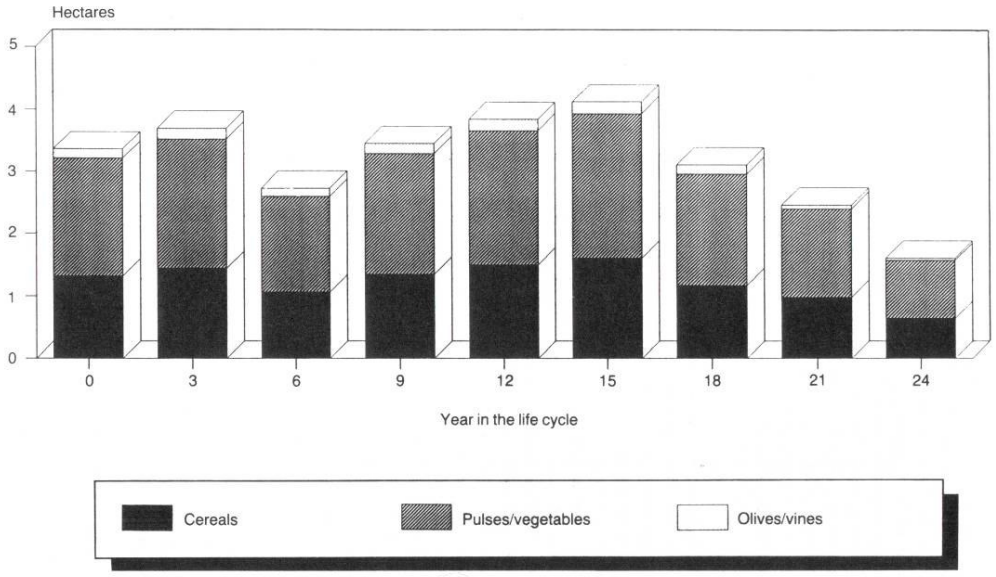

Figure 6: Land required to produce subsistence minimum (Gallant 1993:83)

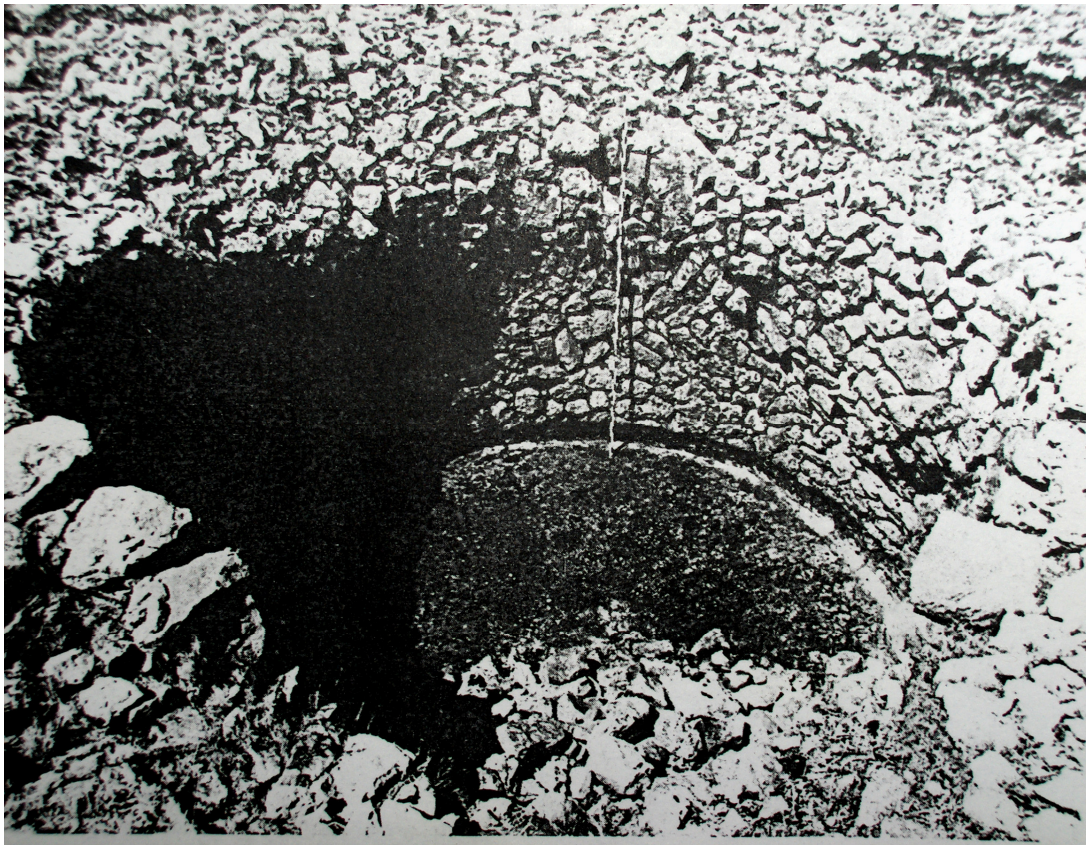

Figure 7: Ancient water-basin at Kambouri, Chios (Lambrinoudakis 1986:299)

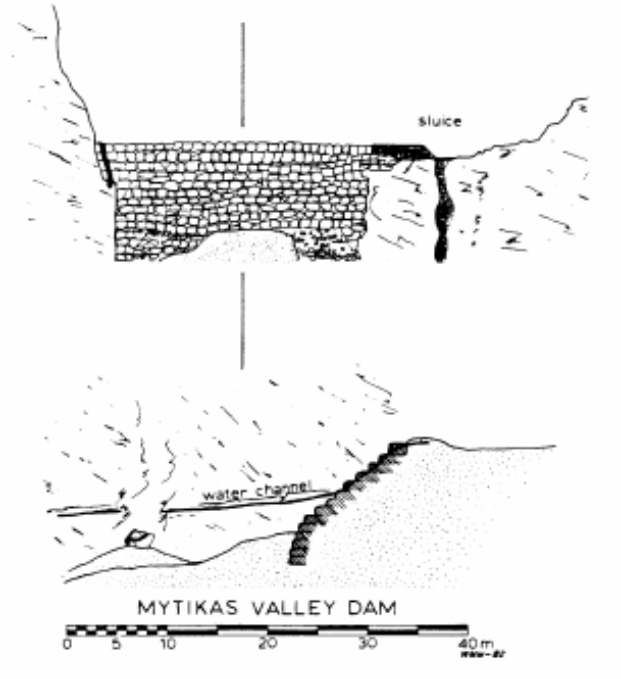

Figure 8: Mytikas Valley Dam, frontal and sectional views (Murray 1984:198)

Figure 9: Mytikas Valley Dam from East (Murray 1984: Plate 32)

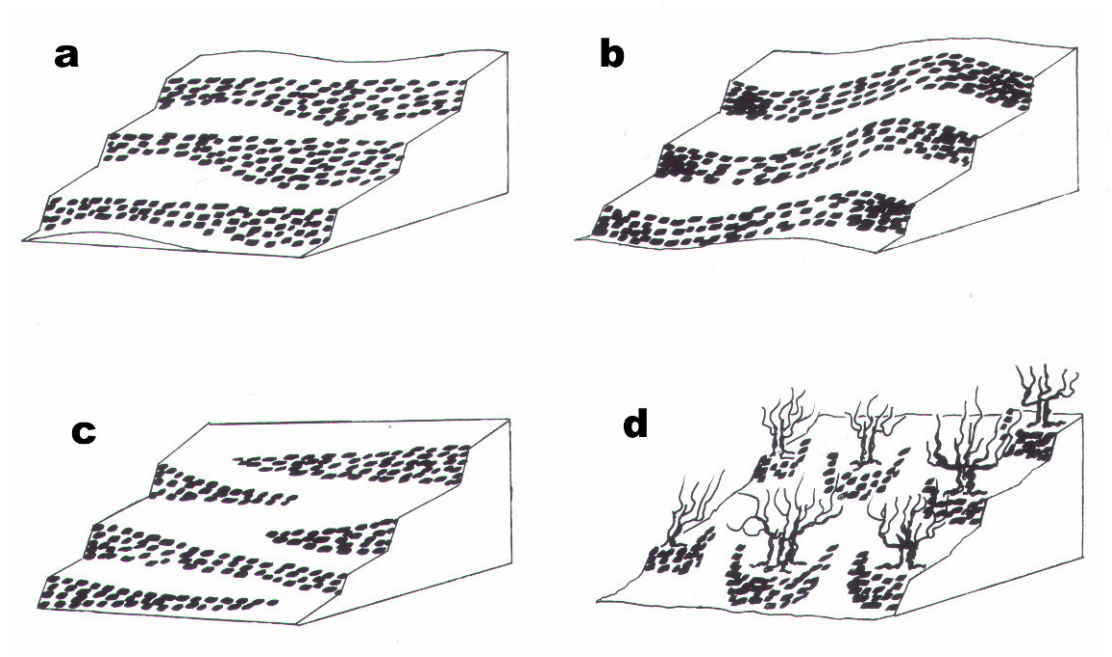

Figure 10: The three types of terraces, stepped (a,b), braided (c), pocket (d) (Rackham and Moody 1992:124)

Figure 11: Step-terraces surrounded by an enclosure wall in Amorgos Island, Greece (Rackham and Moody 1992:127)

Figure 12: Braided terraces in use for barley, Livaniana, Crete (Rackham and Moody 1992:126)

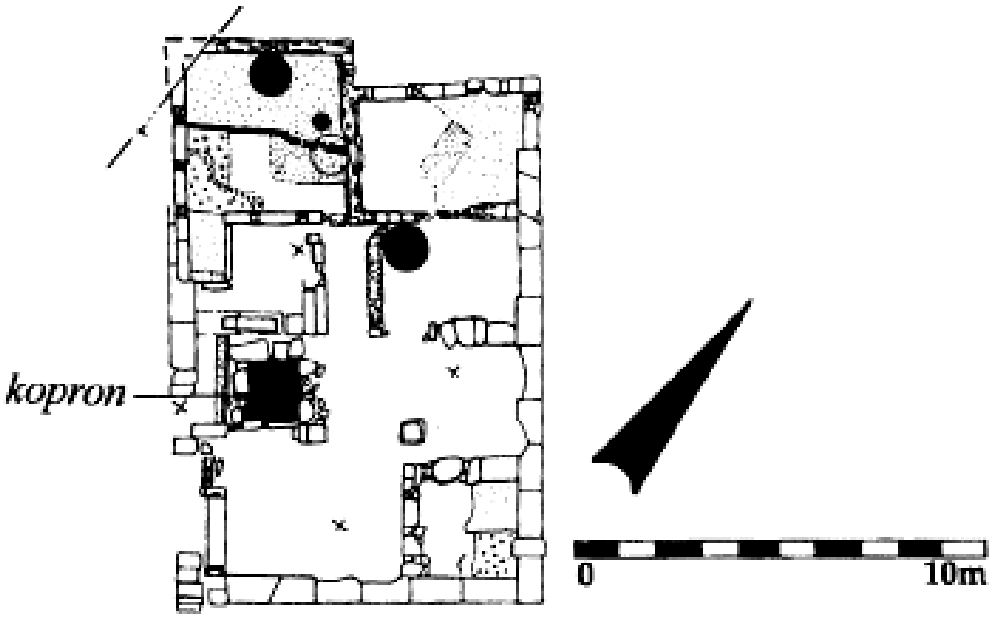

Figure 13: Plan of House A, Halieis (Bradley 1999:551)

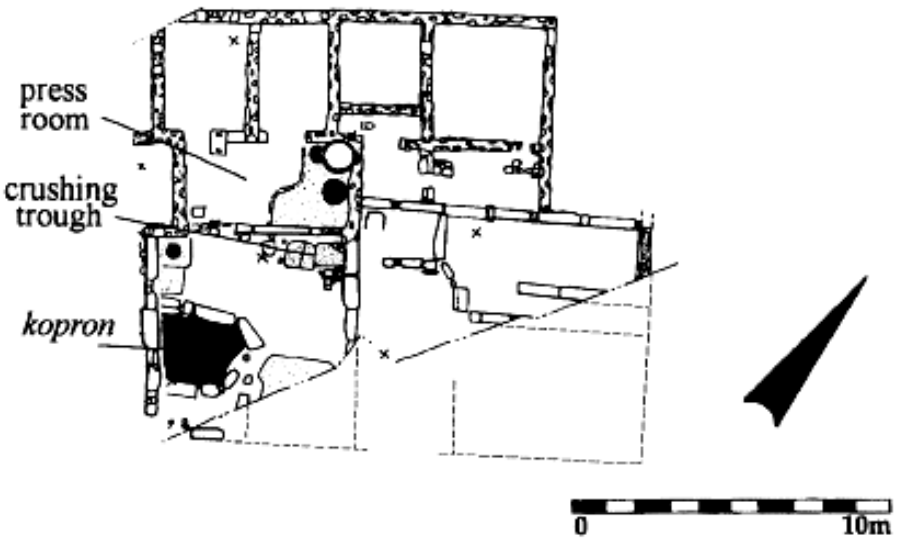

Figure 14: Plan of House D, Halieis (Bradley 1999:551)

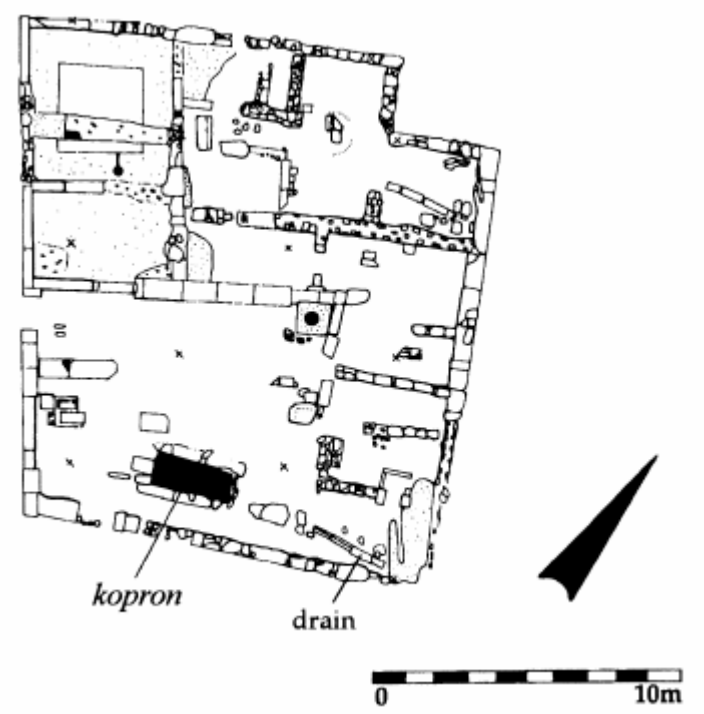

Figure 15: Plan of House 7, Halieis (Bradley 1999:554).

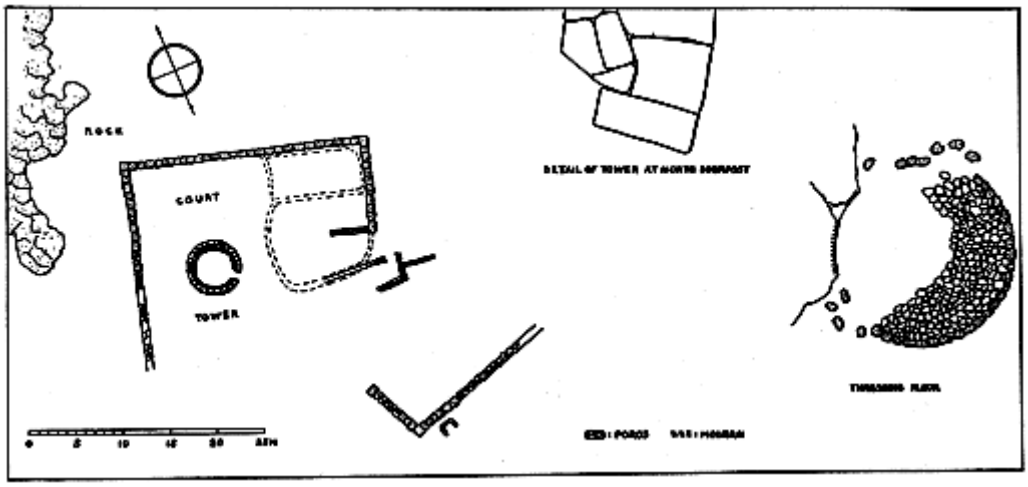

Figure 16: The Princess Tower, Sounion (Young 1956:123)

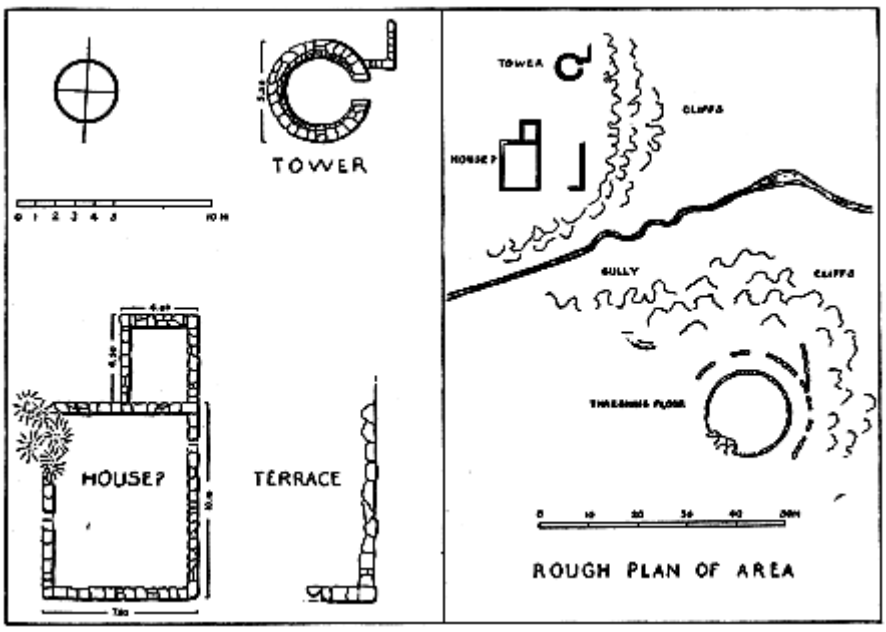

Figure 17: The Cliff Tower, Sounion (Young 1956:125)

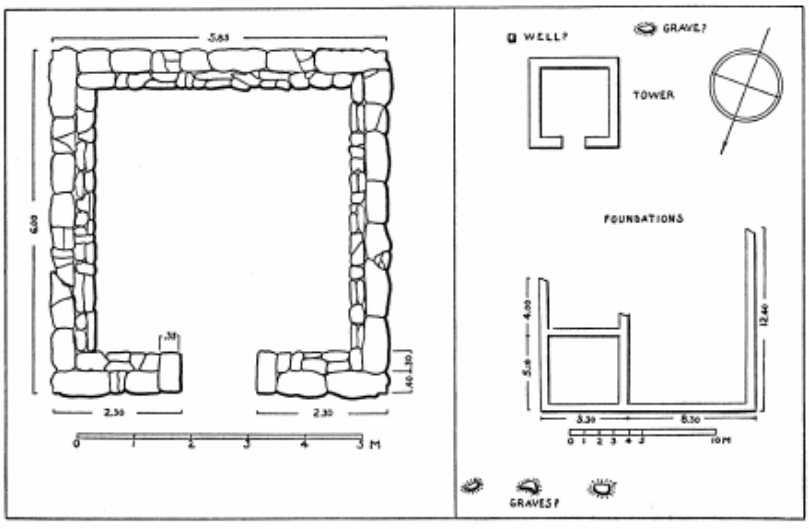

Figure 18: The Golden Pig Tower, Sounion (Young 1956:127)

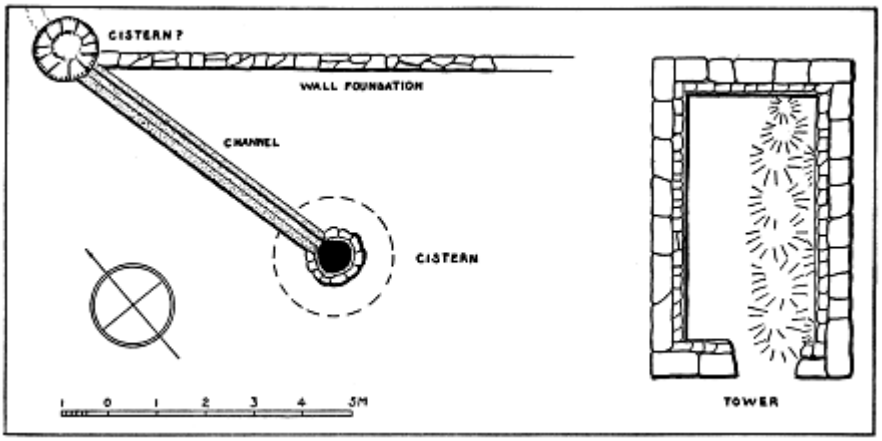

Figure 19: The Yellow Tower, Sounion (Young 1956:127).

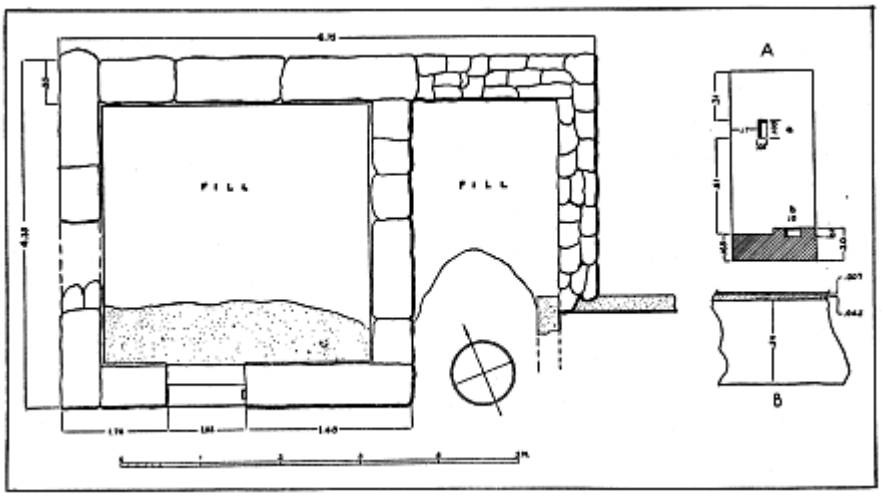

Figure 20: The Red Tower, Sounion (Young 1956:129).

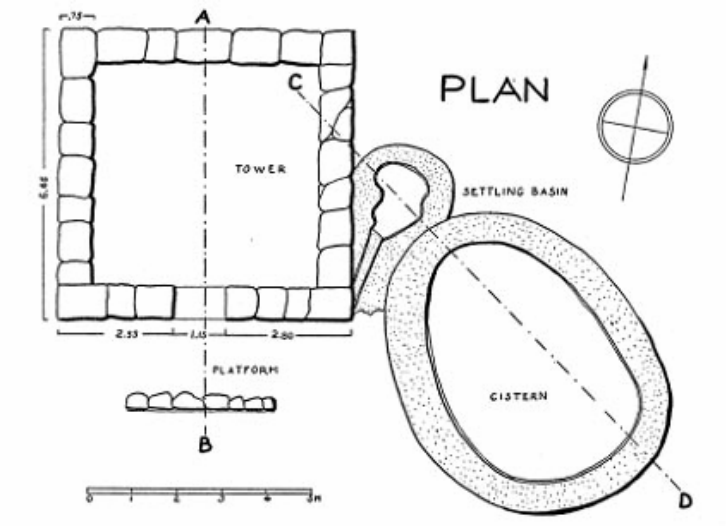

Figure 21: The Hilltop Tower Sounion (Young 1956:130)

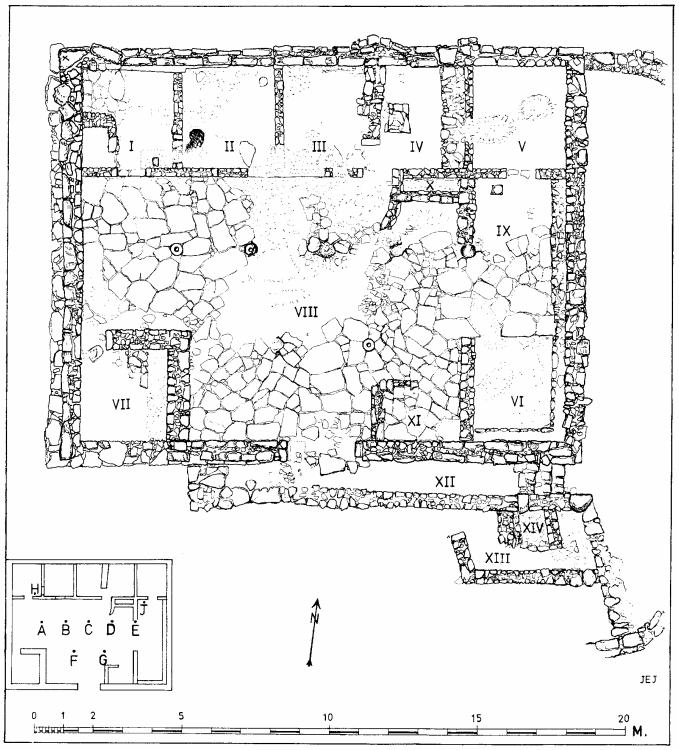

Figure 22: Plan of the Vari House (Jones *et al.* 1973)

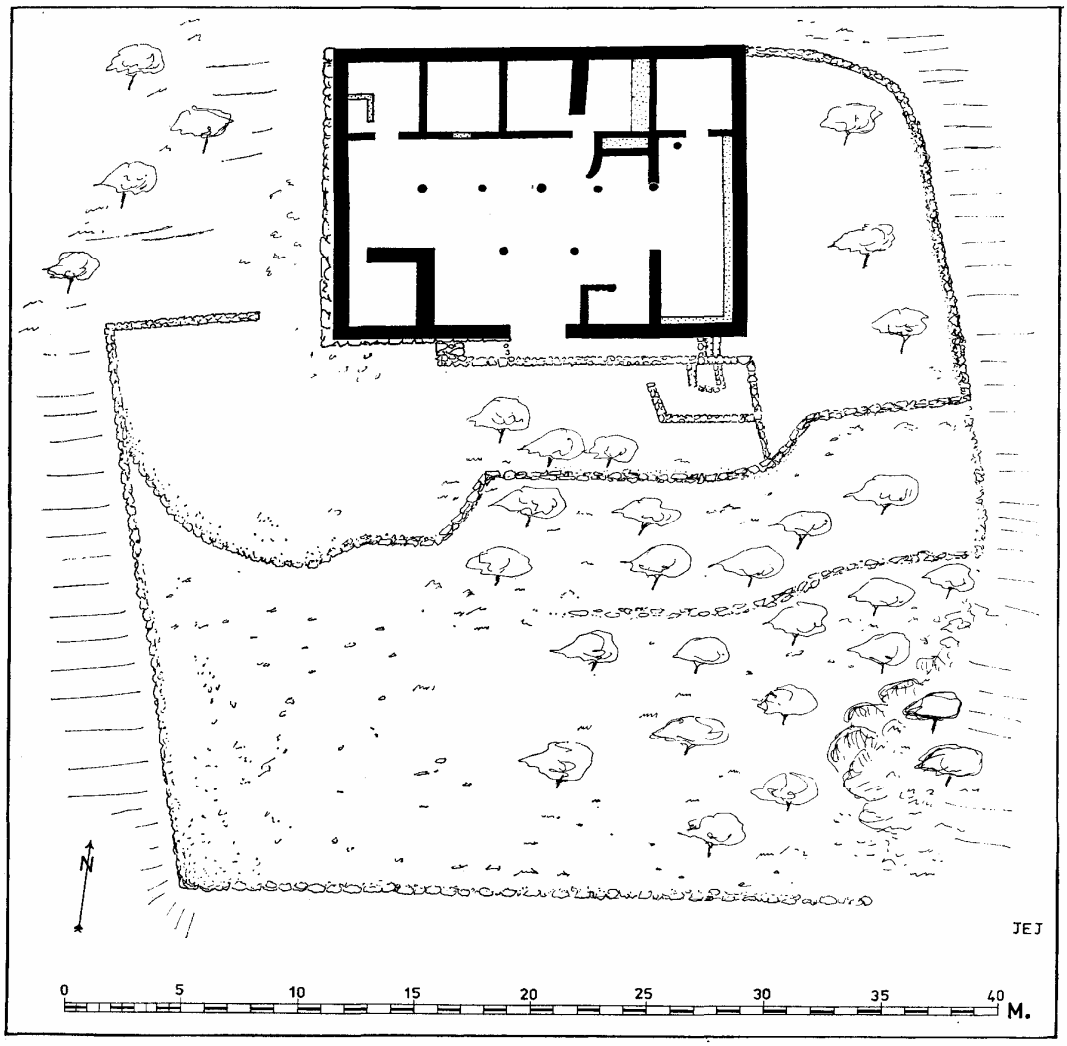

Figure 23: Plan of the Vari House with its enclosure (Jones *et al.* 1973)

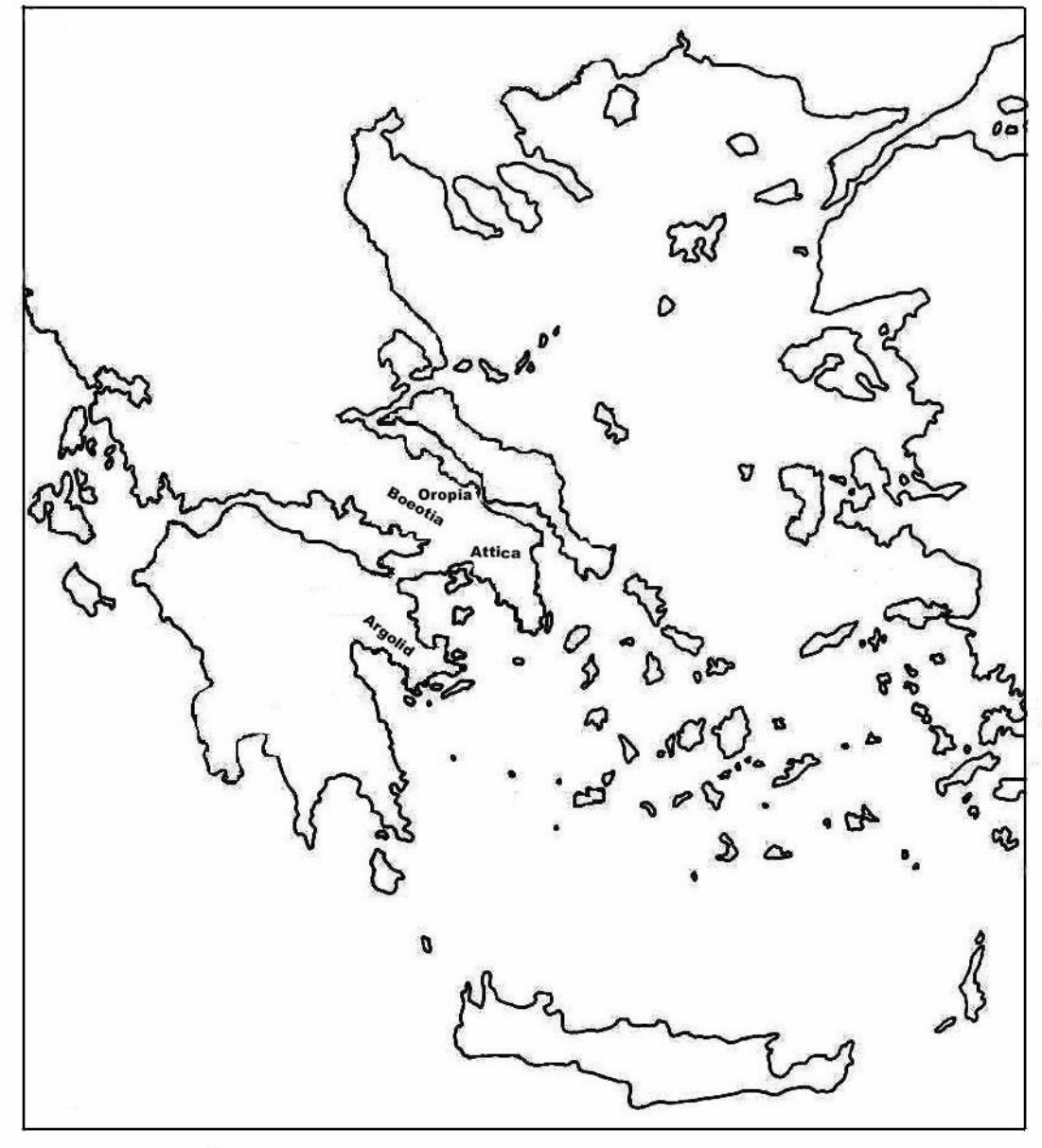

Figure 24: Map of Greece showing the regions of archaeological surveys mentioned in Chapter 4

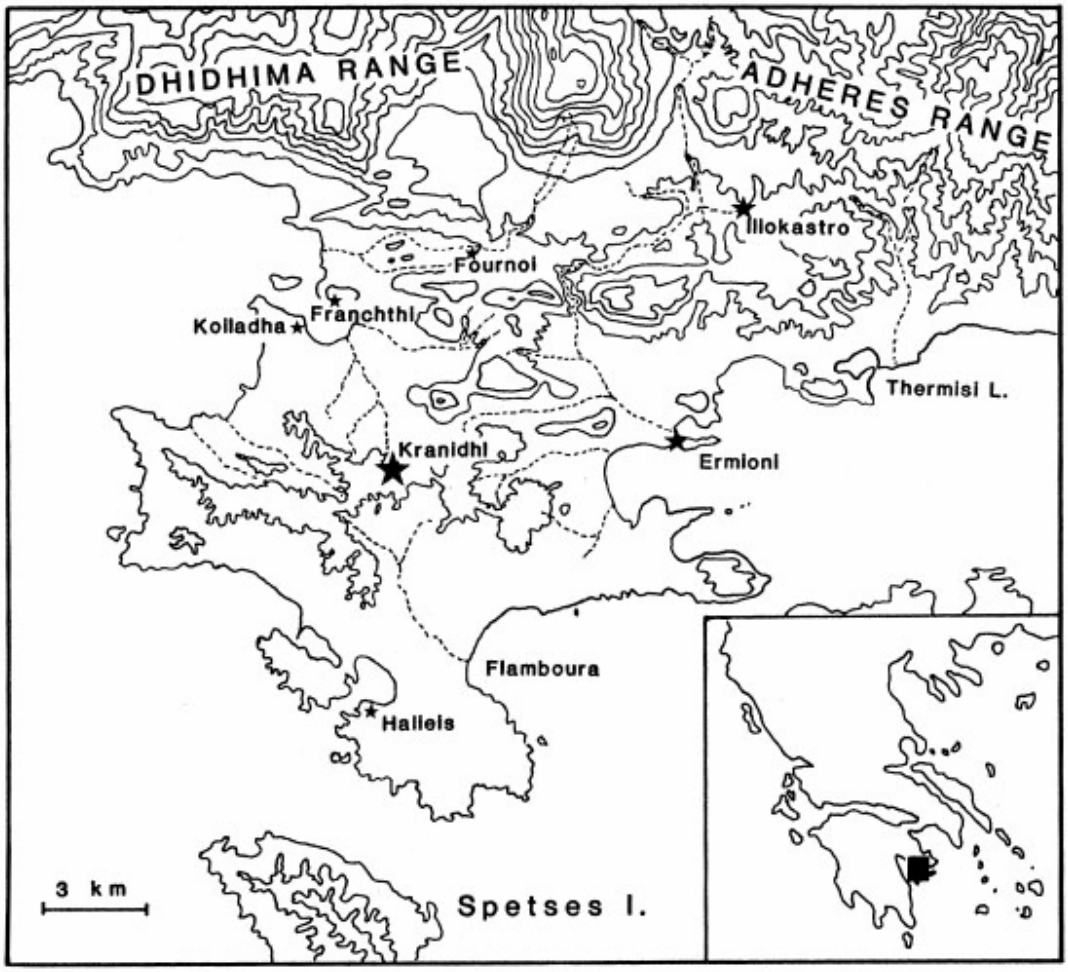

Figure 25: Map of Southern Argolid showing the study area of the Stanford University Archaeological and Environmental Survey (Runnels and van Andel 1987:304)

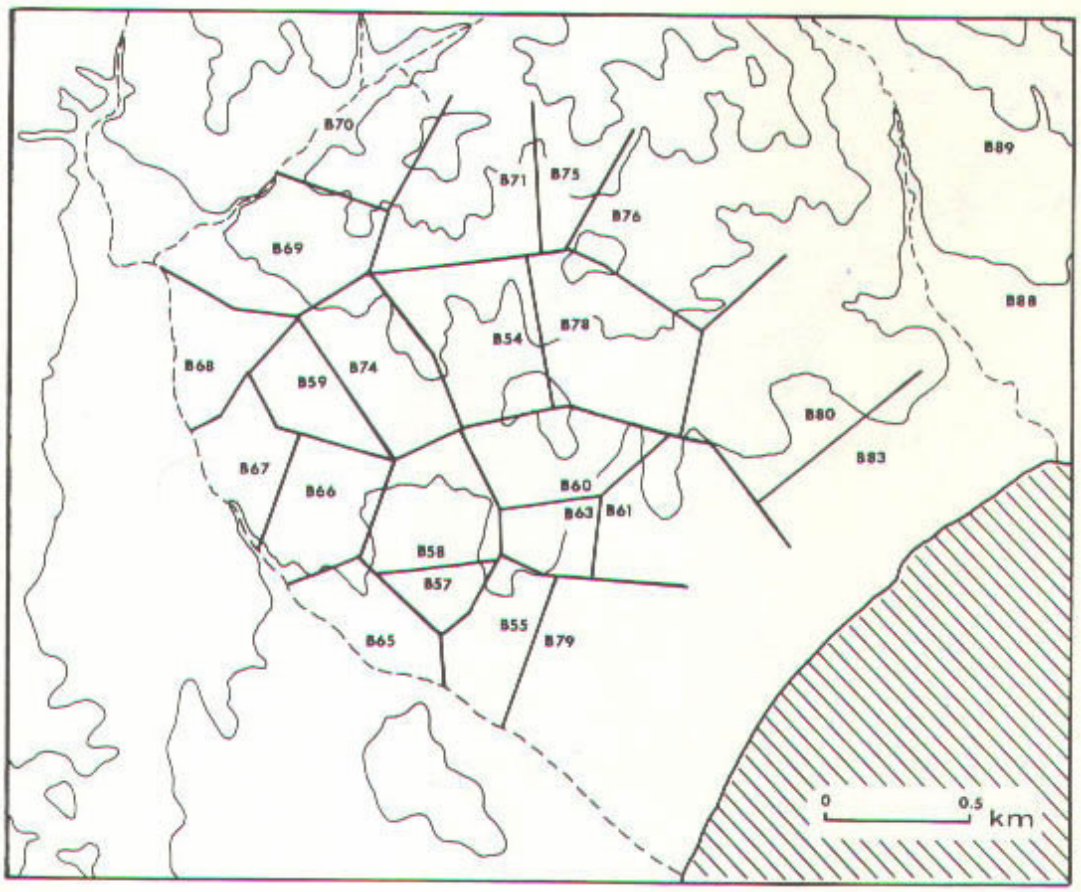

Figure 26: Farm sites at Flamboura, Southern Argolid, and possible land divisions (Runnels and van Andel 1987:388)

Figure 27: Map of South Attica (Lohmann 1992:31)

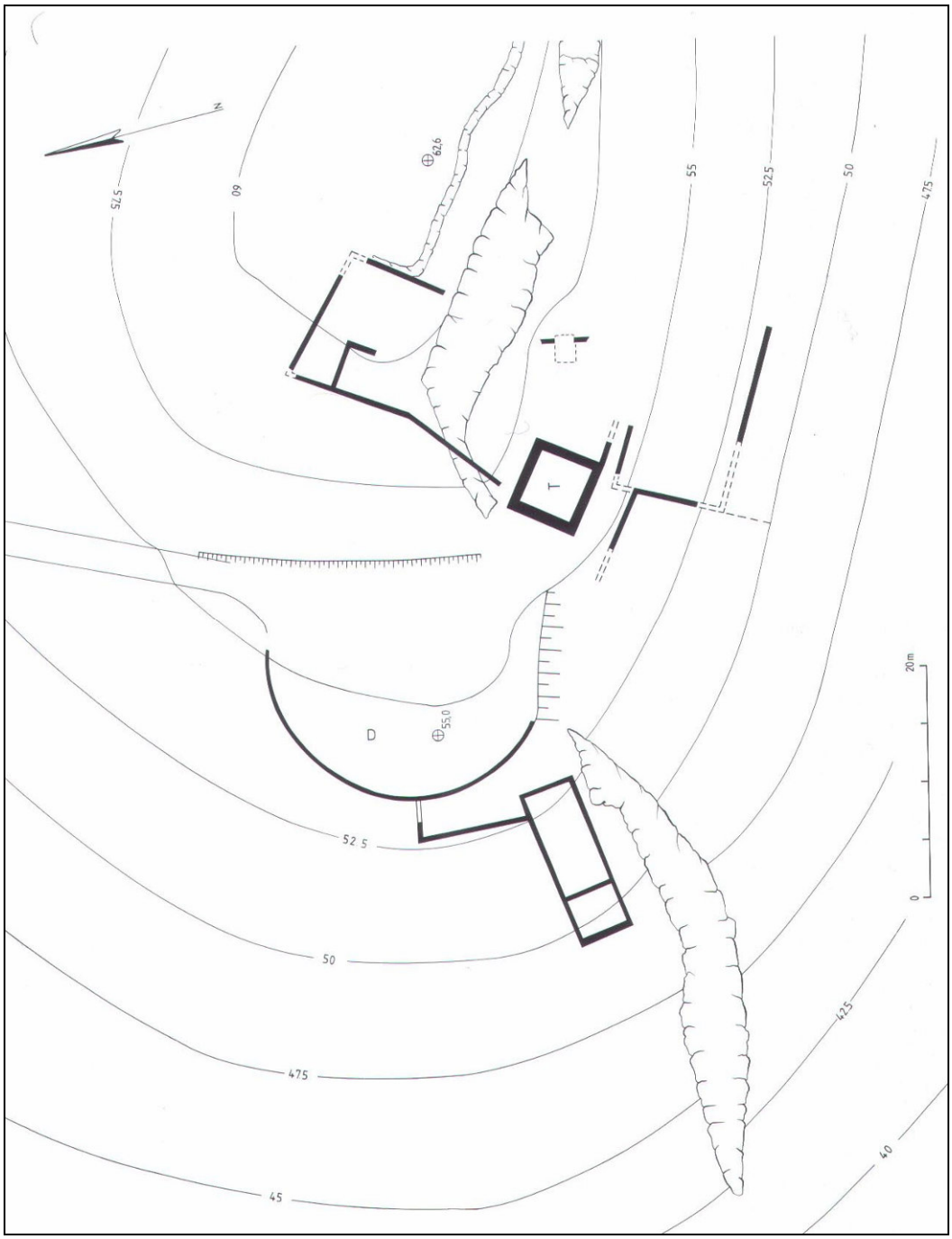

Figure 28: Classical farm estate with tower, threshing floor and outer buildings at Thimare, Attica (Lohmann 1992:41)

Figure 29: Classical farmhouse tower in the valley of Megalo Vathychori, Attica (Lohmann 1992:42)

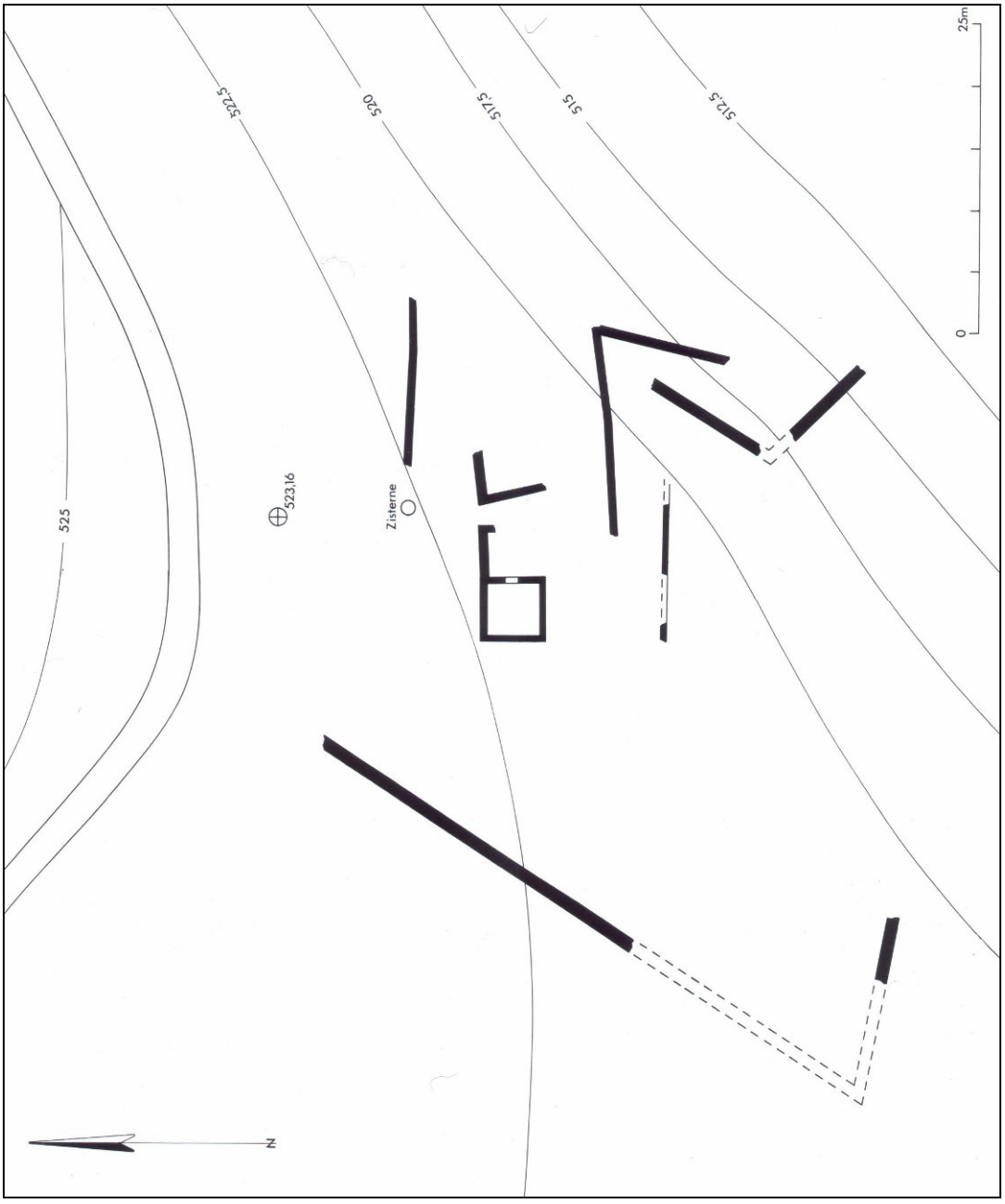

Figure 30: Classical farm estate in the valley of Megalo Vathychori, Attica (Lohmann 1992:43)

Figure 31: Classical watch and signaling tower on Mt. Velatouri, Attica (Lohmann 1992:44)

Figure 32: Classical farmhouse with *andron* in Palatia Kopraisia, Attica (Lohmann 1992:47)

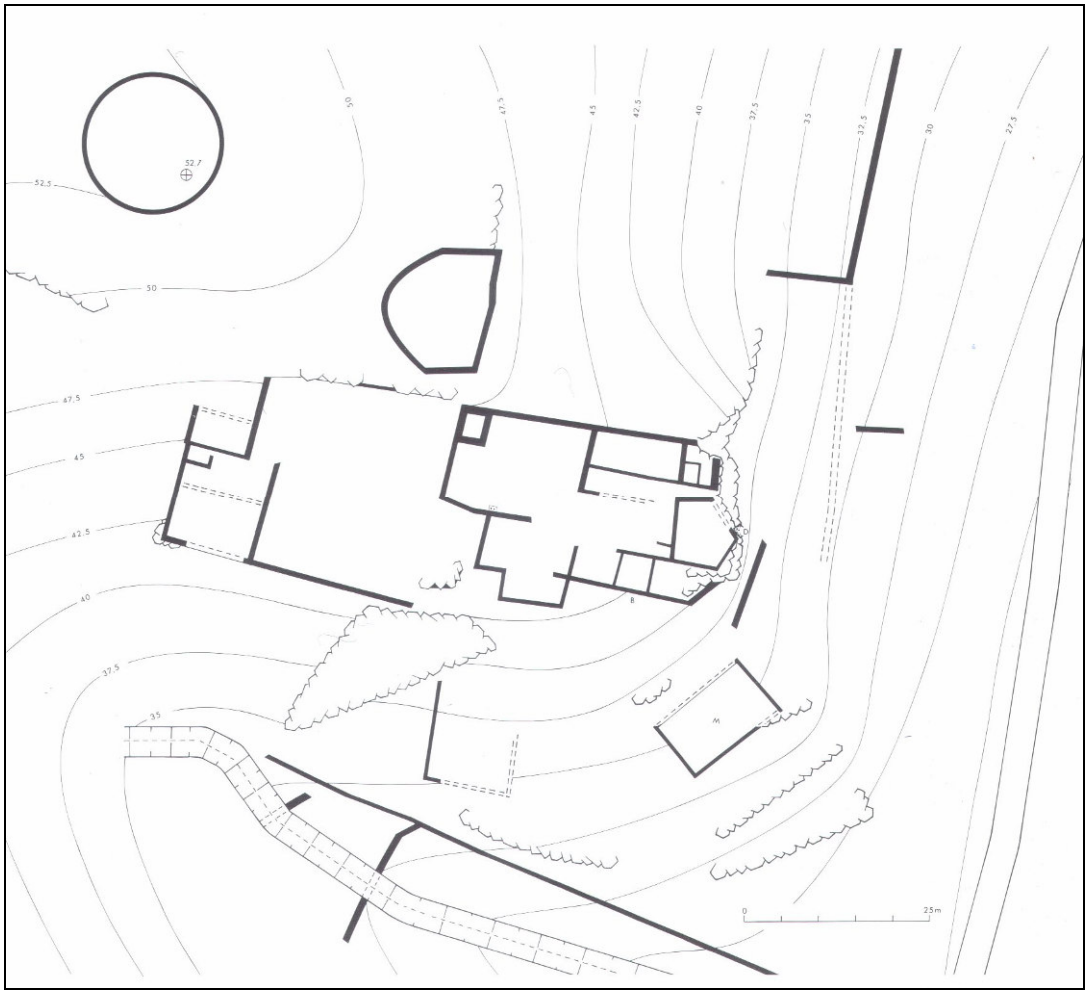

Figure 33: Classical farm estate (LE 17) with tower in Palatia Kopraisia, Attica,(Lohmann 1992:49)

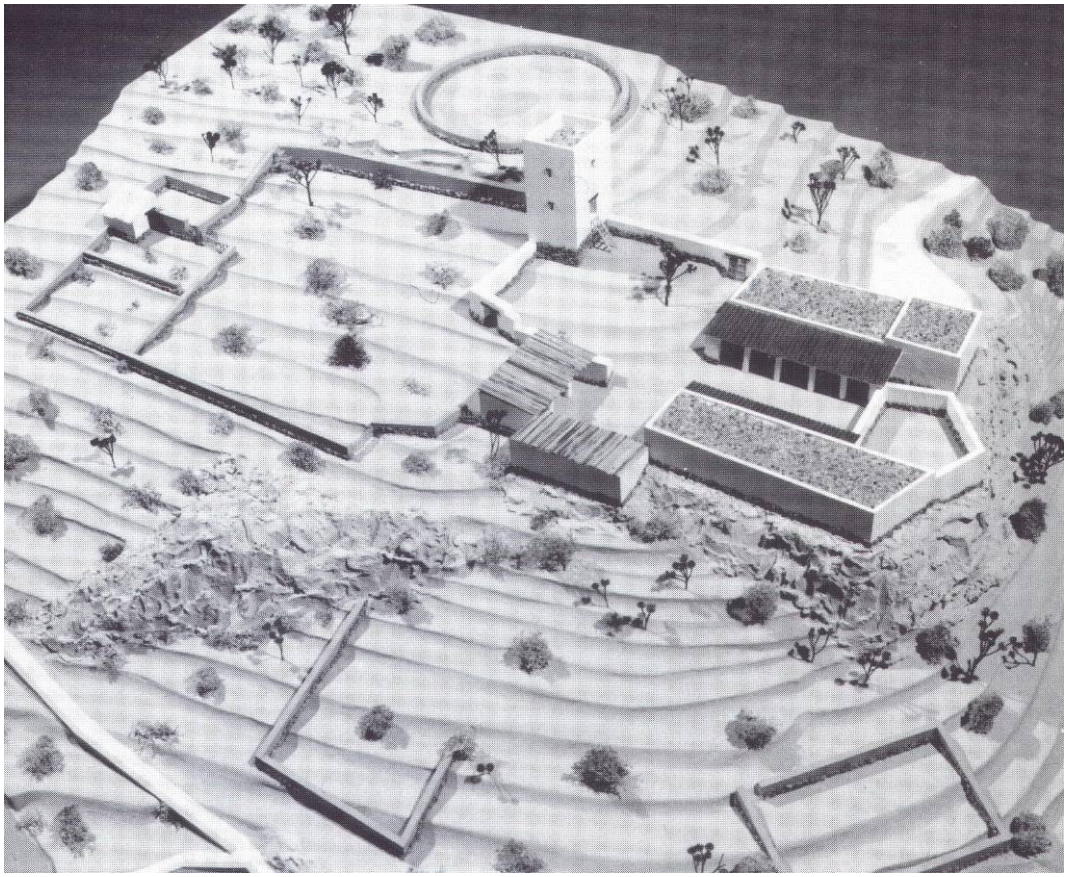

Figure 34: Reconstructed model of the Classical farm estate (LE 17) in Palatia Kopraisia, Attica (Lohmann 1992:48)

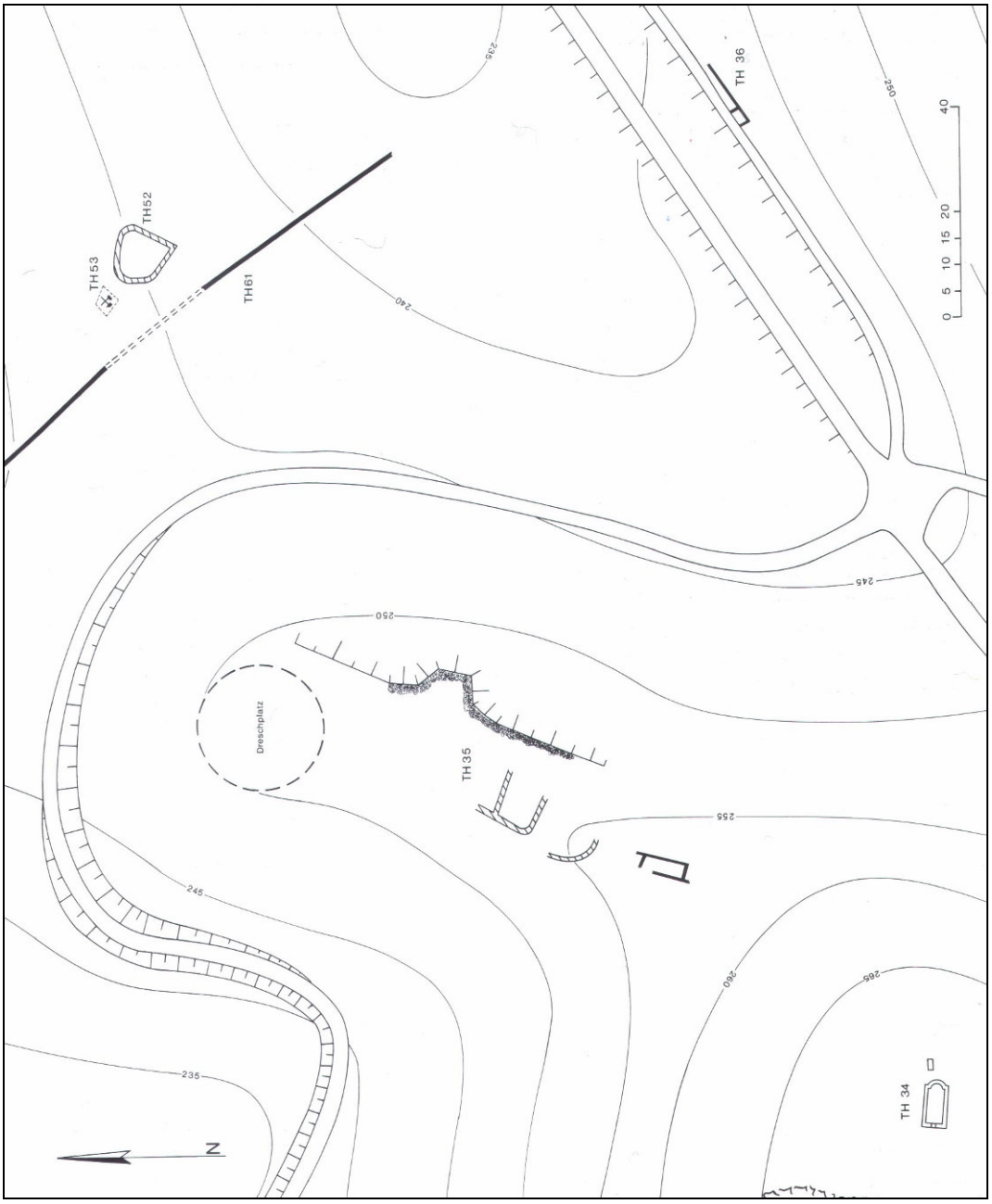

Figure 35: Classical farm estate (TH 35) at Thimare, Attica with graveyard (TH 36) (Lohmann 1992:50)

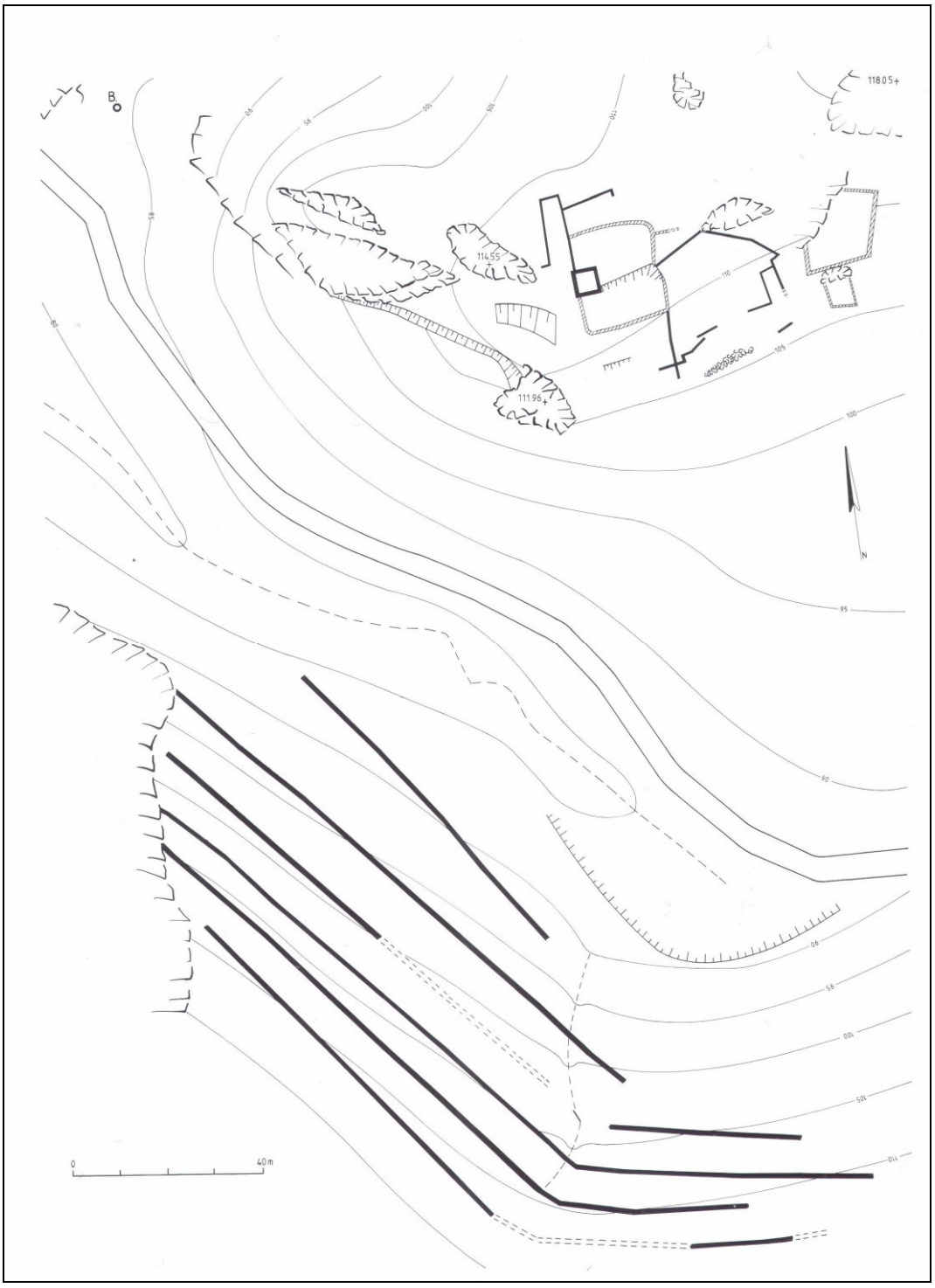

Figure 36: Classical farm estate at Aghia Photeine, Attica and agricultural terraces (Lohmann 1992:52)

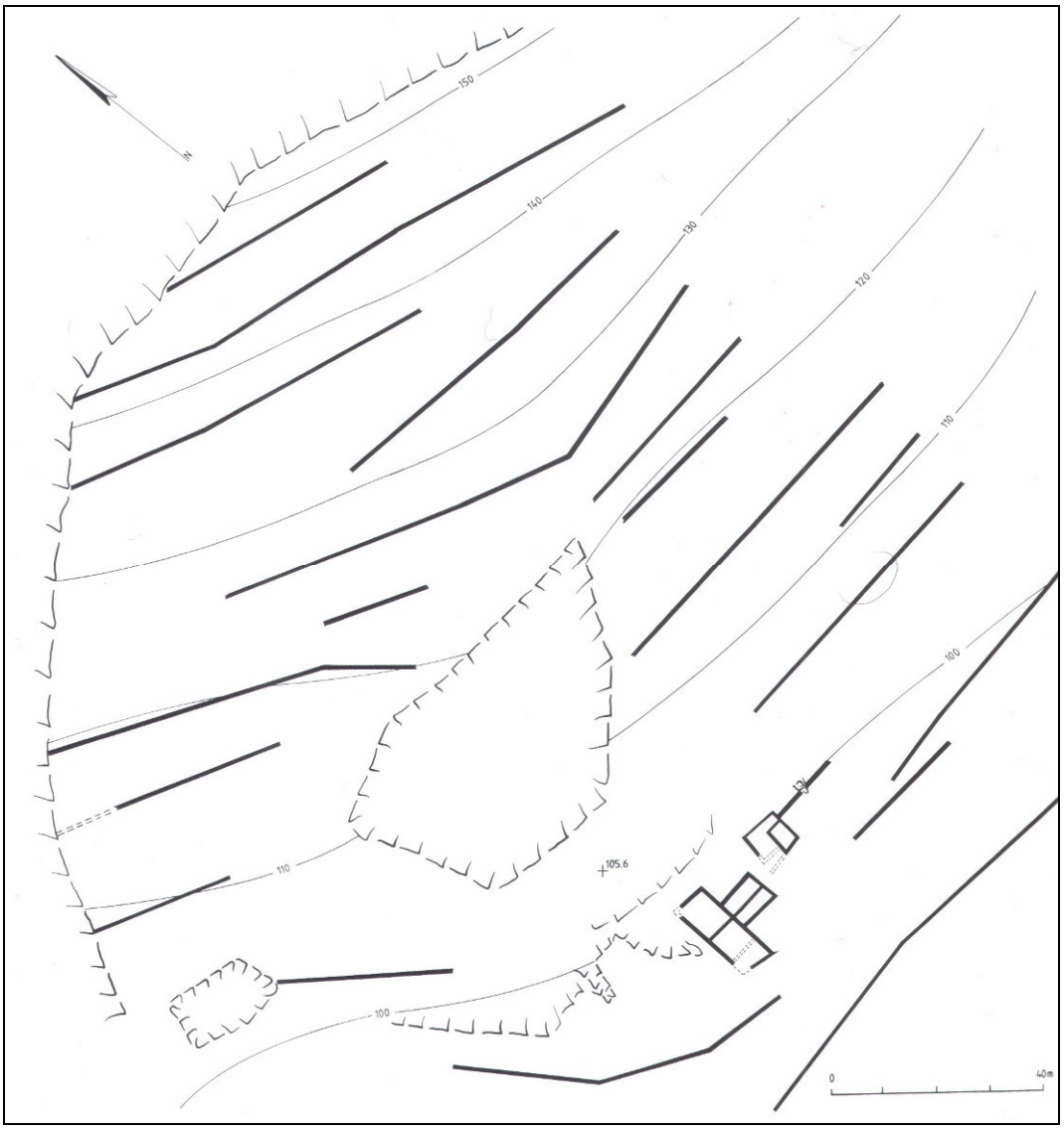

Figure 37: Classical farm estate surrounded by agricultural terraces, Charaka, Attica (Lohmann 1992:54)

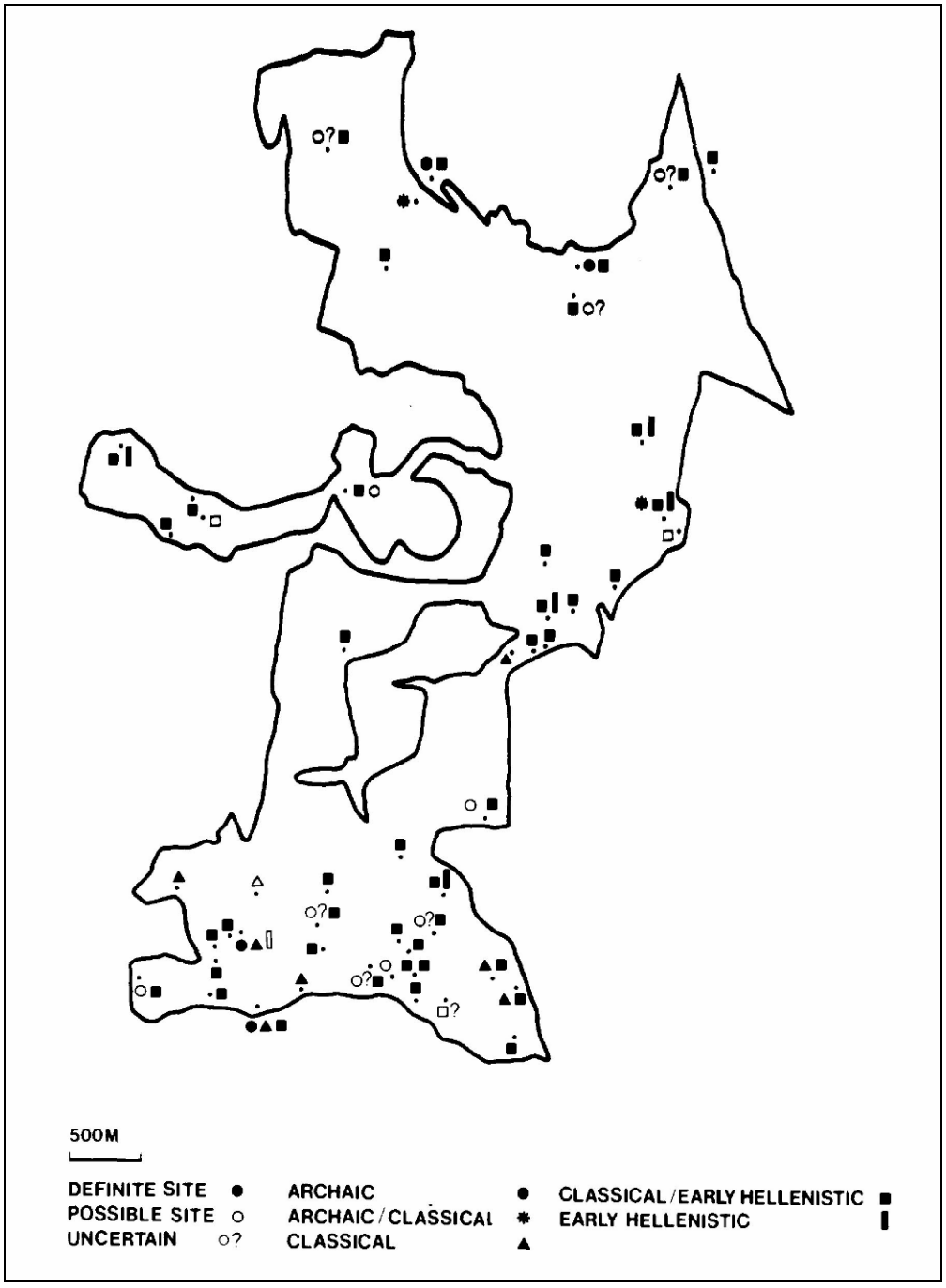

Figure 38: Distribution map of Archaic to Early Hellenistic sites in the Boeotia Survey (eastern part) (Bintliff and Snodgrass 1985:140)

Figure 39: Distribution map of Archaic to Early Hellenistic sites in the Boeotia Survey (Valley of Muses) (Bintliff and Snodgrass 1985:141)

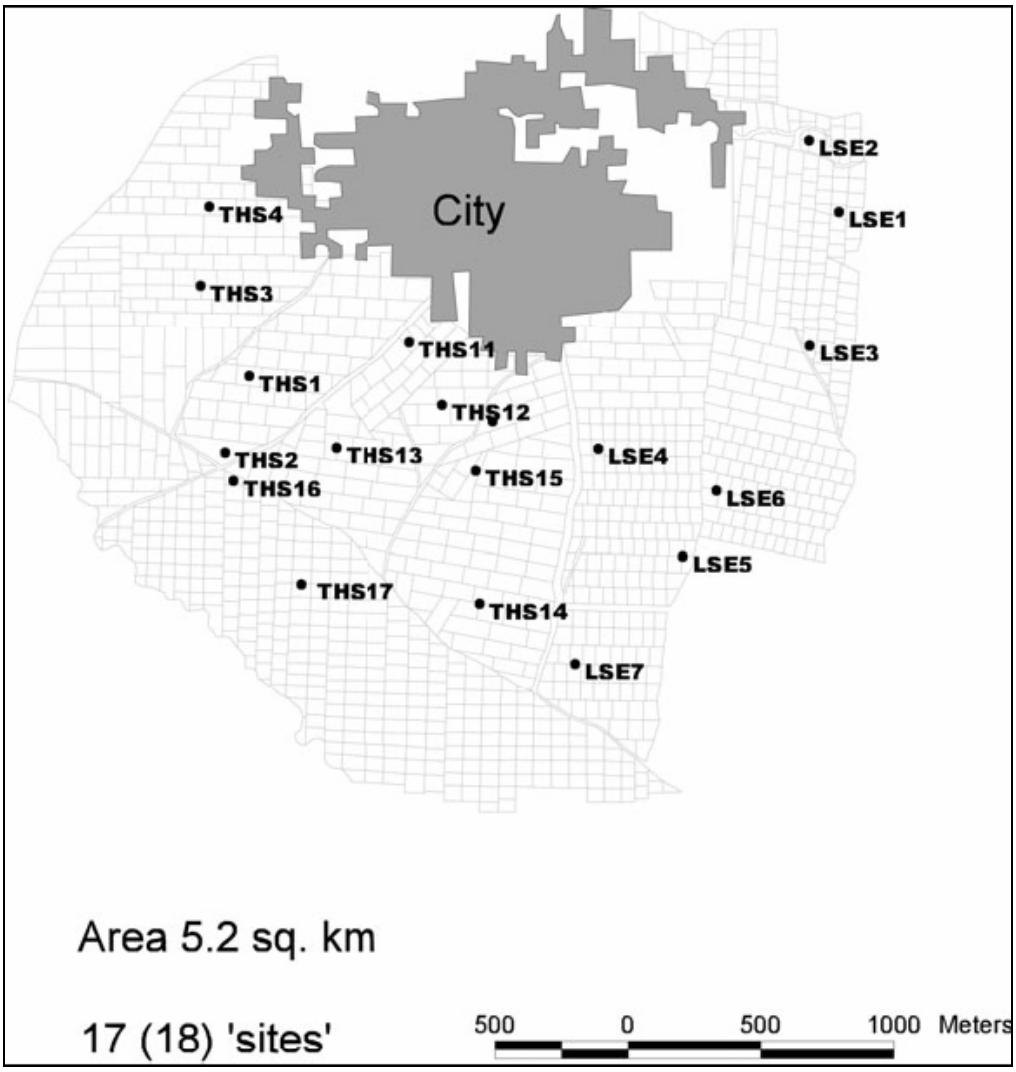

Figure 40: Distribution of rural sites in the Thespiae South-Leondari Southeast sector of Boeotia Survey (Bintliff 2005:138)

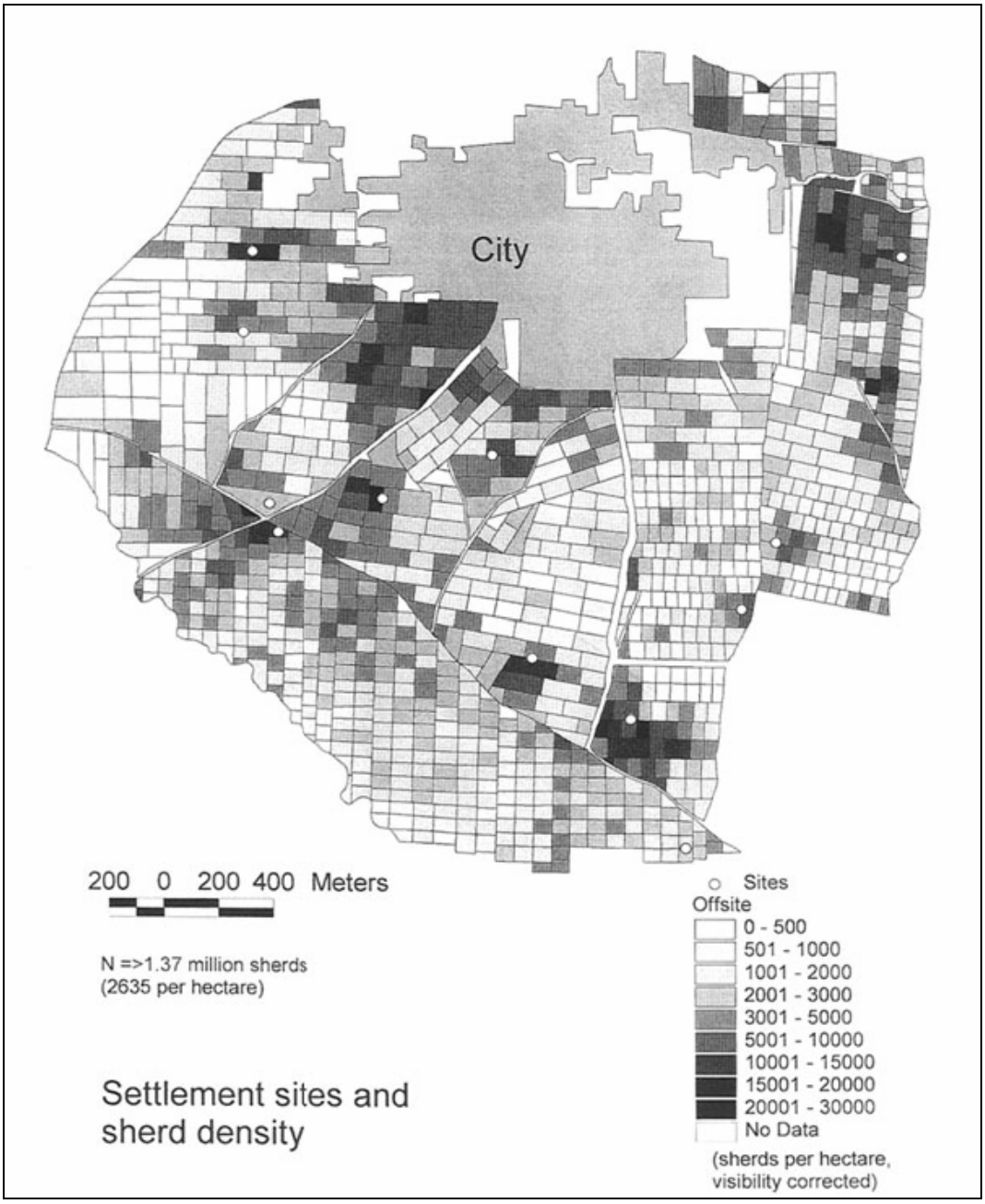

Figure 41: Density of off-site surface ceramics in the sectorshown in Figure 36, with rural sites as white spots (Bintliff 2005:139)

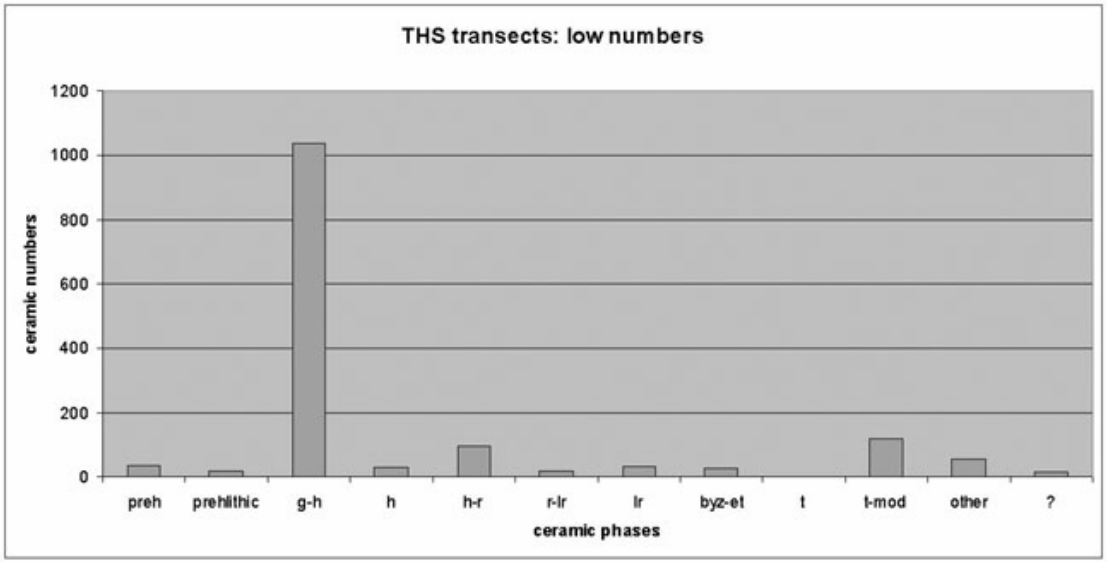

Figure 42: Chronological breakdown for the off-site field walking collections from the Tespiae South Sector, Boeotia; “g-h” represents ceramics dated to Classical period (Bintliff 2005:140)

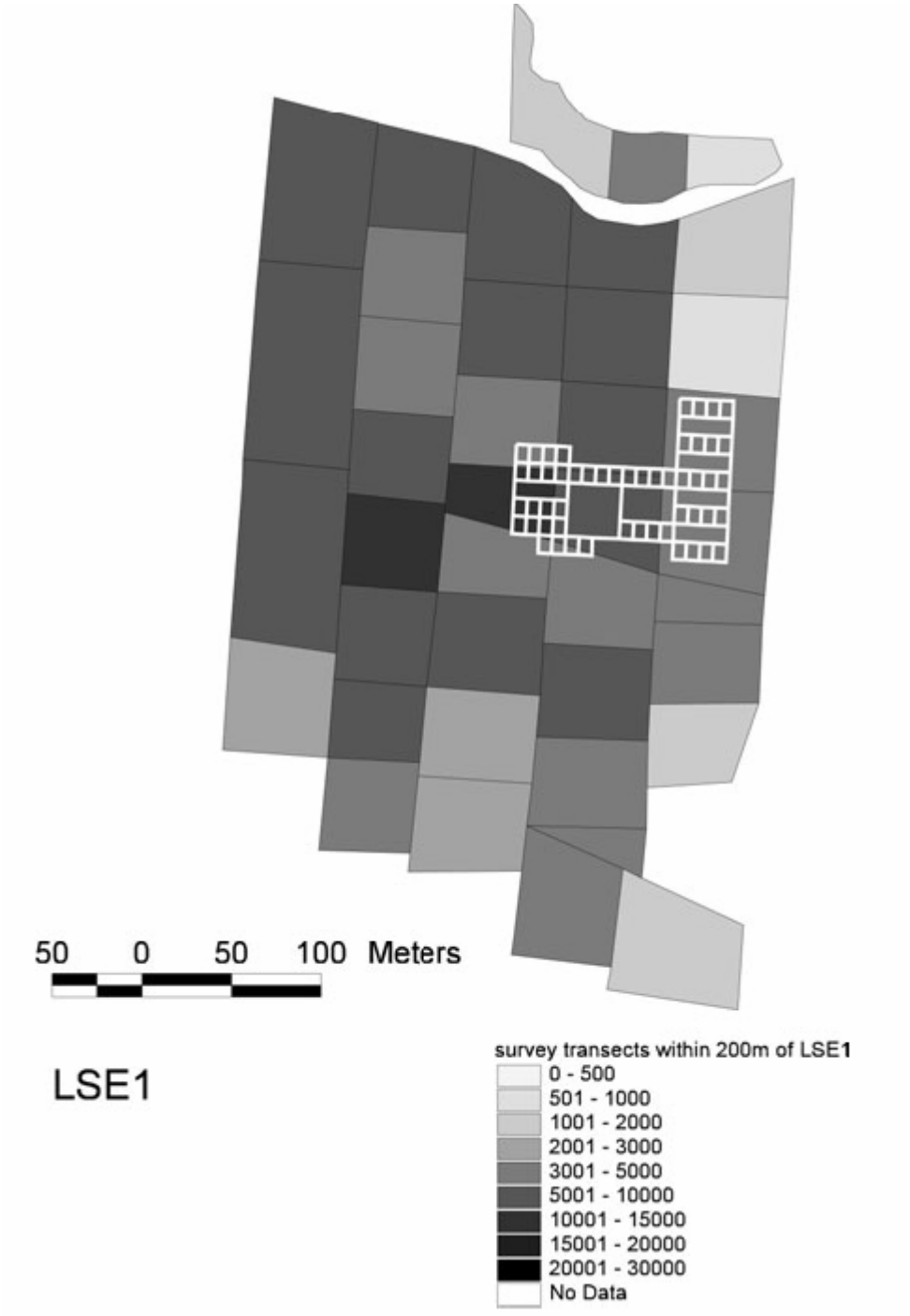

Figure 43: Density of off-site pottery around a rural site (LSE1) (Bintliff 2005:141)

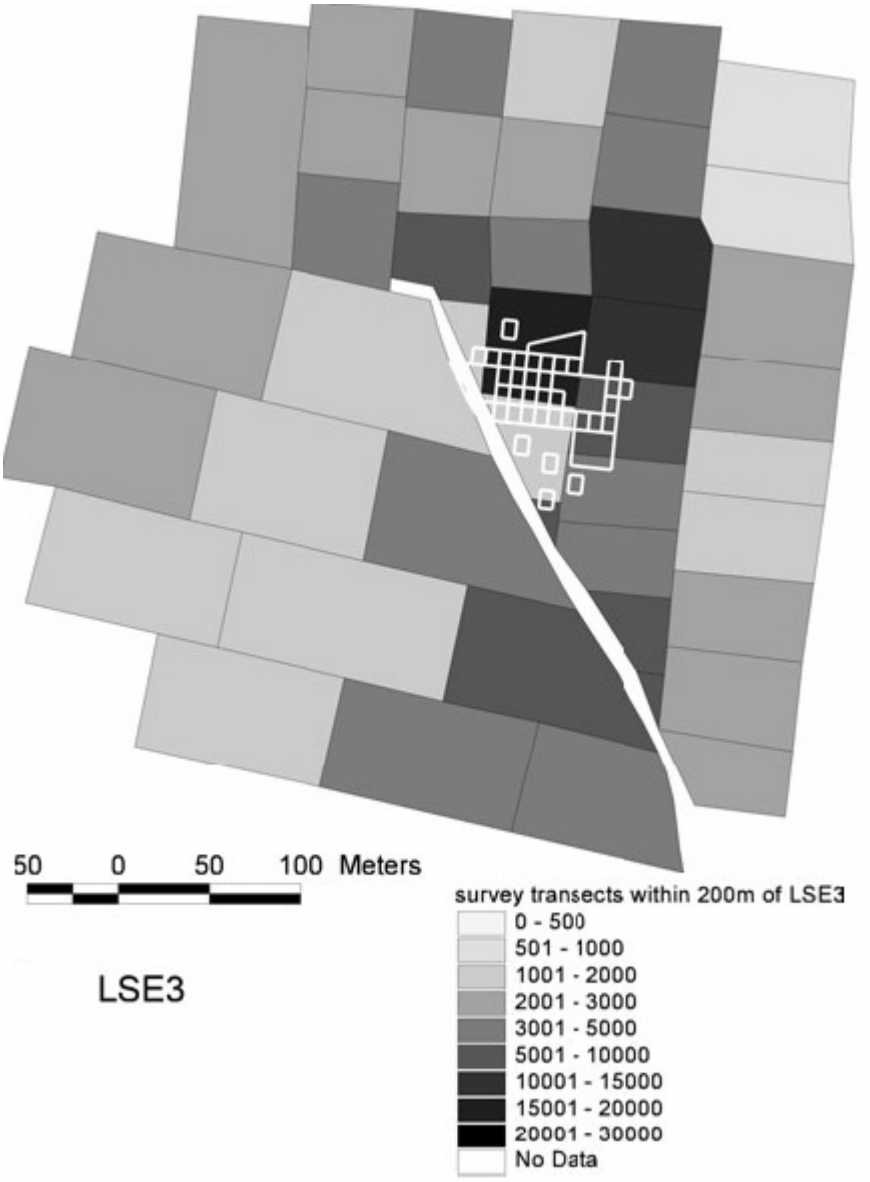

Figure 44: Density of off-site pottery around a rural site (LSE3), which is slightly more distant from the ancient city of Thespiae (Bintliff 2005:142)

Figure 45: Map of Greece showing the location of Oropia (Cosmopoulos 2001:5)

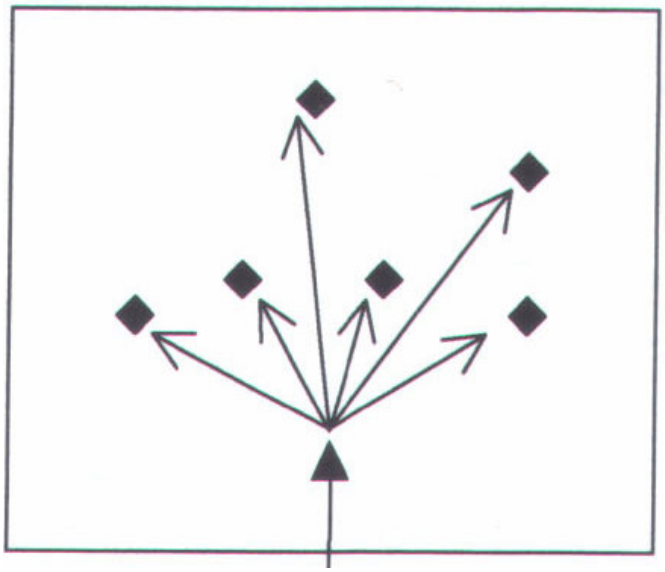

Figure 46: Graphic representation of first type of rural dispersion (Cosmopoulos 2001:21)

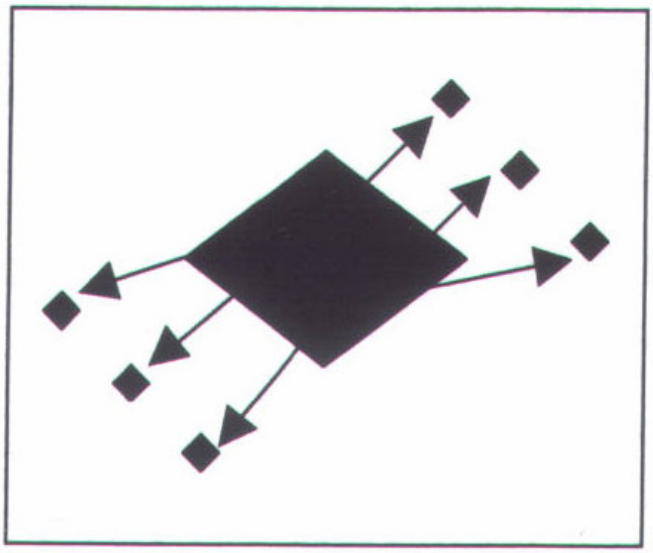

Figure 47: Graphic representation of second type of rural dispersion (Cosmopoulos 2001:21)

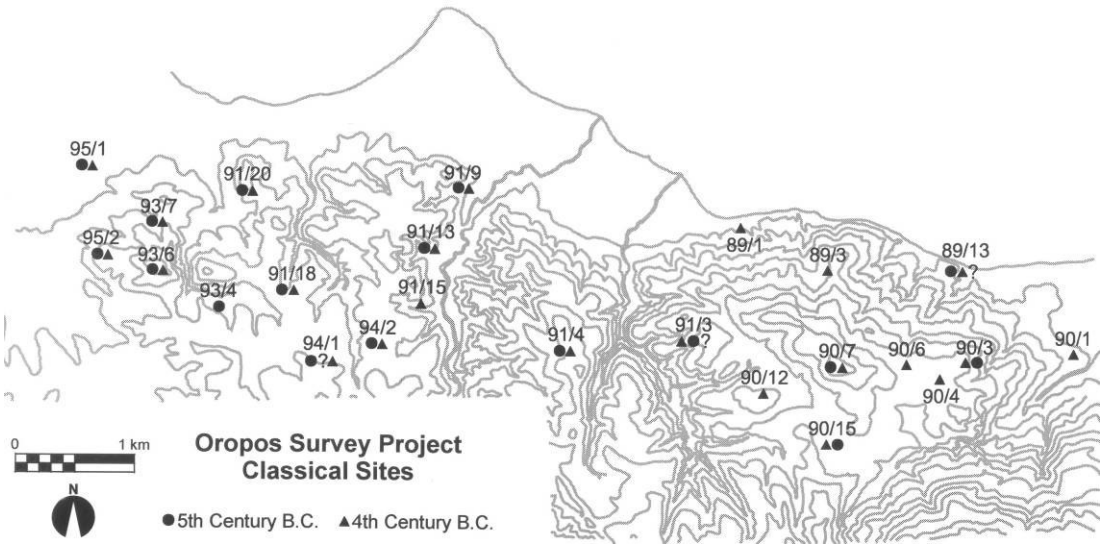

Figure 48: Map showing Classical sites detected in the Oropos Survey (Cosmopoulos 2001:34)

Figure 49: The Temple of Amphiaraos, Oropia (Cosmopoulos 2001:14)

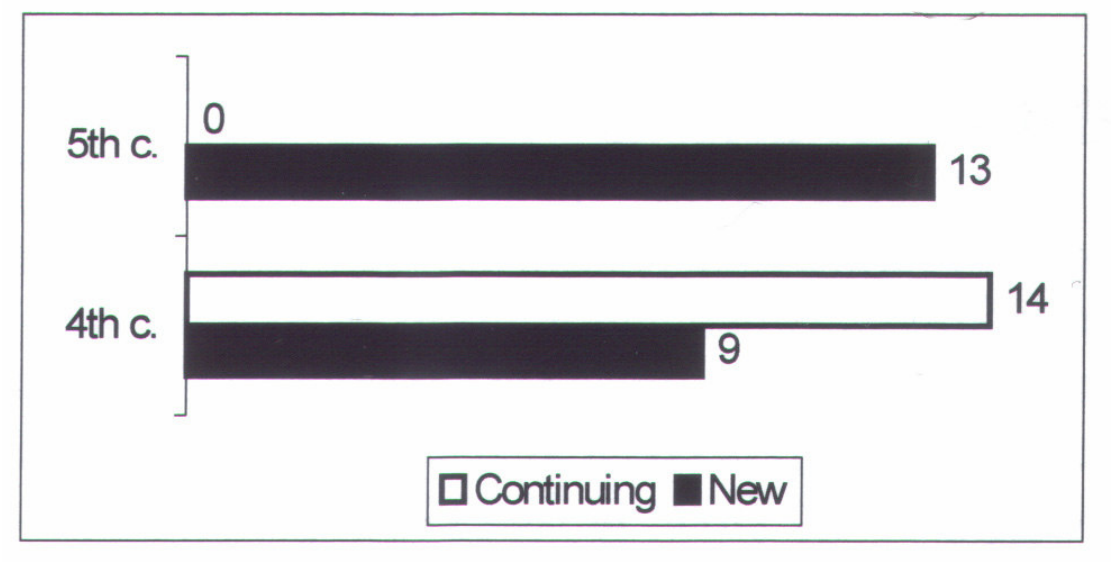

Figure 50: Continuity in Classical findspots in Oropia (Cosmopoulos 2001:58)