Economic Geography of the Ancient Greek Countryside: A re-examination of monumental rural sites on the island of Siphnos.

VOLUME I
TEXT

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THESIS SUBMITTED IN PARTIAL FULFILMENT OF REQUIREMENTS FOR DEGREE OF DOCTOR OF PHILOSOPHY IN CLASSICAL ARCHAEOLOGY, UNIVERSITY OF OXFORD
HILARY TERM 1998

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THESIS

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UNIVERSITY COLLEGE, OXFORD UNIVERSITY

ABSTRACT OF THESIS SUBMITTED FOR DEGREE OF DOCTOR OF PHILOSOPHY IN CLASSICAL ARCHAEOLOGY
HILARY TERM 1998

Economic Geography of the Ancient Greek Countryside: A re-examination of monumental rural sites on the island of Siphnos.

PART I: APPROACHES TO THE STUDY OF THE ANCIENT GREEK COUNTRYSIDE

CHAPTER 1: THE ANCIENT GREEK COUNTRYSIDE IN CLASSICAL SCHOLARSHIP

The Introduction locates the present study within the wider historiography of research into the ancient Greek countryside, assessing the contribution of geographical, archaeological and anthropological studies to the history of the ancient countryside, and analysing the methods which have tended to place the subject on the margins of traditional, text-based studies of the ancient world.

CHAPTER 2: THE CONTEXT OF THE CASE STUDY

Ch. 2 justifies the choice of the island of Siphnos as a case study to reassess the archaeology of the ancient Greek countryside in the light of the **Ch. 1**. The regional context, and the physical environment of this particular *polis*, are briefly described.

CHAPTER 3: THE ARCHAEOLOGICAL RECORD OF RURAL SITES

More than fifty rural sites exhibiting monumental masonry construction (towers and associated structures) have been recorded throughout the *chora* of Late Classical-Hellenistic Siphnos. Problems in identifying and dating occupation at rural sites are discussed within the context of the island's topography and long-term settlement history. Historical, epigraphic, ethnographic and archaeological evidence is considered with regard to the interpretation of monumental rural sites. The sites are then re-examined with regard to their architectural construction (**Ch.4**), their location and distribution (**Ch.5**), local land use (**Ch.6**), and the regional context of the countryside (**Ch.7**), in order to examine the economic geography of the *polis*.

PART II: MONUMENTAL RURAL SITES IN THE CHORA OF ANCIENT SIPHNOS

CHAPTER 4: SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE - ARCHITECTURE OF RURAL SITES

The rural sites are analysed according to their architectural plan, construction, orientation, and the presence of adjoining and adjacent structures, walls, courtyards, buildings and water collection devices.

CHAPTER 5: SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE - LOCATION AND DISTRIBUTION OF RURAL SITES

The location of rural sites is examined according to aspect, elevation, coastal distance, intervisibility and nearest neighbour analysis in order to examine hypotheses concerning their functions. It is argued that the majority of rural sites on Siphnos fulfilled an agrarian, rather than strategic function.

CHAPTER 6: SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE - LAND USE AT RURAL SITES

Many monumental rural buildings were built on steep sloped uplands (*eschatiai*). Strategies of land use (including extractive activities, agriculture, animal husbandry) are considered in relation to the architecture and location of rural site complexes.

CHAPTER 7: CONCLUSION - RURAL SITES AND THE *POLIS*

The Conclusion evaluates the findings of the case study according to patterns of rural building and land use in the ancient Greek countryside and discusses future opportunities for research in the subject.

Volume II contains Appendices and Plates relevant to the case study in **Volume I**.

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ABBREVIATIONS IN TEXT

ATL = The Athenian Tribute Lists, vols. i-iv. B.D. Meritt, M.F. McGregor, H.T. Wade-Gery (1939-1953). Princeton.
D.N.B. = Dictionary of National Biography. London.
FGrH = Die Fragmente der griechischen Historiker, ed. F. Jacoby.
IC = Inscriptiones Creticae. Opera et Consilio Friderici Halbherr Collectae. Rome.
ID = Inscriptions de Délos. Actes des Fonctionnaires Athéniens Préposés a L'Administration des Sanctuaires Après 166 Av. J.-C, eds. F. Durrbach & P. Roussel (1935). Paris.
IG = Inscriptiones Graecae. Berlin.
Liddell & Scott = A Greek-English Lexicon compiled by H.G. Liddell & R. Scott (9th ed. with revised supplement, 1996). Oxford.
LGPN 1 = A Lexicon of Greek Personal Names. Vol.1: *The Aegean Islands, Cyprus, Cyrenaica*, (eds.) (1987) P.M. Fraser and E. Matthews. Oxford.
OED = Oxford English Dictionary.
OGI = Orientis Graeci Inscriptiones Selectae, ed. W. Dittenberger (1903-5). Leipzig.
PAE = ΠΡΑΚΤΙΚΑ ΤΗΣ ΕΝ ΑΘΗΝΑΙΣ ΑΡΧΑΙΟΛΟΓΙΚΗΣ ΕΤΑΙΡΕΙΑΣ. Athens.
PCG = Poetae Comici Graeci, eds. C. Austin & R. Kassel (1983-9). Berlin.
P.Tebt. = Tebtunis Papyri, eds. B.P. Grenfell, A.S. Hunt, J.B. Smyly (1902). London.
RE = Paulys Real-Encyclopädie der Classischen Altertumswissenschaft. Stuttgart.

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'Anthropologists like to conduct their controversies in open meetings, where they rise and make flamboyant, unforgivable speeches. Classicists are almost always polite — with the result that it is frequently impossible to find out what they think.'
Redfield 1991: 5

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PREFACE

> 'I am concerned rather with questions about the *nature* of the ancient rural landscape of Greece: what did it look like, what was its condition in environmental terms, how far was it diversified, how far was it inhabited, and what went on there besides farming? What, in short, can we establish about the economic geography of rural Greece?'
> Snodgrass 1987: 69

This study is intended as a contribution to the history of the countryside in classical antiquity, and undertakes to study the physical basis on which the Greek *polis* rested, namely its territorial sector and the rural economy.[1] Part I offers theoretical and substantive treatment of approaches to the subject, leading to a detailed case study in Part II.

Chapter 1 traces the intellectual history of rural research from the publication of Paul Guiraud's *La propriété foncière en Grèce jusqu' à la conquête romaine* in 1893, with special focus directed towards research conducted since the publication of *Problèmes de la terre en Grèce ancienne* in 1973.[2] The purpose of the exercise is not to provide an exhaustive historiography of the subject, but rather to offer a selective account of modern scholarship (primarily French, British and American) whose influence continues to be felt in current debates on ancient Greek history, and which provides a critical context for the case study.

Chapter 2 introduces the case study — the countryside (*chora*) of the island of Siphnos — and assesses the usefulness and limits of the evidence. The physical environment of the island is outlined in order to provide a regional context for the archaeological examination of the countryside. The archaeological record of monumental rural sites is analysed in Chapter 3 with regard to historical, epigraphic, ethnographic and ethnoarchaeological evidence, in order to assess the range of possible functions which such sites may have fulfilled in the Late Classical-Hellenistic period.[3]

Part II orientates research problems arising from Part I towards the case study. The analysis begins at the level of the individual site and its immediate environs: the architectural plan and material quality of construction, the presence of adjoining and adjacent structures, walls, courtyards, buildings and water collection devices (Chapter 4).

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1 Snodgrass 1991a: 2; Murray 1992: 12.

2 Finley 1973a.

3 It might be argued that the examination of literary, epigraphic and archaeological material respectively is to be seduced into what Finley termed the 'unexpressed proposition' which gives automatic priority to literary evidence, against which material remains are evaluated (Finley 1985b: 21). However, the purpose in this case is to examine the range of possible functions of monumental rural sites, which may most usefully be achieved by successive examination of independent written records (ancient and ethnographic), and archaeological evidence (ancient and ethnoarchaeological). For the respective treatment of independent, and inter-dependent historical, epigraphic and archaeological material, see Dyson 1995: 31-32 .

In Chapters 5-7 the topography of individual rural sites is analysed within the regional context of the *polis*, and the island's own wider inter-regional context. The hypothesis that the archaeology of the rural landscape represents the remains of a signalling network is discussed (Chapter 5). It is argued instead that the location and distribution of the majority of monumental rural sites on Siphnos indicate a primarily agrarian, rather than a strategic or military function. The majority of sites are therefore best interpreted as the remains of domestic agricultural buildings. It is in this light that the thesis analyses the contribution which these rural sites can make to our understanding of patterns of land use — for example the exploitation of marginal land (*eschatiai*), regimes of agriculture and animal husbandry — and to debates concerning the nature of settlement and society in the ancient Greek countryside (Chapters 6-7).

There is, of course, a limit to the scope of work which can be undertaken within the confines of a D. Phil. thesis format. Eduard Meyer once commented that a characteristic of historical research was its infiniteness in every direction, 'out of one question we put to it there always arise new ones of interest',[4] and it is thus probably wise to begin by offering a justification of the topics chosen, and sketching the limits of the current research.

The focus of investigation is limited to what has been termed the 'economic geography of rural Greece' in antiquity.[5] The use of 'economic' as an adjective of geography, and 'rural' of Greece invites clarification at the outset. There is a danger that 'economic geography' — the location of agrarian and non-agrarian production (incorporating diverse activities of cultivation, extraction and processing) — may imply a wholly autonomous sphere,[6] ignoring other (inter-related) 'geographies' of the Greek *polis* (for example the geography of war or the geography of cult) or subordinating them to a dominant 'economic' explanation.[7] However, the purpose here is to analyse many diverse aspects of human activity in the countryside (including cultic and military dimensions) from the perspective of land use, in order to answer questions about the form, function and meaning of rural sites.[8]

Likewise, the use of 'rural' as applied to settlement and land use only has analytical meaning in the context of an *urban* counterpart (whether the relationship tends towards the symbiotic or

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4 Meyer 1910: 230. On the problem-orientated nature of historical enquiry, Finley 1985b: 6.

5 Snodgrass 1987: 69.

6 See Austin 1986: 451.

7 Austin & Vidal-Naquet 1977: 8-10. For the centrality of the countryside to warfare, and to citizen ideology in the *polis*, Osborne 1987: 138; Hanson 1995: 221. For the religious dimension of the countryside, Humphreys 1993: xx; de Polignac 1995. For 'non-economic' aspects of rural productive activities, such as agriculture, Detienne 1963: 56-7.

8 *viz.* Febvre 1925: 82-3, 'The fact is that political history, economic history, and social history are closely bound together. In the same way there can be no political and historical geography without social geography, nor social geography without economic geography, nor economic geography without physical geography.'

oppositional),[9] and thus for ancient Greece must inevitably be implicated in the study of the *polis* as a whole. The problem, as with many aspects of modern study directed towards the 'ancient city', is one of terminology.[10] The Greek word associated with the rural sector of the *polis* is '*chora*',[11] but a satisfactory translation which incorporates polyvalent qualities of 'territory', 'countryside' and 'land' remains elusive.[12] Thus throughout this work, terms such as 'rural' and 'countryside' are used as broadly descriptive, rather than restrictive categories; the flexibility of meaning is reflected in the transliteration of *chora*.

In dealing with such a subject in the case study (Part II), the question of sources for ancient economic history in general,[13] and rural history in particular,[14] deserves attention. The general silence of ancient literary sources on the subject is acknowledged with rare unanimity among 'primitivists' and 'modernists' alike.[15] The limited ancient literary sources which are concerned with the subject — even, to use the metaphor of Bloch,[16] as one landscape 'snapshot' on a continuous roll — survive only in a frustratingly fragmented state,[17] while the geography of Strabo and the travels of Pausanias reveal less about rural settlement, population and agriculture than, for example, the fictional work of a [Dikaiarkhos] or Apuleius.[18]

However, the neglect of the Greek countryside in the ancient written sources has not always been paralleled by a similar neglect among scholars of the nineteenth and twentieth centuries, a state of affairs which would seem surprising given the tradition of literary-orientated scholarship in

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[9] Wrigley 1991: 109; Snodgrass 1994: 483. See also Wagstaff 1982: 13-28 for geographical definitions of 'rural' settlement; Sanders 1977: 2-3 on the concept of 'rural' as an analytical category.

[10] Piggott 1972: 948; Finley 1981: 5; Finley 1985a: 123. For problems of terminology connected with the rural sphere (such as 'farm' and derivatives) see also Finley 1952: 258 n.98; Brunet 1992; Burford 1993: 15; Hanson 1995: 495.

[11] e.g. Isokrates IV.42.

[12] On the meanings of *chora*, Vallet [1968] 1996: 35; Derrida 1987. Leveau 1984b: 91 for respective differences in meaning between French *paysage/terroir*, German *Siedlung/Landschaft*, and English *settlement*.

[13] Will 1954: 7, Mossé 1995: 23-24 for the source problems concerning ancient Greek economic history; also Hopkins 1978: 36 for general problems of evidence.

[14] Burford 1993: 13-14; *cf.* Rackham 1986: 6 for the importance of archaeology in rural history, and the potential of written sources to mislead.

[15] Rostovtzeff [1926] 1957: 192-3, 'It is no wonder that for us the life of the ancient world is more or less identical with the life of the ancient cities. The cities have told us their story, the country always remained silent and reserved. What we know of the country we know mostly through the men of the cities...The voice of the country population itself is rarely heard.' *Cf.* Zimmern 1924: 20; de ste Croix 1981: 9-19; Segal 1981: 6. For the paradox of the unmentioned countryside, see Osborne 1987: 197.

[16] See Bradford 1957: 3.

[17] Orth 1924; Snodgrass 1987: 89-91; Alcock 1993a: 3-5.

[18] For the usefulness of Apuleius for social history, Millar 1981; Saïd 1987: 149-150. Snodgrass 1987: 88, 'Strabo, even in the first and more systematic part of his description, exhibits no more interest than Pausanias in the landscape as a field for, and in part the product of, human activity. On the *economic* geography of the countryside, both authors are essentially silent'. *Cf.* van Andel & Runnels 1987: 4, 'Through our imagination, consequently, we must fill with farms, hamlets or villages the apparent emptiness of the ancient Greek countryside, because we are seldom given an

Classics for much of its history as an academic discipline. In presenting a critical review of scholarship as an introduction to the work, I endorse R.G. Collingwood's statement that no historical problem should be studied without studying the history of historical thought about it.[19] The purpose is well summarised by one of the greatest modern historiographers of classical scholarship,

> 'The only justification for the history of scholarship is the promotion of scholarship itself. This means that we must go into the past of the discipline we profess in order to learn something new or to be reminded of something which we had forgotten, which is almost the same. Generally speaking, the history of classical scholarship should point to new desirable directions of classical scholarship. Thus a history of classical scholarship should not only be organized according to problems, but some distinction should be established between viable themes and dead issues. It is ultimately the discovery that certain scholars of the past still have something to teach that makes the study of past scholarship acceptable.'
> Momigliano [1982] 1994: 223

There are undoubtedly limits to such an approach: a 'genealogical link' between individuals or schools may not explain the intentions of the borrower,[20] nor may certain scholars necessarily be traced to a contemporary intellectual tradition or considered the dominant player in a 'national' school, despite their individual eminence.[21] Nonetheless, the enterprise can, as Arnaldo Momigliano noted, stimulate research problems of continuing relevance today,[22] as well as delineate underlying assumptions on which previous scholars have theorised (relevant to the subject of ancient rural Greece, where research work has often been undertaken by foreign archaeological schools).

On a practical level, the need for a critical historiography of research into the ancient Greek countryside is acute. Since the 1960's, the scope of Western archaeological scholarship has significantly broadened from the topographic and military studies which had predominated previously to include questions about the ancient economy that had been raised by historians much earlier in the century.[23] This scholarly tradition has largely gone unanswered (or unnoticed) by field

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inkling of their existence, let alone of their appearance. For most ancient Greeks the countryside merely served to separate one town from another.'

[19] Collingwood 1939: 132; also Foucault 1972: 136-137; Finley 1975: 61, 76; Bruneau 1984-5a: 131-2; Gellner 1988: 13; Trigger 1989: 2; Humphreys 1993: xxviii.

[20] Finley 1975: 81.

[21] Finley 1981: xix. For 'national' schools and individuals, Connor 1986: 342; also Redfield 1991: 11, 'In the generation before my own I could mention, among others, M.I. Finley, Arnaldo Momigliano, J.P. Vernant, Michael Jameson. All these reached the highest levels of the profession; they were accepted as classicists and admired as theorists. Yet at the same time they were not (at least in the English-speaking world) models to their profession. If Finley wanted to read Malinowski and Karl Polanyi, if Vernant wanted to read Mauss and Lévi-Strauss, that was, so to speak, *their problem*; theorists of this kind did not become an integral part of education in the classics.'

[22] e.g. Finley 1977, Gawantka 1985 for historiographies of modern research into the *polis*.

[23] The work of the American J.H. Young in the 1930's provides the most interesting exception. I draw a clear distinction here between the work of 'Western' scholars and Russian (not exclusively Soviet) scholars from the 1920's to 1960's (see Ch. 1).

archaeologists, whose works have tended to include only partial summaries, often focusing on only one 'thread' such as survey archaeology,[24] geography,[25] or landscape studies.[26] Chapter 1 attempts to contextualise these different aspects and offer an integrated review of the contribution made by these disciplines which have informed approaches during the last century of scholarship, and to illustrate their use in Part II.

The abundance of primary archaeological evidence has been an important factor in the selection of Siphnos as a case study (Part II). A catalogue of rural sites on Siphnos has been prepared from a series of topographical researches during the twentieth century.[27] A number of specialised studies concerned with the island's geography,[28] geology and metallurgy,[29] provided further information about available rural resources, supplemented by reports of travellers to the island which provided some additional, comparative information.[30] The information from rural areas could thus be balanced against the (albeit incomplete) publications of akropolis excavations at Ayios Nikitas,[31] Ayios Andreas,[32] and Kastro.[33]

NOTES ON PRESENTATION

The thesis comprises two volumes. *Vol.I* contains the main text, with accompanying Figures (*Fig.*) and Tables (*Table*). *Vol.II* includes Appendices and Plates (*Pl.*). The Appendices include tabulated and cartographic information about monumental rural sites on Siphnos (Appendix 1), and provide comparative data about sites elsewhere in the Aegean islands (Appendix 2) and Mediterranean (Appendix 3). The Appendices are arranged alphabetically according to region (e.g. Argolid, Peloponnese).

Plates prefixed with Roman numeral I (e.g. *Pl.I.3*) accompany Part I. They are differentiated from Plates with Arabic numbers (e.g. *Pl.25.1*). These Plates correspond to each individual rural site on Siphnos, according to the catalogue number of Ashton 1991.

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[24] e.g. Snodgrass 1987: 67-92; Bintliff 1994.

[25] Audring 1989: 5-13 where the focus is upon the contribution of Philippson, Kirsten and Myers.

[26] Shipley 1996.

[27] Especially Ross 1840; Leake 1856; Bent 1965; Tsountas 1899; Dragatsis 1915, 1920, 1924, Young 1956b; Ashton 1991; Preziosi 1994.

[28] Riedl & Kern 1983.

[29] Wagner & Weisgerber 1985.

[30] Simopoulos 1970, 1973; Slot 1982 (*cf.* Bennet & Voutsaki 1991 for the reliability of travellers' accounts). In places where direct information is lacking, the sources and limitations of comparative evidence are made clear.

[31] Dragatsis 1915.

[32] Philippaki 1970, 1973, 1976-1981.

[33] Brock & Mackworth-Young 1949.

All Siphnian site numbers in **bold** refer to the catalogue (**1-55**) in Ashton 1991, which replaces the catalogue numbers of Young 1956b (see concordance in Appendix 1.1).

CHRONOLOGY

The case study incorporates both the late Classical and early Hellenistic periods (approximately fourth to third centuries BC). A growing number of studies have emphasised many aspects of continuity in the social history of the Greek countryside during the early Hellenistic period, as a corollary to a more complex, intra-period chronology which goes beyond the traditional conventions of political-military or cultural 'eras'.[34] It is hoped, however, that in investigating the relationship between human activities and the rural landscape, the case study has broad relevance within ancient Greek social history, and rural history in general.[35]

USE OF MAPS

A brief note is required about the extensive use of maps throughout the text of *Vol.I* and in several Appendices of *Vol.II*. By employing two-dimensional distribution maps I have attempted to contextualise data concerning similarities and variations between archaeological sites which is otherwise extremely difficult to convey in the text, and thus illustrate key points of my argument in a concise manner. I am acutely aware of the limits of social meaning which one may infer from abstract patterns, and the danger of producing potentially reductive conclusions from such an approach.[36] However, by incorporating such maps within a wider perspective of cross-sectional geography, geology and topography, it is hoped that these dimensional elements provide a heuristic rather than a deterministic framework to spatial analysis.

It has been keenly noted that only a stranger, an outsider, requires a map.[37] This is a position of which I was reminded daily when attempting to locate many of these sites on the ground for the first time, and to the local residents of Siphnos, who know the land discussed in this thesis far more

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[34] In this respect I echo the conclusions of a recent study of the defence of the Attic countryside that, 'the early Hellenistic period should not be cut off from the Classical era, as is so often the case.' (Oliver 1995: 288). Also Alcock 1994: 177; Bintliff 1997: 10 for intra-Hellenistic chronology (*cf.* Austin 1986: 450; *CAH* VII.I^2: 290-292). This somewhat goes against the chronology of a recent history of the ancient Greek countryside (Hanson 1995: 21), which combines Archaic and Classical periods (c.700-300 BC) as the '*polis* period', and treats the countryside of the Hellenistic world very much as a separate phenomenon. The broad conventions of dating, however arbitrary, are kept for the sake of convenience (i.e. Archaic = ~700-480 BC, Classical = 480-338 BC, Hellenistic = 338-146 BC) with Late Classical denoting the 4th century BC, and early Hellenistic denoting the third century BC. For the post-Roman period, Medieval generally refers to the period before 1500 AD, early Modern to the sixteenth to eighteenth centuries AD, and Modern to post-Independence Greece.

[35] In this respect, the study may be seen as a contribution to 'anonymous history' (Braudel 1980: 10; Samuel 1994: 38).

[36] Bourdieu 1977: 2; Shanks 1992: 23-24; Morris 1994b: 45.

[37] Gosden 1994: 116.

intimately than I, it is hoped that such illustrations convey, at least dimly reflected, a little of that knowledge kindly shared.

SPELLING AND TRANSLITERATION

Although I aimed for consistency in the spelling of Greek words — generally avoiding the Latinised spelling of proper names (such as c for κ) — there are, inevitably, inconsistencies. Most notably, I have kept Latinised spelling for the Cyclades and other commonly used toponyms. I have attempted to transliterate spellings of individual Greek words cited in the main text, where their usage represents a general type or group (e.g. *polis*, *oikos*, *pyrgos*, *eschatiai* etc.). However, where philological context requires discussion of a particular Greek word, I have tended to keep such words in Greek font. Siphnian toponomy and orthography used is that of Birkett-Smith 1995, unless otherwise stated. Square Brackets [ ] around an ancient author's name denote that the attribution is likely spurious.

BIBLIOGRAPHY

Bibliography includes material published until and including December 1997 (other forthcoming material is cited as forthcoming where considered relevant). The Bibliography situated at the end of *Vol.I* only contains works of reference cited in the main text. Appendices 2 & 3 in *Vol.II* contain their own separate bibliographies.

PART I

APPROACHES TO THE STUDY OF THE ANCIENT GREEK COUNTRYSIDE

'Students of the history of Graeco-Roman civilization have been slow in assimilating the methods of workers in other fields of historical and social inquiry.'
Zimmern 1928: 165

'Most ancient cities-states were small places, where the city core blended with an agricultural suburban zone and the surrounding agricultural areas where the bulk of the population lived. Most ancient cities were essentially rural central places. However, the average academic intellectual including the classical archaeologist has been an urban person with little understanding of or interest in the countryside. The result has been, until recently, the creation of a text that neglects not only the urban poor, but also rural life in general.'
Dyson 1995: 35-36

CHAPTER 1

THE ANCIENT GREEK COUNTRYSIDE IN CLASSICAL SCHOLARSHIP

> 'Paul Guiraud's *La propriété foncière en Grèce* was published in 1893. Since then, thanks to the curious predilection of students of classical antiquity for not studying in depth some of the most fundamental aspects of ancient society, no one has attempted a fresh look at the subject...We hope that the sum will prove to be greater than its parts, that, taken together, the individual studies will stimulate a research programme, to which they point not by rhetorical pronouncements but by example of concrete performance.'
> Finley 1973b: 9, 12
>
> 'It is ironic that the late twentieth century has seen a renaissance of rural history.'
> Magagna 1991: 1

In the quarter of a century since the collection of papers published as *Problèmes de la terre en Grèce ancienne*, and under the influence of M.I. Finley's own *Ancient Economy* (first published in the same year), research into many of 'the most fundamental aspects of ancient society' has been vigorously renewed in the area of classical antiquity as part of a wider 'renaissance of rural history'.[1] Academic interest in the agrarian dimension of ancient civilisation is not without parallel. The work of N.D. Fustel de Coulanges (1830-1889) and Max Weber (1864-1920) in the later nineteenth and early twentieth centuries stimulated research in this area,[2] at a time when rural economies in the USA and several European countries were undergoing significant transformation.[3] It therefore seems appropriate to review the reasons for the popularity of nineteenth-century agrarian inquiries to which Paul Guiraud (1850-1907) contributed with his *La propriété foncière*

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[1] See Humphreys 1978: 113. Only a decade ago, a leading practitioner of survey archaeology could state, 'that to recover any small part of the history of the rural landscape of ancient Greece would be to break almost entirely new ground.' (Snodgrass 1987: 131). On the current the popularity of 'rural history', see Merricks 1996; Turner 1997, who interpret such research directions (including the founding of a new journal, *Rural History*, in 1990) as part of a recent upsurge of interest in 'environmental history'. *cf.* the optimism of Wrigley 1991: 120 concerning urban history, 'at the start of the nineteen-nineties [it] may be said to be in the very bloom of youth.'

[2] Momigliano [1982] 1994: 244, 'Agrarian inquiries were altogether fashionable in Europe in the last decades of the nineteenth century.' Also Momigliano [1954] 1994: 35 on the 'new school of research on Hellenistic and Roman history that developed in Germany towards the end of the last century. This school emphasized the importance of regional administrative and agrarian history...Max Weber, later to become the greatest German sociologist, was behind the new interest in agrarian history.' Honigsheim 1946, 1949 for the importance of Weber's contribution to rural history. See Finley 1985b: 88-89 (also Love 1991: 35-41) for an acknowledgement of Weber's *Agrarian Sociology of Ancient Civilizations* [*Agrarverhältnisse des Altertums*].

[3] For the 'Great Depression' in late nineteenth-century British agriculture, see Fletcher 1961. Ó Grada 1994: 146 takes a less pessimistic view, while acknowledging its existence. For attitudes to the countryside at this time, see also Shipley 1996: 1. Ross & Tontz 1948 critically review the American social, mechanical and financial 'agricultural revolution' which is considered to have occurred in the USA between the Civil War and the First World War. Overton 1996: 7-9 for discussion of the criteria constituting an 'agricultural revolution.'

en Grèce jusqu' à la conquête romaine.[4] Furthermore, by assessing the intellectual history of agrarian inquiry since Guiraud, and considering the subsequent role which individual contributions to *Problèmes de la terre en Grèce ancienne* have played in shaping research questions concerned with the economic geography of ancient rural Greece, I seek to demonstrate the extent of their respective influence in approaches taken to the case study.

THE TRADITIONS OF RESEARCH

The subjects of land use, labour, settlement and territory in classical antiquity were not new at the time when Guiraud produced his study of landed property in ancient Greece. Over a century before, Adam Dickson's *The Husbandry of the Ancients* had collected and discussed agrarian references made by ancient authors, devoting a long chapter to the question of ancient labour, and commenting on subjects such as crop cultivation, manuring and drainage. August Boeckh's pioneering *Staathaushaltung der Athener*, published thirty years later, contained an antiquarian collection of literary references concerning the agriculture of classical Athens.[5] However, Dickson's study was grounded in practical experience of agriculture, and his purpose in collecting ancient literary sources was explicitly didactic rather than antiquarian, and bordered on the philanthropic according to his own stated motives,

> 'Although its is supposed that agriculture and all other arts are brought to great perfection in the present age, yet I am persuaded, that all who consider the attention, genius, and knowledge of the ancients, and particularly of the Romans, will be convinced that something useful and important may be learned from a knowledge of their practices in husbandry. The design of the treatise is to give as full an account of these as can be obtained from their authors on the subject, and to apply them for the improvement of modern agriculture. I propose likewise to compare the practices of the ancients with the most approved practices of the moderns. For this comparison, it will probably appear evident to all, that if, in the knowledge of the theory of agriculture, the ancient farmers are inferior to our modern improvers, yet, in attention to circumstances and exactness of execution, they are greatly superior.'
> Dickson 1788: 18-19

Agricultural location theory had been developed by J.H. von Thünen in the early nineteenth century.[6] However, although his model of a small, agricultural state consuming its produce in isolation may have ultimately derived inspiration from Plato, his influence upon scholarship of the ancient world is more demonstrable in geographical theory of the twentieth century than in the

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[4] The intellectual heritage of Guiraud in recent scholarship is most clearly acknowledged in Rougemont 1991: 133, 'monument de clarté et de prudence critique, très complet à sa date, toujours indispensable.' Also Burford 1993: ix-x, 13-14; Hanson 1995: xi-xii.

[5] Boeckh [1818] 1828: 57-65.

[6] von Thünen 1826. See now O'Kelly & Bryan 1996.

scholarship of nineteenth-century Classics. Inquiries into ancient populations, which themselves were based upon geographical study of state territories and agricultural production, had already received attention from K.J. Beloch.[7] German scholars, under the influence of E. Curtius, had also produced brief investigations into typologies of ancient settlement,[8] and the representation of rural people in ancient literary sources.[9] However, it was with Fustel de Coulanges that inquiry into the *interrelation* between land ownership and society became central,[10] fuelled by contemporary political debate between socialist movements and their opponents which provided a further spur to agrarian historical inquiry.[11] This interest was continued by his favourite pupil in Paris, and it was with Guiraud that 'the economic aspect of the school of Fustel [was] particularly marked.'[12]

Institutional in title, *La propriété foncière en Grèce jusqu' à la conquête romaine* nonetheless contained the first systematic analysis of the economic geography of ancient Greece, albeit only after extensive discussion of institutional matters.[13] The work was produced at,

> 'a time which saw the publication of many fundamental and innovative works in the field of Greek history...Men with original minds and realistic vision, interested in fundamental problems of religion, law, economy, and anthropology, and at the same time committed to refined techniques in the editing and interpretation of texts, were taking charge of Greek history.'
> Momigliano [1957] 1994: 60

However, the scope of Guiraud's *magnum opus* was different from the near contemporary works of ancient Greek history by scholars such as E. Meyer, K.J. Beloch, and G. Busolt, and instead bore closer comparison to Robert von Pöhlmann's *Geschichte des antiken Kommunismus und Sozialismus*, first published in the same year (1893) as Guiraud's work, and re-titled

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[7] Beloch 1886: 29-33; Myers 1953: 175-176 for a review of the historiography of the 'population question' from David Hume onwards.

[8] Hirschfeld 1884.

[9] Ribbeck 1888.

[10] Fustel de Coulanges 1889; Momigliano [1982] 1994: 224.

[11] e.g. the respective anarchist and socialist works of the time by Proudhon (1840, 1848, 1866) and Engels 1884 (see Schlatter 1951: 272). It is within this social context that Fustel de Coulanges engaged in, 'a polemic against socialist and generally egalitarian ideas', throughout his career (Momigliano 1980a: xi). Vigorous resistance to agrarian collectivisation is evidenced in the publication of Henry 1895, the foundation of the Société des Agriculteurs de France, and the publication of the journal *La Petite Propriété* in 1896. For the general background to agrarian history in modern France, see Griswold 1948: 86-127. See also Finley 1980: 49 for French and German academic reaction to socialism in the late nineteenth- and early twentieth century. N.B. Heitland's acknowledged reason for writing *Agricola*: an expressed reaction against contemporary socialist theory (Heitland 1923: 1).

[12] Momigliano [1977] 1994: 163. See especially Guiraud 1893: 30-32 for his own acknowledgement of the influence of Fustel de Coulanges. *cf.* Girard 1908: 85 noting the testimony of peers in the 1907 necrologies published in *Revue Historique* and *Société des Études Grecques*, 'Élève préféré de Fustel de Coulanges, il [Guiraud] avait voué à son maître un véritable culte et il prit à tâche d'appliquer sa méthode à ses propres travaux.'

[13] Book III Chapter 5 (*L'agriculture hellénique*), Chapter 6 (*Productions du sol*).

Geschichte der sozialen Frage und des Sozialismus in der antiken Welt in later editions.[14] Devoting chapters to 'socialist theories' and 'practical socialism' in ancient Greece,[15] Guiraud's stated intention was to learn whether the origins of land ownership in ancient civilisations lay in 'primitive communism' or individual property holding.[16] The purpose of Pöhlmann's enterprise was 'to serve, in the final analysis, as a warning to his contemporaries and to demonstrate the dangers inherent in the communist and socialist movements in Germany of his day.'[17] Guiraud's concluding remarks, concerning the relationship between the history of ancient Greece and contemporary experience, contrasted with the determinism of Pöhlmann,[18]

> 'Il ne serait pas moins imprudent d'y chercher l'annonce anticipée des destinées que la propriété foncière est appelée à avoir en France et en Europe. Si la Grèce a péri par le socialisme agraire, il n'en résulte pas que nous soyons condamnés à subir un sort pareil.'
> Guiraud 1893: 636

His most distinctive contribution was the addition of a sociological dimension to the analysis of Greek history: the distinctive feature of ancient Greek society, according to Guiraud, was the predominance of 'rural life',

> 'Le trait caractéristique de l'ancienne Grèce fut la prédominance de la vie rurale. Les villes n'étaient guère que des lieux de refuge où l'on courait s'enfermer en cas d'invasion ennemie; c'est là aussi que se tenaient les marchés, que siégeaient les pouvoirs publics, que se célébraient les fêtes nationales. Mais le gros de la population n'y résidait pas; les nobles eux-mêmes ne s'y rendaient qu'accidentellement, et ils passaient presque toute leur existence sur leurs terres. Ils n'habitaient pas l'hiver à la ville, et l'été à la campagne. Thucydide indique nettement que chacun avait, durant toute l'année, son domicile effectif dans les champs.'
> Guiraud 1893: 69

Although the literary evidence which Guiraud cited to support his assertion was drawn exclusively from Thoukydides and referred primarily to Attika,[19] the emphasis upon the nature of land use and its relationship to warfare,[20] social structure and settlement patterns in Attika and

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[14] Guiraud's book generally received favourable reviews from specialist epigraphers, e.g. M. Dareste (1895) *Journal des Savants*: 491-500, and historians, e.g. G. Fougères (1896) *Revue historique* **3:** 331-332. The manuscript had been awarded the 1890 Bordin prize by the Académie des Sciences Morales et Politiques. G. Glotz (1901) *Revue historique* **3:** 392-397 in his review of Guiraud's later *La main-d'oeuvre industrielle dans l'ancienne Grèce* felt it 'deserved to sit alongside' *La propriété foncière*.

[15] Book IV Chapter 1 (*Les théories socialistes en Grèce*), Chapter 2 (*Le socialisme pratique en Grèce*).

[16] Guiraud 1893: 1; Guiraud 1905: 67 (*cf.* Ridgeway 1885).

[17] Fuks 1974: 52.

[18] Finley 1980: 51.

[19] Of the ancient sources to which Guiraud 1893: 69 refers, Thoukydides II.16 relates to Attika, with particular reference to the situation of Athenians at the outbreak of the Peloponnesian War. Thoukydides I.5.10 refers in a rather idealised (and not strictly historical) manner to the types of 'scattered settlements' which pirates might attack at an unspecified time in the past. Thoukydides III.94 refers to a non-*polis* community of the period (the Aetolian *ethnos*).

[20] Guiraud 1893: 614.

other regions remains a lasting influence,[21] as was the insistence on the dominance of agriculture as the economic basis of the *polis* (which Guiraud's biographer, P. Girard attempted to explain in terms of his rural upbringing),[22]

> 'Mais dans tout le Péloponèse, dans la Grèce centrale, et même dans la plupart des îles, c'était la production agricole qui dominait. S'il était possible de comparer la somme de richesse que fournissait l'exploitation du sol avec celle que l'on tirait du trafic et de la spéculation proprement dite, on verrait sûrement que la première était de beaucoup la plus considérable...Encore ne faut-il pas oublier que dans toutes ces places le travail industriel et commercial était à peu près monopolisé par des étrangers.'
> Guiraud 1893: 595

The absence of lengthy discussion concerning labour in Guiraud's work has been noted,[23] although for its time, and given the institutional focus of the book, this was by no means unique.[24] Nonetheless, the importance of Guiraud's work was acknowledged in the following generation of French scholarship, most notably by Auguste Jardé in *Les céréals dans l'antiquité grecque*,[25] itself the starting point for recent quantitative re-examination of the agricultural productivity of Attika.[26]

However, among contemporary English language scholarship of the early decades of the twentieth century, Guiraud's influence is less apparent than that of a growing body of geographical work, characterised by its interest in resource-orientated geography, and the relationship of man and the physical environment; practitioners variously coined such approaches 'historical geography', or 'geographical history', the existence of both terms perhaps symbolic of ambivalence concerning historical causality attached to human or environmental factors.[27] In the first half of the

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[21] e.g. Finley 1981: 1; Osborne 1985a, 1987; Lohmann 1993a.

[22] Girard 1908: 4, 'Il avait gardé de cette vie paysanne un charmant souvenir, qui devait se raviver plus tard...et transparaître jusque dans ses travaux: tel chaiptre savoureux et neuf de la *Propriéé foncière*, sur l'agriculture chez les Grecs, se rattache peut-être à ces années lointaines et à ce goût de la terre, qu'il eut toujours.' Guiraud's father was a teacher from Villemagne, 5 kms from Cenne, but the family had traditionally been dairy and vegetable farmers, supplemented by the artisanship of clog making in the winter months (Girard 1908: 3).

[23] Finley 1980: 51, 'slavery receives two pages, helots fourteen.' However, Guiraud's work was a prominent reference point in Barbagallo's 1905 Marxist analysis of Greek history, which paid close attention to the question of slavery and agricultural labour in Greek antiquity in Chs.1-2 of Vol.I ('*La schiavitù et l'antica società ellenica*' and '*Le Società agricole et la servitù della gleba in Grecia*').

[24] Finley 1980: 40-41 for the limits of Marx and Engels' interest in ancient labour, 'Profound as Marx's interest was in the historical process, at no time did he (or Engels) attempt a study of ancient society or the ancient economy.'

[25] Jardé's opinion of Guiraud's influence on his own work (Jardé 1925: xiii) is worth noting in full, 'Parmi les histoires générales qui incidemment traitent des questions agricoles et les très nombreuses études de détail que j'ai lues pour en utiliser et citer quelques-unes dans mes notes, je dois faire une place à part au livre magistral de Guiraud sur la propriété foncière en Grèce, rappeler combien il m'a fourni de documents déjà mis en oeuvre et dire comment il a été pour moi évocateur d'idées.'

[26] Garnsey 1988; Sallares 1991; Murray 1992. Jardé 1925: xvi recognised the hypothetical nature of his own work, 'En terminant cette introduction, où j'ai voulu indiquer les difficultés de l'information et l'incertitude des méthodes, je crois devoir insister sur le caractère hypothétique des déductions et des résultats.' What is noteworthy is Jardé's readiness to use comparative geographical information as the basis of his study (see below p.30).

[27] Marsh 1864; Freeman [1881] 1903: 1-5; Ratzel 1882, 1891; George [1901] 1924; Vallaux 1911 were early contributors whose work continued to spark debate in the 1920's. Myers 1953: 105 attempted to define the terms,

twentieth century, J.L. Myers, M. Cary and E.C. Semple produced works that stressed the fundamental importance of the Mediterranean landscape in ancient history.[28] The works of Semple and (perhaps to a lesser extent) Cary,[29] which drew on aspects of environmental determinism present in some classical sources to support their arguments, positioned them among the school of environmental 'anthropo-geographers' influenced by F. Ratzel.[30] Such an approach was not universally accepted at the time: 'Ratzelians' were subject to an extensive critique by Lucien Febvre (working in the sociological tradition of Émile Durkheim) for their geographically deterministic interpretation of human history.[31]

Simultaneously, an alternative approach was promoted by Alfred Zimmern (1879-1957) in his 1911 publication *The Greek Commonwealth*, and his 1928 collection of essays on Greek history, *Solon and Croesus*. Most notably, the essay, 'Suggestions Towards a Political Economy of the Greek City-State', anticipated arguments put forward by J. Hasebroek in *Trade and Politics in Ancient Greece*, and M.I. Finley's *Ancient Economy*.[32] Zimmern's own synthesis of geographical and historical methods paid little attention to Ratzel, but instead built on the work of Myers,[33] the Belgian historian H. Francotte,[34] and the German geographer A. Philippson,[35] and analysed the

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'Geography is the study of the distribution of processes rather than of situations...people sometimes speak as if history only became geographical, and geography historical, at their latter and more complex ends.'

[28] Myers 1953 (including work which dated from the early twentieth century); Semple 1932; Cary 1949. See Shipley 1996: 4.

[29] e.g. Herodotos IX.122. [Hippokrates] *Airs, Waters, Places* 24. See Hughes 1975: 120-1; also Hall 1997: 6-8.

[30] Ratzel 1882, 1891. (For precursors of Ratzel, see Collingwood 1994: 89-92). A similar approach may also be discerned in the works of Huntington 1915 and Gwynn 1918.

[31] Febvre 1925: 89-90, 'It is not true that four or five great geographic influences weigh on historic bodies with a rigid and uniform influence; but at every instant and in all phases of their existence, through the exceedingly supple and persistent mediation of those living beings endowed with initiative, called men, isolated or in groups, there are constant, durable, manifold, and at times contradictory influences exercised by all those forces of soil, climate, vegetation—and many other forces besides—which constitute and compose a natural environment.' (Febvre 1925: 22, 33 acknowledges his debt to Durkheim and the influence of *l'année sociologique* upon human geography). Also George 1924: v, 'I only profess to call attention to the modes in which geography influences history...For an opposite reason I do not care to dwell on the influence of geography upon human character. Man's environment no doubt may tell in various ways on his character, but so do many other influences.' For a recent restatement of this view, Gosden 1994: 180. See Unwin 1992: 92-94 on the debate between 'determinists' and 'possibilists'.

[32] Zimmern 1928: 165-199.

[33] Myers had spoken in 1910 of his vision of an ideal historical method where one could, 'watch literary achievement accumulating on one hand, and potsherds, cultivation terraces, alluvial coastlines, piling up on the other; to feel the pulse and listen to the cries of infant genius, and to construct a history which should be autobiography and ethnology in one.' (Myers 1953: 52-3). Zimmern 1928: 165 had already observed on the history of the discipline, 'Even when it became evident that literature and art could not be satisfactorily studied apart from the social and political conditions out of which they arose, ancient history was slow to disengage itself as a separate and independent subject. Scholars tended to regard it as merely ancillary to the study of literature, and it was relegated too often to the footnotes of editions of classical authors.'

[34] e.g. Zimmern 1931: 230 n.2 citing with approval Francotte 1901: 53 on the agrarian nature of ancient Greek civilisation.

[35] Zimmern 1928: 191, 'The economic significance of his [Philippson's] results has not been sufficiently appreciated.' *viz.* Part I ('Geography') of *The Greek Commonwealth* which comprised sections entitled 'The Mediterranean Area/The Sea/The Climate/ The Soil.

economic geography of the *polis* in the wider context of the ancient economy debate (the 'Bücher-Meyer controversy').[36]

Eschewing contemporary sociological research which tended to focus upon the city as an exclusively urban phenomenon,[37] Zimmern re-stated the Guiraudian maxim that the rural sphere was the sociological key to understanding ancient Greek society,[38]

> 'Greek civilization is, in a sense, urban; but its basis is agricultural, and the breezes of the open country blow through the Parliament and the market-place. The landed tradition is the strongest and most persistent force in the inherited social economy of Greece.
> It is necessary to emphasize this in order to understand to the full how fundamentally different their economy is from ours. It is not our cloistered Hellenists and city-dwellers but our shepherds and yokels who, in their daily occupations and habits of housekeeping, touch most nearly the ancient Greek...The Greeks, being by tradition shepherds and farmers, were brought up conservatives.'
> Zimmern 1931: 230-1

Zimmern, however, more than anyone previously, was to bring together the methods of geographical analysis with an understanding of the economic importance of the countryside of a *polis*. Although making a distinction between geography and economics, respectively the 'products of the earth', and 'the use man makes of them',[39] Zimmern did not enter into detailed examination of the question of labour which this distinction suggested, but instead concentrated on establishing the nature of the ancient economy, and the vocabulary which could be used to describe it.[40] Zimmern's fundamental argument, which inevitably brought to bear on the Bücher-Meyer

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[36] K. Bücher's *Die Entstehung der Volkswirtschaft* was first published in 1893, the same year as Guiraud and von Pöhlmann's works. For the 'Bücher-Meyer controversy', see collected papers of Bücher, Meyer and Beloch in Finley 1979 (also Finley 1981: 3-23; Bruhns 1985). It is unfortunate that Zimmern's ideas find no place in these historiographic discussions, especially since Finley did appear aware of his work (see below n.80).

[37] e.g. Park, Burgess & McKenzie 1925. Spengler 1928: 90-91, 95 delineated a 'spiritual' dimension to the urban centre of an ancient city 'from which the countryside is henceforth regarded, felt and experienced as "environs" as something different and subordinate...World history is city [urban] history.' For Spengler, whose *Decline of the West* was highly influential during the inter-war period, the detachment of the city from the country was 'the determinative form to which the course and sense of higher history generally conforms', and cited the Classical world as an 'obvious case in point' (Spengler 1928: 95; *cf.* Martindale & Neuwirth in Weber 1958: 36). Sociological urbano-centrism is also implicit in Mumford 1961: 568, 'In taking form, the ancient city brought together many scattered organs of the common life, and within its walls promoted their interaction and fusion.'

[38] Thus Zimmern 1928: 60-63 for the influence of the emergent discipline of Sociology — implicitly Weber, although he is not stated by name — on his own work. Zimmern was a Lecturer in Sociology at the London School of Economics from 1910-1911 (Zimmern *MS.* 12 fol.163). Also Turner 1981: 259-260, 262 for the influence of Graham Wallas' social psychology theories upon the formulation of *The Greek Commonwealth*.

[39] Zimmern 1928: 55.

[40] The nexus of 'Land and Labour' as a topic of discussion in many subsequent publications is traceable to Heitland 1923: 7-15, as indeed is the essence of the remark attributed to A.H.M. Jones by Finley 1985b: 27 (*cf.* Heitland 1923: 3, 'unluckily statistical record of a scientific nature is not available for the times that we call ancient'). Zimmern's reluctance to deal with the subject in detail may be explained by his robust opposition to the, 'baleful influence of Karl Marx', whom he later dismissed as, 'half prophet, half pedant and wholly wrong-headed' (Zimmern 1947: 8).

controversy, was that, 'Greco-Roman society was always predominantly and fundamentally agricultural in character; and its agriculture was agriculture for consumption rather than for sale.'[41]

For Zimmern, this had several important consequences for the understanding of ancient Greek history; consequences that appear to have influenced subsequent historians, although he is rarely, if ever, credited.[42] In a critique of both Bücher's 'household economy',[43] and Meyer's modernism,[44] he firstly argued for the essential 'otherness' of the ancient economy, stating the need 'to get behind the Industrial Revolution', and refuting the suggestion that 'the blood of "economic man" ran in their veins'.[45] A similar idea was also propounded independently by W.E. Heitland in his *Agricola* of 1923,[46] but Zimmern's criticism broached both the theoretical models *and* the vocabulary which had been employed in the debate. In several respects, the tone and content prefigured E. Will's 1954 'Trois quarts de siècle de recherches sur l'économie grecque antique', and Finley's introduction to *The Ancient Economy* (in neither of which was made any mention of Zimmern's work).[47]

Guiraud had separated two distinct influences — the 'political' and the 'economic' — which he perceived as crucial to his study.[48] Zimmern, however, by arguing that the use of vocabulary such as 'economic development' would be misplaced with regard to the Greek city-state,[49] anticipated

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[41] Zimmern 1928: 181.

[42] e.g. Bolkestein 1958: 21, 'The Greek town came into existence as the centre of consumers, not producers, and it has never lost its rusticity nor the character of the centre of consumption, not even Athens.' Zimmern's work is not cited in Humphreys 1978, nor Finley [1973] 1985a, despite the similarity of his arguments.

[43] Zimmern 1928: 169, 'That this theory should ever have been seriously held is a remarkable illustration of the dangers of specialism.'

[44] Zimmern 1928: 170, 'He appears to have fallen from one extreme into another.'

[45] Zimmern 1931: 223-225.

[46] Heitland 1923: 1.

[47] Zimmern 1928: 166-167, 'And so economic arguments and economic assumptions have crept almost unconsciously into our books on ancient history and our interpretations of classical authors...All the vocabulary of the modern economic historian — capitalism, markets, imported labour, unemployment, the pressure of population upon subsistence — has made its appearance in their pages...For though economics has entered into our conception of ancient history, it has entered in as a step-child, and no proper place has yet been made for it. It is useless to argue about a theory until we are in a position to define the terms in which it is expressed. This has never yet been done for the economics of antiquity.'

[48] Guiraud 1893: 595.

[49] Zimmern 1928: 195-196, 'It is quite true that historical conditions are in constant change and movement. No single community and for that matter no single man is the same from one day to the next. But we have no right to assume that this change or movement necessarily marks either development or decadence, any more than we have a right to assume that the vagaries which may be indulged in by the economic men, and which are so disturbing in our application of economic reasoning, necessarily mark any moral or economic progress or regress. To speak then of the history of the development of the Polis Economy...is to make an unjustifiable assumption.' The same idea appears as a central part of Pleket 1973: 36, 'The whole concept of "economic growth" in a marginal agrarian society may well be misleading rather than illuminating. "Growth" may well have been merely a function of demographic expansion and may well have expressed itself in the enlargement of the cultivated area rather than in the improvement of the yield of that area or of the ratio between profit and investment.'

the inter-relationship of 'political' and 'economic' concepts expressed in Humphreys' work.[50] In addition, his reference to a model of the 'normal' city-state also appears to adopt the Weberian ideal type later popularised by Finley.[51]

Secondly, Zimmern attempted to articulate qualitative distinctions within the ancient Greek countryside based on the modalities of agricultural production: the ancient rural landscape could be ordered according to categories of 'the unproductive, the forest, the pasture, and the cultivable.'[52] Such differentiation and gradation of the countryside was *vertical* in order, 'these divisions start from the highlands and pass gradually down into the plains.'[53] Incorporating this geographical dimension in his analysis of the Greek city-state,[54] Zimmern laid new emphasis upon the economic geography of the ancient Greek countryside, and acted as an inter-disciplinary link between institutional-historical, geographical and anthropological approaches.[55] While the geographical-historical tradition of Philippson inspired continued research into the *polis*,[56] Zimmern's immediate influence on scholarship in the first half of the twentieth century would appear limited.[57] This phenomenon is only partially explainable in terms of reaction against his tripartite evolutionary model of the *polis*,[58] and Zimmern's own move away from academic to political and diplomatic circles following the First World War.[59]

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[50] Humphreys 1978: 141. Zimmern's ideas on the role of warfare in the ancient economy (Zimmern 1928: 182-185) bears close comparison to Humphreys 1978: 159-174.

[51] Zimmern 1928: 199, although N.B. Millett 1991: 247 n.24, 'Zimmern's work stoutly refuses classification as primitivist, modernist, Weberian, or anything else.'

[52] Zimmern 1931: 43-44.

[53] Zimmern 1931: 44. *cf.* Snodgrass 1987: 73; Rougemont 1991.

[54] Zimmern 1928: 199.

[55] The brief programmatic statement urging a comparative Mediterranean anthropological method (Zimmern 1928: 172) is fascinatingly elusive, since it is not elaborated elsewhere.

[56] Kirsten 1956; Kirsten & Kraiker 1967. Bintliff 1994a: 14 for the relative neglect of German historical geography in classical studies.

[57] Bolkestein [1923] 1958: vii is a notable exception.

[58] Zimmern 1928: 188, 'As regards economic organization, the *Polis* is a half-way house between the unwalled village that preceded it and the territorial monarchy that followed it.' Gernet 1933; Gomme 1937: 42-66; Will 1954 (reviews of the ancient economy debate following Hasebroek's publication) conveniently illustrate the contemporary neglect of Zimmern's publications. See also n.80 below for the neglect of Zimmern's work on ancient slavery (founded on a comparative approach which investigated the question in the light of research by economic historians of the American South, anticipating M.I. Finley).

[59] Zimmern held a Tutorial Fellowship in Ancient History at New College, Oxford from 1904-1909, and the Wilson Professorship of International Politics at Aberystwyth 1919-1921 before his close involvement (in an advisory and teaching capacity) at the League of Nations in Geneva in the 1920's (*D.N.B. 1951-1960*: 1096-1097; Symonds 1991: 68). Invited on to the 'Round Table' (an influential British policy committee including politicians and civil servants) after W.W.I, Zimmern helped spread the new concept of 'Commonwealth' in place of Empire in the 1920's (Symonds 1991: 68), as well as writing several books concerning the situation of Britain, Europe and the embryonic League of Nations in the 1920's (Zimmern 1922, 1924, 1926; see now Markwell 1986) before returning to the new Montague Burton Chair of International Relations at Oxford between 1930-1944. His knighthood in 1936 was awarded for his contribution to both academic and diplomatic service (Zimmern *MS*. 37).

The answer may be found in the wider intellectual climate: in the period before the Second World War (and for a decade afterwards), and despite Heitland's publication, British historical scholarship remained firmly preoccupied with agrarian matters of an institutional nature, derived from the poetry of Hesiod,[60] and Solon,[61] and the *Laws* of Plato. When W.J. Woodhouse devoted a monograph to Solon sub-titled *A study of the agrarian problem in Attika in the seventh century*, questions (not themselves new) concerning the alienability of land,[62] inheritance,[63] and the historicity of the *seisachtheia* were to occupy much of the subsequent discussion,[64] which focused almost exclusively upon Archaic and Classical Athens and the countryside of Attika.

Academics who studied agrarian history during this time tended to be avowedly 'interdisciplinary' (if not outright eclectic) practitioners of research, for example Zimmern (as was noted above), sociologists such as Max Weber, or the emerging '*Annales*' school of Marc Bloch and Lucien Febvre which incorporated anthropological, sociological, geographical and comparative historical approaches. Text-based ancient historians, still primarily philological in outlook, only appeared interested in rural social history when 'political history' (for example the 'reforms' of Solon) was at stake.[65]

The only notable attempt from the 1930's to integrate questions concerning land use and the ancient economy appears to be the 1937 study by H. Mickwitz, 'Economic Rationalism in Graeco-Roman Agriculture'. However, the study concentrated almost exclusively upon Roman literary sources (despite its title), with no discussion of archaeological evidence. Mickwitz concluded that, 'there was, from an economic point of view, no such rationalism in ancient farming'.[66] Indeed the enduring importance of Mickwitz's work in historiographical terms was the stimulus it provided a graduate student at Columbia University, M.I. Finley, to extend the horizons of his research beyond

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[60] e.g. Burn 1936.

[61] Woodhouse 1938.

[62] e.g. Asheri 1963; Andrewes 1967: 97; Finley 1968. The inalienability of land had been a central tenet of Fustel de Coulanges' *Cité Antique* ([1864] 1980: 62). See now Isager & Skydsgaard 1992: 126-128; Burford 1993: 31-55.

[63] See Lane Fox 1985 for a summary of the debate.

[64] e.g. Forrest 1966 Ch.6. Gallant 1982b (including historiography of the debate) and Manville 1990: 27-34 have subsequently developed anthropological approaches to the institutional question of land tenure in Archaic Attika.

[65] The comments of Collingwood 1939: 81-82, concerning the relation between 'archaeology' and 'history' in Oxford during the early decades of the twentieth century, is still instructive, 'Sir Arthur Evans, early in the century, had begun to give a brilliant example of the new method by unearthing and reconstructing the long history of Bronze Age Knossos. The official reaction of Oxford was to cut out of Greek history...everything down to the first Olympiad.'

[66] Mickwitz 1937: 589, followed by Finley 1985a: 117, 'Investment in land, in short, was never in antiquity a matter of systematic, calculated policy, of what Weber called economic rationality.' Also Finley [1965] 1981: 188 for 'cheese pairing, not economic rationalism' in the agricultural strategies of ancient landowners (*cf.* Pleket 1973: 30-33).

ancient Greek 'business problems' and away from more formal analysis of economic rationality, as much as the substance of the original argument.[67]

The general direction of study in this period may be part of what Michael Jameson has characterised as the tendency for Classics (including ancient history and archaeology) to maintain 'its focus on the finest products of the civilisation' during much of the last century: rural history was thus simply not part of the history of Greek *civilisation*.[68] However, it should perhaps also be seen in a wider academic context where other historical disciplines in the twentieth century were also slow to research similar areas, until influenced by the '*Annales* school'.[69] Nonetheless, research of lasting importance (in tune with approaches advocated by Zimmern) was conducted in the 1920's and 1930's, and published in several specialist monographs.

P. Cloché, following in the French tradition of Guiraud and Jardé, provided a systematic discussion of cereal, olive and vine cultivation, together with animal husbandry (which had become a speciality of German scholars at the time) based on literary and archaeological evidence,[70] while German scholars discussed the interpretation of agrarian references in papyri from Ptolemaic Egypt.[71] The physical infrastructure of agrarian production also received attention: A.G. Drachmann published a monograph detailing the machinery used for olive processing in classical antiquity, seeking to trace a developmental history of the ancient olive press.[72] P. Grimal discussed the representation of *maisons à tour* — rural complexes which comprised a tower as the main architectural feature — in Roman paintings and mosaics, comparing them to known archaeological remains and concluding that they represented a type of dwelling typified as a *maison rustique*.[73]

However, economic rural archaeology — the archaeological exploration of a *chora* with a view to analysing productive activity — remained the province of scholars in the Soviet Union, with the

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[67] For the influence of Mickwitz's work on Finley, Shaw 1993: 192, 199. The correspondence and associated documents between M.I. Finley and Fritz M. Heichelheim, published in Shaw 1993: 189-194, however amply illustrates the predominance of institutional mechanisms in Finley's vision of the ancient economy during the 1940's (perhaps already influenced by Karl Polanyi). Money and credit appear to have been his main interest at this time (primary agrarian production barely figures in his outline of ancient economic practice contained in one résumé), while the research topic finally chosen for his 1950 doctoral dissertation (Attic *horoi*) was slowly refined over two decades (interrupted by 5 years work for a Russian relief agency during the Second World War) from a more general study of trade in the Classical *polis* (Shaw 1993: 180; *D.N.B.1986-1990:* 134-135).

[68] Jameson 1994b: 194. Also Connor 1986: 339, 'There was little room for women, slaves, outsiders, marginal people, or the oppressed, since the classical humanities looked primarily at power and those who exercised it, the male-dominated establishments of antiquity.'

[69] Chase 1992; Sheail 1993: 209; Merricks 1996: 100-101; Turner 1997: 126, 'The brutal truth is that unlike other disciplines, history, in many of its forms, has taken a long while to wake up to the importance of man within his environment.'

[70] Cloché 1931 (also Grand 1935). For German studies on animal husbandry (e.g. Keller 1909), see Isager & Skydsgaard 1992: 83.

[71] Meyer 1920; Hasebroek 1922; Schnebel 1925.

[72] Drachmann 1932.

[73] Grimal 1939.

notable exception of certain members of the American School of Classical Studies at Athens, J.H. Young and L.E. Lord. Agrarian history was a traditional Russian academic discipline (which predated Soviet rule),[74] and is evidenced by agrarian writers such as A.V. Chayanov, whose lasting influence upon the anthropology of 'peasant' economies was particularly felt outside Soviet circles.[75] Survey and excavation of the countryside of Chersonesos Taurike (a *polis* situated on the shores of the South Western Crimea) had begun in the late nineteenth century, and was continued before (and after) the Second World War by the State Chersonesos Museum in Sevastopol.[76] However, the attitude towards this kind of archaeology elsewhere is instructively illustrated by the change of direction undertaken by Michael Rostovtzeff upon his departure from Russia in 1918.[77]

Archaeology of the Greek countryside which did not follow the tradition of Colonel William Leake and seek to establish the location of an ancient battle site, or identify sites mentioned by Homer,[78] Strabo or Pausanias, was pursued in English language scholarship almost exclusively by J.H. Young between the 1930's and 1950's,[79] perhaps through general lack of interest in the subject, or because such interest in agrarian history — the archaeology of primary production, labour, social structure and rural settlement — was mistakenly considered 'Marxist'.[80]

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[74] Momigliano [1954] 1994: 37 'Agrarian history in general was a speciality of Russian historians. In a country where agrarian problems were both archaic in form and contemporary in substance, the study of the peasantry could hardly escape attention.'

[75] Chayanov [1925] 1966; Wolf 1966: 14-15. See Forbes 1982: 392-410 for a recent engagement with the Chayanov 'school' concerning household labur and agricultural production in Methana, modern Greece.

[76] Brasinskij 1968; Pečírka 1973: 141 n.1; Selov 1980: 349-350; Saprykin 1994: 3-10. Saprykin 1994: 3 notes that this work was preceded by more than a century of sporadic topographic investigation.

[77] Raskolnikoff 1975: 33-34. Wes 1990: 78. Momigliano [1954] 1994: 39, 'Agrarian history, to which Rostovtzeff had devoted so much important research when he was in Russia and in the first years of his exile, played only a secondary part in the two great histories.' For the circumstances surrounding the writing of *The Social and Economic History of the Hellenistic World*, see Wes 1990: 82-83. It remains an irony that Rostovtzeff, who argued vigorously for a 'modernist' interpretation of the ancient economy (e.g. Rostovtzeff 1936) encouraged research into economic aspects of the ancient countryside (Momigliano [1977] 1994: 32 for the novelty of Rostovtzeff's use of archaeological material), whereas discussion of primary production is absent from recent 'neo-institutional' analyses so critical of modernism (e.g. Meikle 1995a, 1995b).

[78] e.g. Bérard 1927.

[79] Young 1956a, 1956b, based on fieldwork conducted in the 1930's. For the relationship between archaeological material and historical events, Jameson 1994b: 194; Small 1994: 4.

[80] See Garlan 1988: 8-12 for the role of Soviet historians in the study of ancient slavery during the twentieth century, and the 'minimising' of the subject by Western historians before the Second World War, under the influence of Meyer (*cf.* Finley 1980: 45, 57-58). However, Garlan neglects Zimmern's historiographical review (critical of Meyer) and discussion of slavery in Greek society, first published in the *Sociological Review* of 1909 ('Was Greek Civilization Based on Slave Labour?', Zimmern 1928: 105-164) in attributing originality to Finley's comparative approach (perhaps because Finley 1980 curiously omitted reference to Zimmern). On the (mis)application of the term 'Marxism' by ancient historians, Finley 1980: 63. Unfortunately, the tradition of Soviet agrarian studies is not discussed by de Ste. Croix 1975 in his analysis of Marxism and ancient history (de Ste. Croix 1975: 35 n.3).

NEW APPROACHES TO THE ANCIENT GREEK COUNTRYSIDE

ECONOMIC GEOGRAPHY

Young's work differed from the prevailing topographic and toponymic tradition, which originated in the descriptions of the medieval geographer Buondelmonti and the accounts of European travellers, was pursued by individual explorers of the Greek countryside (usually from their bases at the American and British Schools at Athens), and was often further enriched by intimate geographical experience gained during the Second World War.[81] Young argued that many monumental rural sites (comprising of a tower and other associated structures), which had been identified in Attika, and especially the Aegean islands, formed the remains of agricultural buildings, not 'forts' or 'watchtowers',[82] since previous descriptions by early travellers and topographers were often hampered by uncritically applied military terminology, when in fact such 'fortifications', 'defences', 'citadels' and 'strongholds' might be interpreted within a domestic, agrarian context.[83]

As buildings which involved considerable application of wealth and labour resources in construction, facilitating their prominence in the rural landscape from antiquity to the present day,[84] analysis of the towers and their localities might offer specific contributions to debates over the kind and scale of rural exploitation in the landscape of a *polis*. While the architecture and site plans of numerous towers scattered throughout the Mediterranean had been published before the Second World War (often as part of topographical investigations into the hinterland of ancient *poleis*), Young initiated the first attempt to investigate the functions of a specific group of towers located within part of a polity featured the Lavrion/Sounion area of southern Attika. Siphnos was the first ancient *chora* in which such rural sites were analysed as a whole with regard to economic geography.[85]

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[81] e.g. Hammond 1954. For the use of toponyms in exploring the economic geography of ancient rural sites, Brunet 1988b: 14 (however, *cf.* Rackham & Moody 1996: 104, 107 for problems in the meaningful interpretation of local names).

[82] The work of Lord (1938, 1939, 1941) in the investigation of Argolid 'blockhouses' is probably best seen as part of the topographic tradition, since the starting point of his research was Pausanias' description of the 'pyramids'. Lord, however, was prepared to consider other agricultural functions for the buildings.

[83] Haselberger 1983: 117-8; Munn 1983: 63 n.1 on the penchant for (erroneous) identification of 'fortifications' in the ancient countryside. For 'military' interpretations, see Ross 1840: 146. For varying views on the 'espace stratégique' of a *polis*, Garlan 1974; Will 1975; Ober 1985: 1-9; 69-86.

[84] The prominence, both literally and metaphorically, of many ancient rural structures is evidenced by the degree of topographical 'myth-making' which has often surrounded these buildings in local traditions from antiquity (e.g. Pausanias X.30.4 - Timon's tower, Strabo XIII.1.22 - Hero's tower) to the modern day. For local traditions surrounding Euboian 'Dragon Houses' see Carpenter & Boyd 1977: 179. Other examples include the Tower of Princess (ὁ πύργος τῆς Βασιλοπούλας), at Kiveri in Argolid (McLeod 1962: 390; *cf.* Young 1956a: 122-4 on the 'Princess Tower' of southern Attika), Young 1956a: 126 n.7 for the 'Golden Pig Tower' at Sounion, inspiring exploratory digging, see (*cf.* digging at Dema Tower, Munn 1993: 87 n.24).

[85] Young 1956a (Attika); Young 1956b (Siphnos). For individual towers published previous to these studies, see Appendices 2-3.

The importance of the Chersonesos Taurike excavations was to show that monumental architecture could form part of a domestic, agrarian complex in an apoikic context. However, the extent to which the relationship of Chersonese towers to land ownership, use and settlement is directly applicable in other areas of the Mediterranean, especially where the division and distribution of land were not the result of a colonising movement, is more contentious.[86]

Young's thesis was later followed by scholars in Eastern Europe working in Marxist intellectual traditions (most notably T. Zawadzki and J. Pečírka).[87] Since then, studies of individual tower sites have expanded the number of known structures in the Mediterranean area as well as contributing to the continuing debate which concerns the relationship of towers to ancient populations and land use. Directed primarily at gaining a clearer understanding of the motivations behind their construction and attempting an explanation for their individual location and collective distribution, studies of monumental rural sites have become more sophisticated in their attempts to establish meaningful typologies and criteria for analysis, and thus assist understanding of the relationship between site architecture, location and distribution.[88]

Nonetheless, the topographic tradition (identification of roads, routes, passes, borders and 'forts' according to literary and epigraphic sources) continued to exert a strong influence upon research into the ancient countryside, most notably within the scholarly orbit of the American School of Classical Studies — in no small part due to Eugene Vanderpool,[89] and to W.K. Pritchett's *Studies in Ancient Greek Topography*.[90]

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[86] See comments of Jameson in Wells 1992: 172 on differences between apoikic and non-apoikic land and its social implications.

[87] Zawadzki 1959-1960: 126, 'L'agriculture de la Grèce antique fait partie d'un travail plus ample, traitant de l'ensemble de l'économie rurale de la Grèce antique et englobant, outre l'agriculture, l'élevage et la transformation des produits du sol...Dans divers lieux du monde grec, les fermes de ce genre étaient pourvues de caractéristiques bâtiments d'exploitation, découverts et interprétés à la suite des recherches archéologiques exécutées au cours de quelques dizaines d'années dernières. Ces bâtiments avaient la forme d'assez haute tours (πύργοι) et servaient en même temps de logement pour le personnel, de magasin, et même comme établissement destiné à la transformation des produits agricoles. On ne construisait pas de bâtiments de ce genre dans des propriétés plus petites; néanmoins, on connaît assez bien leur équipement grâce aux inventaires de Delos.' *cf.* Pečírka 1973.

[88] The substantial bibliography relating to tower studies in the Mediterranean has been incorporated as far as possible into tabulated information (see *Vol II.* Appendices 2-3) in order to allow comparative discussion of Siphnian towers in the main text.

[89] e.g. Vanderpool 1978. Meritt 1984: 99, 105-106 on the influence of Vanderpool within the American School of Classical Studies.

[90] See especially the work of Eliot 1962; McCredie 1966; Ober 1985; Camp 1991; Munn 1993. The work of Michael Jameson, and his influence in directing the southern Argolid Project, offers an important contrast to recent American, military topographic approaches. There is a danger that the core of much research of this nature is narrowly Atheno-centric in scope, e.g. Munn 1983: 8; 1993: 16-25, *contra* the basic thesis of Ober 1985 (both authors concentrate upon evidence from the borders of Attika in their tower studies to the virtual exclusion of other comparative material).

Another consequence of reconnaissance activity in the Second World War was the significant development in the cartography of the Greek countryside.[91] Aerial photography provided a new tool for research, with J.F. Bradford's 1957 *Ancient Landscapes* illustrating the possibilities of chorography.[92] Patterns of field divisions and variations in the intensity of land use (such as terracing on slopes) could now be identified, although questions of chronology remained to be resolved.[93] The identification of 'farmsteads' in Asia Minor by G.E. Bean and J.M. Cook in the course of their topographic researches reflected this new interest in economic geography.[94] Most excavations still undoubtedly favoured urban locations,[95] but the excavation of agricultural sites in the *chora* of Chios,[96] and a rural building in Attika,[97] offered perspectives on domestic architecture beyond the walls of the *asty*, as well as agricultural production and storage.

If Guiraud and Jardé had offered a link to rural production from the purely political and institutional, and Zimmern a link from the rural landscape to the ancient economy, work which emerged in the 1950's and continued in the 1960's marked changes in assumptions about the socio-economic structure of the *polis*, especially evident in the work of Finley.[98] Adopting a modified version of the Hasebroek position on the ancient economy,[99] and re-stating the importance of the *chora* as the economic base of the *polis*, Finley's approach from the 1960's began to diverge from the 'institutional' analysis of Karl Polanyi, and was sensitive to the contributions which epigraphy, and archaeology (though with some reservations),[100] could make to social as well as institutional aspects of agrarian history.[101]

Indeed the 1960's marked a renaissance in the ancient social history of the rural Greek world, among an international generation of scholars (occasionally working in relative isolation, such as

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[91] Supplemented by the revised Naval Intelligence guide (Admiralty Hydrographic Office 1944) which also provided a useful collection of geo-economic information.

[92] N.B. the use of aerial photography featuring Attika in Zawadzki 1959-1960: 111.

[93] Bintliff & Snodgrass 1985, 1988 for Boiotia; Schaus and Spencer 1994 for terraces on Lesbos.

[94] Bean & Cook 1955, 1957.

[95] Snodgrass 1987: 67; Shanks 1996: 50.

[96] Boardman 1956, 1958-9; Yalouris 1976: 201-205.

[97] Jones, Graham, Sackett 1973.

[98] Finley 1952, 1965.

[99] Hasebroek 1933.

[100] e.g. Finley 1975: 87-101, the essay entitled 'Archaeology and History', which expressed qualified support (together with a degree of impatience in asking useful historical questions) towards contemporary archaeological practices.

[101] Polanyi's institutional approach is cited by Humphreys 1978: 35-36, 'Process and institutions together form the economy. Some students stress the material resources and equipment — the ecology and technology — which make up the process; others, like myself, prefer to point to the institutions through which the economy is organized. Again, in inquiring into the institutions one can choose between values and motives on the one hand and physical operations on the other, either of which can be regarded as linking the social relations with the process.'

V.N. Andreyev).[102] The inter-fusion of historical, epigraphic and archaeological work,[103] together with renewed controversy concerning the nature of the ancient economy and methods for its research,[104] provided the stimulus for this work (as well as a willingness for Marxist historians to engage in debate with Western scholars), and many of the new research directions were to find ultimate expression in the publication of *Problèmes de la terre en Grèce ancienne*.[105] J.H. Kent's study of the Delian temple estates in 1948 had illustrated the variety of vocabulary which might be employed in the description of agricultural buildings and land found in epigraphic sources; now prices and types of land in Attic inscriptions were collected by Andreyev (in the finest tradition of Russian agrarian history, although with an obligatory Soviet twist).[106] An institutional approach in the Guiraudian tradition was favoured by D. Asheri,[107] and J. Pečírka,[108] while L. Robert contributed epigraphic insights into rural toponomy,[109] land cultivation and animal husbandry.[110]

Re-examination of literary sources, for example Homer,[111] and Hesiod,[112] was informed not only by comparative anthropology and history,[113] but also by the rediscovery of the fundamental importance of land in the ancient economy,[114] and discussion whether the relationship between town

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[102] Raskolnikoff 1975: 210 on directions of Soviet scholarship at this time; Raskolnikoff 1975: 215 n.27 for the work of Andreyev in Leningrad (N.B. Raskolnikoff 1975: 246; Finley 1980: 60-62 on disputes between Marxist and non-Marxist approaches to ancient slavery in the early 1960's). For the Polish contribution, see Zawadzki 1960-1, followed by Nowicka 1975.

[103] Snodgrass 1991b: 2-3.

[104] e.g. Will 1955-6: 153, 'nous pouvons dès l'abord écarter ce qui, de toute évidence, a été le fondement premier de toute l'économie grecque antique: l'agriculture. L'archéologie n'a apporté ici sa petite contribution que sous l'espèce de quelques documents figurés, de quelques peintures de vases principalement, représentant des scènes de la vie rurale et des travaux des champs. C'est peu de chose, et assez anecdotique — et il semble que nous n'ayons pas à attendre davantage. Les problèmes souvent fort difficiles que pose l'économie rurale sous ses divers aspects relèvent principalement de la critique de textes: l'archéologie ne sera sans doute plus ici d'un grand secours.'

[105] This renewed interest in the field of ancient history found a parallel in contemporary anthropological work (e.g. Friedl 1962; Campbell 1964; Pitt-Rivers 1963) and geography (Thompson 1963; Wagstaff 1965).

[106] Lewis 1973: 187; Andreyev 1974.

[107] Asheri 1963, 1966.

[108] Pečírka 1966.

[109] Leveau 1984b: 86.

[110] Robert 1949, 1960.

[111] Finley [1954] 1978; Richter 1968.

[112] Detienne 1963; Walcot 1971.

[113] See especially the work of Finley (e.g. Finley 1975: 72, 1985b: 118) and Humphreys (e.g. Humphreys 1978: 157, 'Above all we need to make more use of comparative studies of other ancient societies, eastern and western, of later periods in European and oriental economic history, and of modern peasant societies and developing economies. Comparison will not tell us exactly what happened in Greece but, where our sources are so fragmentary, it is an essential stimulus to re-examine our reconstructions by setting them against concrete data from better-known societies, and reminder that the questions which our evidence might permit us to answer are not the only questions to be asked.'). Amouretti 1991: 119 notes that the inquiries of the French structuralist school in this area concentrated on the literary sources.

[114] Zawadzki 1959-1960, 1961; Amyard 1967: 274, 287; Finley 1985a: 97, 125.

(*asty*) and country (*chora*) ought to be viewed as a dichotomy or a continuum.[115] Both the substantive approach, which analysed the sphere of economic activity 'embedded' in wider socio-political structures, and the structuralist influences of French scholarship (often sympathetic to Finley's formulation of the ancient economy), focused attention on these issues.[116]

Some perceived a sharp socio-cultural (and even moral) distinction in ancient literature between the urban (*asteios*) and rural (*agroikos*),[117] while for others, 'there was indeed a tendency in Greek political thought towards eliminating altogether the distinction between town-dwellers and country-dwellers'.[118] Literary evidence for the nature of rural settlement has been recognised as part of the invention, idealisation and fantasy featured in 'dramatic landscapes',[119] but the problem may also be one of urbano-centrism among ancient historians as much as the ancient sources, which may prejudice historians towards a negative view of relationships between town and country.[120]

In economic terms at least, there appears to have been a spectrum of relationships, ranging from the complementary and symbiotic to the 'divorce' of the countryside from the urban sphere, a debate to which new archaeological practices could contribute.[121] The term 'rural archaeology' could encompass a broad range of activities, as Paul Courbin subsequently noted,[122] but the

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[115] Humphreys 1978: 112, 'Any study of the economic history of the ancient world must begin with the question of the relative importance of country and town.' Finley [1977] 1981: 6, 'the starting-point for the historian of the ancient city must be the attachment between hinterland and city.' See also Sanders 1977: 146-158; Champion 1989b for the same discussion as part of contemporary anthropological approaches to urban-rural relations.

[116] N.B. Meikle 1995b: 184-185 observes that the term 'embedded economy' was Polanyi's, and was not used in Finley 1985a (*cf.* Austin & Naquet 1977: 8-11).

[117] Sakellariou 1989: 493-494; André & Baslez 1993: 26.

[118] *cf.* de Ste. Croix 1981: 9 who, while acknowledging the 'urbane' and 'country bumpkins' sees, 'no fundamental difference between those who lived in or near the urban centre of the *polis* and the peasants who lived in the countryside...Both groups, however, were Greek and participated in a common culture to a greater or less degree.') Redfield 1988 describes the phenomenon of the *polis* as 'the urbanisation of the countryside' in cultural terms. For the opposite view, Hanson 1995.

[119] Roy 1988; 1996. For different interpretations of ancient settlement patterns from the literary evidence (e.g. whether the house of Knemon in Menander's *Dyskolos* is 'isolated' or part of the deme settlement at Phyle), Langdon 1991; Hanson 1995 (favouring degrees of isolated farmstead settlement explicit in written sources) vs. Osborne 1985a: 17, 21-22; 1987: 19; 1996c: 56-57 (no clear literary evidence for isolated farmsteads). See Brunet 1992: 34-36 for review of debate.

[120] Braudel 1980: 184; Leveau 1983a: 920-921, 'Les historiens de l'Antiquité avaient pris l'habitude d'envisager le rapport ville/campagne dans la perspective d'un évolutionisme culturel, l'urbanisation s'identifiant au progrès humain et la ruralisation étant synonyme de régression...Une vision pessimiste du rôle de la ville dans les économies antiques est en fait l'une des conséquences de la prise de conscience de ce qu'avait d'excessif la place qu'on lui attribuait dans les sociétés antiques.' *cf.* Herzfeld 1992: 93 who sees the 'value-laden opposition' of rural and urban as a tropological distinction, subordinate to a distinction between 'traditional' and 'modern(ising)'.

[121] Ehrenberg 1962: 82 for 'the inseparability of the two spheres'. Caro Barojo 1963: 31, 'In spite of the classical authors' insistence on the particular quality of rural as opposed to urban life, they had very distinct ideas on the close relations of the city with the country and on their necessary connections. And it is worth noting that when they do the work of sociologists (rather than historians, geographers, or moralists), they begin to see clearly something that can be defined as a linking of functions between the city and the country.' Also Humphreys 1978: 134; Finley 1985a: 123, 191. Jones 1940: 268; Hopkins 1978: 73 for urban centres 'economically parasitic on the countryside' (*cf.* Leveau 1983b: 281 who argues that the concept of the 'consumer city' is too problematic to be applied to the ancient city).

[122] Courbin 1988: 134.

archaeology of settlements (whether isolated farmsteads or higher order settlements such as villages), their long-term geographical and geological contexts, and specialist paleo-botanical studies had, in the past, tended to be conducted separately. [123] Now the Minnesota Messenia expedition brought together diverse sub-disciplines in a regional study of land use, population and settlement patterns, employing some of the methods of the 'New Archaeology' across a long-term chronological perspective.[124]

REGIONAL PROJECTS

Regional studies have long had a place in the study of ancient Greece,[125] but a number of practitioners in different disciplines, including historians of the *Annales* school,[126] and social anthropologists working in the Mediterranean,[127] converged decisively towards regionally orientated projects as the 'first wave' of archaeological survey began.[128] Earlier justification for a regional focus of inquiry had been made by G. Fougères in his 1898 introduction to a history of Mantineia. Responding to numerous, general narrative histories of Greece which had been recently published, Fougères argued that future historical enquiries into ancient Greece ought now to proceed by 'minute analysis' and by particular, rather than general inquiry.[129]

This approach to regional studies does, however, appear to have been implicated in the deterministic tendencies of some contemporary historical geographers.[130] Regions appeared as naturally occurring, internally homogenous and immutable phenomena, circumscribed by boundaries created by physical geography, such as rivers and mountains. Physical factors, such as soil and climate, rather than providing opportunities for a spectrum of possible human responses to

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[123] e.g. Jasny 1944.

[124] McDonald & Rapp 1972 (*cf.* Fotiadis 1995). Ucko, Tringham & Dimbleby 1972 also provided an inter-disciplinary forum for the re-assessment of human settlement and land use.

[125] *viz.* the acknowledgement of Woodhouse 1897: vii-x in his introduction to a regional study of Aitolia. See also below p.45.

[126] Braudel [1949] 1972; Le Roy Ladurie [1966] 1974: 289.

[127] See especially Kolodny 1974; Davis 1977.

[128] Cherry 1983 for a summary of regional survey archaeology. Small 1995: 15-16 on the interpretation of archaeological material from rural contexts within the timescales of an Annaliste paradigm.

[129] Fougères 1898: ii, 'La possession d'une série de monographies, où chaque cité grecque serait étudiée à part, contribuerait avec efficacité à cette oeuvre d'ensemble.' *cf.* Hodder 1987b: 2.

[130] Fougères 1898: ii, 'Les républiques grecques nous apparaissent à distance comme des microcosmes dont la vie intérieure peut être aisément réduite en formules. Mais, sans méconnaître les lois générales qui ont présidé au développement de ces organismes, on ne doit pas oublier que chacun d'eux possède sa physionomie propre et son tempérament individuel. Sans doute la structure physique des différentes patries helléniques les prédisposait à une certaine uniformité de pensées et d'attitudes. Mais, à chaque canton, la nature du sol local, le climat, la position relative imposaient des besoins, des intérêts et des désirs particuliers. Le relatif n'a eu nulle part plus d'importance qu'en Grèce: c'est lui qui nous donne la clef des faits généraux.' Freeman [1881] 1903: 8 for the historical 'destinies' of Greece and Rome which were 'impressed on them by their geographical position'. See above n.27.

environmental conditions, instead actively determined particular aspects of human culture according to geographical region,

> 'Elle [Mantineia] présente aussi un intérêt d'ordre quasi théorique. La constitution géologique de son sol, son régime hydrographique et sa position au nord de la grande plaine fermée d'Arcadie ont influé sur sa mythologie, sur son histoire et sur sa politique suivant un déterminisme très apparent dont peu d'États grecs offriraient un exemple aussi typique. C'est donc un milieu en quelque sorte *schématique* pour étudier l'action du sol sur un groupe d'hommes, la conversion des phénomènes physiques en idées religieuses et par suite en énergies morales, le jeu des influences étrangères, bref toutes les causes qui collaborent à la formation et à la vie d'une cité grecque.'
> Fougères 1898: iv-v.

Febvre had objected to the determinism which underlay such regional studies in his essay 'The Question of Regional Monographs'.[131] Fifty years later, Finley further criticised the genre of regional history on a number of other issues.[132] Applied to Greek antiquity, a 'regional' study might indeed refer to an area such as Aetolia or Mantineia, but it could also refer on a smaller scale to a single *polis*. In this case, the dimension of 'regionality' was provided by the territorial, political space of a *polis* (which did not necessarily have to appeal to natural boundaries of physical geography). According to Finley, the danger of a regional perspective, especially when it was co-terminous with a single *polis*, was that it became an excuse for 'tell-all-you-know' antiquarianism.[133]

Therefore it might be questioned whether the regional perspective in historical inquiry has any useful application. However, despite these potential pitfalls, historians, archaeologists and geographers have argued powerfully for retaining the region as a useful focus of research,[134] since it could provide comparative perspectives beyond the most well known areas from history, and thus enrich the variety of experience by altering the 'balance of knowledge' away from traditional areas of study.[135] The region could also serve as the basis for inquiries into wider systematic relations between human populations and modalities of local and long-distance resource exploitation.[136]

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[131] Febvre 1925: 77-82. Knapp 1992b: 6; Sherratt 1992: 138 discern a similar determinism in the *long durée* of Braudel's approach.

[132] Finley [1977] 1981: 20.

[133] Finley 1985b: 61, 'Instead of efforts to establish clearer patterns of city behaviour through the employment of simplifying assumptions, there has emerged in recent decades a spate of pseudo-histories of ancient cities and regions in which every statement or calculation to be found in an ancient text, every artefact finds a place, creating a morass of unintelligible, meaningless, unrelated "facts".' See also Amyard 1967: 285.

[134] e.g. Cartledge 1979 for Lakonia; Renfrew & Wagstaff 1982 for Milos; Shipley 1987 for Samos. Sack 1980: 86-88 on new approaches by geographers to regional analysis in order to understand the formation, articulation and differentiation of space in human societies. *cf.* Entriken 1991: 17 on the continuing debate, 'the concept of specific region is both the most distinctive as well as the most controversial aspect of regional geography.' See Johnston 1991: 38-68 for the historiography of regional studies in geography.

[135] van Andel & Runnels 1987: vi, 3; Snodgrass 1991b: 68; Smith 1996: 1.

[136] Humphreys 1978: 29. See especially Wallerstein 1974.

Nonetheless, the problem of producing regional studies which have comparative validity beyond their own 'microcosm' is not limited to historians of the *polis*.[137] Such debate (in anthropology, archaeology, geography and history) has often revolved around claims to 'typicality', even though, as Michael Herzfeld notes with regard to anthropology, wider definitions are themselves largely derived from studies of small-scale rural societies.[138] The tension between universalising and particularising perspectives in the study of place, where, 'the scientific search for universals seems to trivialise the interest in the particularity of place',[139] is further complicated in the case of ancient Greece by attitudes towards variety and diversity of *poleis*.

Territorial size alone is not sufficient in providing a reference point for inter-*polis* comparison: the type and distribution of a variety of agricultural and non-agricultural resources, the rhythms and intensity of their exploitation — often related to the availability (and type) of labour, and local environmental conditions — together with political considerations, are additional varying factors.[140] However, as Robin Osborne notes, there are limits to the diversity: the *countryside* is a common denominator in the experience of the *polis*.[141]

Thus, although there was a certain amount of wheel re-invention in the 'discovery' that disciplines such as geography could make a contribution to the study of the ancient countryside,[142] and a suggestion that the Messenia survey followed the anthropo-geographic, determinist tradition in its narrative of regional history,[143] techniques adopted from locational geography (the heir of von Thünen) were subsequently refined in other regional surveys which took place during the 1970's.[144] Central Place Theory, Site Catchment Analysis (which could be applied to the smallest rural site in an attempt to investigate the size of territory associated with the site and inter-relationships with other sites) and Geographical Information Systems (GIS) became salient techniques in the mapping and analysis of geographical regions, although subsequent work has cautioned practitioners to the

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[137] See Davis 1977: 5. Wolf 1982: 14, 'Functionalist anthropology, however, attempted to derive explanations from the study of the microcosm alone, treating it as a hypothetical isolate. Its features were explained in terms of the contribution each made to the maintenance of this putatively isolated whole. Thus, a methodological unit of inquiry was turned into a theoretical construct by assertion, a priori. The outcome was a series of analyses of wholly separate cases.' Also Amyard 1987: 103; Herzfeld 1987: 5-12.

[138] Herzfeld 1986: 216.

[139] Entriken 1991: 3.

[140] See Nixon & Price 1990: 165-166 *contra* Ruschenbusch 1983, 1985.

[141] See Osborne 1987: 193-197; Burford 1993: 2 on the effect of landed interest throughout Greek society.

[142] Through Kirsten this approach had never left German scholarship, while the geographical dimension of the *Annales* school ensured likewise among French Mediterranean history (Leveau 1984b: 89; Bruneau 1984-5b: 233-234).

[143] See Fotiadis 1995: 70-71 for a Febvrian critique of assumptions underlying the Messenia survey, 'For Messenia, that is, to be a suitable ground for the practice of archaeological ethnography, one needed first to construe it as a marginal region *in general*. Of particular interest here is the appeal to geography, for it makes Messenia's marginality appear as a *natural* condition, an effect of geography.'

[144] Snodgrass 1990: 118-119; Bintliff 1994a.

complexities which these techniques involve, and the danger of reductive analysis (especially the danger that the publication of survey results may reduce any problematic to a 'two-dimensional dots-on-map').[145]

In this respect, it is important to emphasise that the archaeological record is, 'a pattern of activities "collapsed" into an array of features,[146] and that as an explanation of human social history, such a 'functional' analysis of landscape may ignore important symbolic and cultural dimensions,

> 'Under the morphological method landscape becomes a static, determinate object of scientific enquiry...Below this [morphological analysis] lie deeper meanings which are culturally and historically specific and which do not necessarily have a direct empirical warranty. Formal morphology remains unconvincing as an account of *landscape* to the extent that it ignores such symbolic dimensions — the symbolic and cultural meaning invested in these forms by those who have produced and sustained them, and that communicated to those who come into contact with them.'
> Cosgrove 1984: 16, 18

PROBLÈMES DE LA TERRE : THE RURAL LANDSCAPE AND THE *POLIS*

Indeed, the use of archaeology in order to seek answers to the problems of the 'économie rurale' which E. Will had raised, was prominently displayed in *Problèmes de la terre*.[147] In a series of fundamental articles, concluding with 'Homestead Farms in Classical and Hellenistic Hellas', J. Pečírka had brought to the attention of English language scholarship the results of survey and excavation research undertaken in Chersonesos Taurike, summarised the state of knowledge concerning rural settlement in the ancient Greek world, and suggested archaeological approaches to interpreting meanings of rural sites, which went beyond the assumptions of military topography that had predominated to this time.[148] Pečírka's work — with its focus upon settlement and land use in the countryside (*chora*) — received the support of Finley, even though he ultimately (albeit ambivalently) expressed the opinion that isolated farmsteads were not a significant feature of the

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[145] Haggett, Cliff, Frey 1977: 19; Collis 1986 on the application and limits of models such as Central Place Theory, especially the confusion which can arise by rigidly assuming that centres (e.g. an *asty*) act as economic, political or administrative 'central-places'. A more sophisticated analysis, which appreciates more fluid and variable patterns is required, as Davies 1997: 29 notes of the relationship between urbanism and the *polis*, 'such a topographical-functional specification need say nothing about power distribution, sense of community or degree of independence: a town need not be a state or a *polis*.' Gamble 1982: 164; Bintliff 1994b: 207-211, 228 for the limits of site catchment analysis).

[146] Ingold 1993: 162 (*cf.* Rykwert 1976: 202).

[147] Will 1955-6: 153.

[148] Dufkova & Pečírka 1970; Pečírka 1970, 1973. Also Snodgrass 1987: 117-118 for interpretation of rural site functions.

ancient Greek landscape.[149] Finley suggested the reasons as to why investigation of this phenomenon was important,

> 'The homestead farm is not a mere architectural curiosity; it is one of several ways of organizing rural residence, and "quasi-statistical" statements are a reasonable and legitimate goal, distinguishing periods of time, for example, or kinds of labour force, terrains and products, distances from the centre.'
> Finley 1973b: 11

Parallel support for this approach, employing 'a more historically and sociologically orientated archaeology',[150] was advocated by Sally Humphreys in a series of programmatic essays, 'Archaeology and the social and economic history of Classical Greece' and 'Town and Country in ancient Greece'.[151] Humphreys echoed Finley in noting that quantitative archaeological study of rural sites might give valuable insights into a wide spectrum of inter-related questions about the social history of the *polis* (otherwise unanswerable through a re-examination of literary sources alone) namely: 'the measurable clustering or even gradation of settlement sizes and densities', 'the hardness or permeability of boundaries between town and country' and 'the nature of the country-dwellers' relations with the city and its institutions'.[152]

The rural sites which had previously received most attention, namely military structures,[153] were integrated by the analysis of Yvon Garlan into the tradition of Guiraud and Heitland: the countryside of war was also the countryside of productive activity,[154] stimulating renewed investigation into the relationship of agriculture and warfare.[155] Architectural information regarding the distinctive 'tower' sites researched by Young had already begun to be assembled by Maria Nowicka,[156] but more was now needed on the context and inter-relation of sites within a territory, and it was in this respect that archaeological survey has proved most effective,[157] by increasing

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[149] Finley [1977] 1981: 3, 'Even the agrarian population, always a majority, most often lived in communities of some kind, hamlets, villages, towns, not in isolated farmsteads.' Finley, however, chose to qualify this remark with a cautionary note that, 'this subject has not been properly investigated.'

[150] Humphreys 1978: 5.

[151] Humphreys 1978: 109-129, 131-135. See also Humphreys 1993: xxii.

[152] Quotes from Humphreys 1978: 134. See also Finley 1985a: 125; Wallace-Hadrill 1991: xiii-xvii.

[153] e.g. McCredie 1966: 25-28 (see now Lauter 1992; Lohmann 1993a: 139-141 for agrarian interpretations of Attic sites); McNicoll 1972, 1997 (see now Milner in McNicoll 1997: 207 for a critical review of McNicoll 1997: 41-45 where rural sites were interpretated as part of a Carian signal tower system when in fact they may have fulfilled a domestic, agrarian function); Winter 1971; Adam 1982: 71-75.

[154] Heitland 1923: 3; Garlan 1968, 1973: 155-157.

[155] See Hanson 1983, 1995; Osborne 1987: 140; Foxhall 1993b.

[156] Nowicka 1975 (neither urban nor rural towers were discussed in Wycherley 1962, despite sections on fortifications and Greek houses).

[157] Snodgrass 1987: 99 on the contribution of archaeological survey 'to a different branch of historical study from the traditional, event-orientated political one, and to do this on the scale, not of a single, restricted locality, the site,

information about sites beyond that of the basic architectural data to include questions of local land use.[158]

ANTHROPOLOGY, ARCHAEOLOGY AND HISTORY: INTERDISCIPLINARY PROBLEMS

> 'The size of the topographic context of a site naturally varies with the size and complexity of the settlement concerned; one could perhaps say as an approximate definition that the context stretches as far as the nearest site of the same type. A farm must be related to the position of neighbouring farms, a village to surrounding villages. A city-state's context is its territory.'
> Humphreys 1978: 124

Pečírka's contribution was not the only study in *Problèmes de la terre* in which the countryside featured as central to *polis*. The *chora* now received sustained attention in a Western Greek context: given the apoikic setting of earlier work in the Black Sea, quantitative methods in the tradition of Beloch and Jardé appeared especially suited to these *poleis*, primarily agrarian and often featuring archaeologically visible land divisions.[159] An archaeology of territory was also possible in other *poleis* where, even if internal sub-divisions of land could not be traced archaeologically in similar detail, territorial boundaries were clearly delimited, enabling hypothetical quantification of the productive landscape, which could then be compared to population estimates.[160] Attika, perhaps inevitably given the relative wealth of literary and epigraphic sources pertaining to it, remained the most fully researched *chora*.[161]

However, the difficulties in ascertaining a reliable population estimate (whether through documentary or comparative evidence such as life expectancy tables), and allowances for variability of agricultural productivity and total production (such as the amount of land under cultivation, the cycle of crop growing, and the intensity of labour input which all influence the nominal 'fertility' of any land) mean that this 'macro-level' approach to the economic geography of the ancient countryside — treating the production of a *chora* as a monolithic whole (although

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but of a *region*. It explores the rural sector of ancient Greek life on which our ancient sources are most defective, and corrects the urban bias of the past century and more of excavation in Greece.' See also van Andel & Runnels 1987.

[158] e.g. Munn 1983: 401-469, Ober 1985: 130-180, Yoshiyuki 1993 for north Attika and Megarid. Lohmann 1993a: 138-184 for southern Attika. Cherry, Davis, Mantzourani 1991b for Keos. Spencer 1993: 87-121; 1995c for Lesbos. Osborne 1986; Brunet 1988a for Thasos.

[159] Vallet 1968; Lepore 1973; Métreaux 1978; Boyd & Jameson 1981; Koerner 1987; Carter 1990; de Angelis 1994.

[160] The work of Figueira 1981 on Aegina (under the supervision of Jameson), and Garnsey 1988 on Attika remain the two clearest examples. See also Ruschenbusch 1983, 1984, 1985. For literary sources, see now Audring 1989.

[161] Audring 1977-8; Osborne 1985a; Garnsey 1988; Sallares 1991 (*cf.* Raaflaub 1991: 565-568 for its atypicality; Garnsey & Morris 1989 for a more general overview of food production and supply in the Greek world).

known in antiquity, e.g. Isokrates IV.42, Xenophon *Poroi* I.2) — is rather limited when attempting to contextualise individual rural sites.[162]

Another approach was to embrace (wittingly or otherwise) the qualitative differentiation of productive landscapes within a *chora* advocated by Zimmern, and relate archaeological evidence to them.[163] Humphreys had suggested the range of information which excavation or rural sites might yield in answer to questions of social history,

> 'Excavation of farm buildings could give information about their size and equipment; whether crops were grown for the market (an oil or wine press would probably not be constructed merely for household needs); whether the farmer grew his own corn (did he have a threshing floor?); the influence of urban fashions in architecture, or the persistence of specialised designs...Storage rooms and pithoi suggest farming for the household's needs and storage of the bulk of the harvest, while coins and urban products such as painted vases show connections with city markets.'
> Humphreys 1978: 113

There were, however, limits to this approach, namely the representative validity of evidence from a single rural site, especially in territories which displayed a high degree of local variation in terrain, gradients, soils, or where there seemed to be marked differences in the quality of rural buildings.[164] The results of archaeological survey seemed particularly suited to contextualisation of the individual site within the wider landscape of the *polis*. By adopting models of locational geography (most notably Central Place Theory, which modelled different relationships between an urban centre and lower order sites according to political, administrative and socio-economic factors), a hierarchy of sites (according to relative size) could be constructed from the results of archaeological survey. This approach provided an explanatory as well as descriptive element which focused on the inter-relationship between individual sites.[165]

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[162] *viz.* Finley 1985b: 30 on the limits of this kind of hypothetical quantification which, 'cannot escape the limitations and risks inherent in complex multivariate analysis....the result will be, or at least always has been so far, sharp disagreement and controversy, not over techniques as such but over the analytical choices and the resulting conclusions.'

[163] Wagstaff & Cherry 1982: 251.

[164] Snodgrass 1987: 129-130, 'The careful and total excavation of just one "farmstead" site would, for instance, be invaluable as a test of how far the significant periods of occupation coincided with those conspicuously represented in the surface finds. But as a test of our interpretation of the function of the whole class of such sites, it would be less decisive: the process would really need to be extended over a larger number of sites that were similar in respect of their surface traces. Even then, it would by no means follow that the issues left in doubt by survey would be settled by the excavation. The distinction between seasonal and permanent human occupation, after all, is one that requires some sophistication on the analysis even of excavation finds.' As Osborne 1992a: 22 notes, 'One farm establishment cannot create a market economy, and any claim that the farming economy represented on a single site was market-orientated rather than subsistence-orientated has to be part of a claim about the economy as a whole.'

[165] Wagstaff 1982: 71 gives a basic definition of a settlement site, 'a settlement site is simply the area occupied by the houses and associated facilities belonging to the people making up a particular community. If these are clustered and the area occupied relatively small, then the site possesses a few, easily identified properties. It will have a particular surface configuration, which results from the action of physical processes on the underlying rock, and it will be covered with soils of specific quality and potential. The site will stand in a special relationship with the surrounding countryside and, though occupied by a settlement, may not be otherwise very different from other physical features in the neighbourhood. The sharing of characteristics means that sites can be classified.'

The problem was partly one of technique: what intensity of artefacts constituted an intentional 'site' as opposed to random background scatter ? What was the best way of ensuring coverage of a region while identifying sites on the ground ? Was the concept of 'site' even a useful heuristic tool ? Debate over the relative merits of extensive survey (in certain respects a realignment of traditional topographical enquiry) and intensive survey have illustrated the methodological complexity of any attempt to 'map' a human landscape, as well as illuminating practical problems of survey coverage and the relation of survey teams (composed predominantly of non-nationals) to local landowners and populations.[166] Even among practitioners of intensive survey, there still appear fundamental differences of opinion over the interpretation of artefact variability in the landscape.[167]

Perhaps even more crucial was the question of overall coverage: survey practitioners have acknowledged that in attempting to investigate the 'totality' of an archaeological landscape, there has been a general propensity among survey projects to favour lowland areas (valleys and plains) at the expense of upland areas, often for understandable, pragmatic reasons, but which nonetheless may implicitly downplay the vertical dimension of landscapes and create an unconscious 'lowland bias' in the final analysis.[168]

Nonetheless, archaeological survey has continued to make an effective contribution to the mapping of rural landscapes, sensitive to the respective role which political and socio-economic factors may have played in the formation, distribution and life-cycle of rural sites.[169] The technique has also raised important questions relating material evidence to human praxis: survey might identify primary urban centres (such as the *asty*), or indeed nucleated lower order settlements (a village), but the extent to which remains of the domestic level of social organisation — the *oikos* ('household') — are archaeologically identifiable is problematic.[170]

The *oikos* constituted more than domestic buildings: it was a dynamic social unit,[171] which included proprietorial and personal, kin (and non-kin) relations.[172] Due to these spatial and temporal dimensions, an *oikos* was not necessarily restricted in archaeological terms to a single 'site' (just as membership of an *oikos* was not restricted to the nuclear family but might include

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[166] For extensive survey, see Noyé 1988; Blum, Darmezin, Decourt, Helly, Lucas 1992; advocating intensive survey, Gallant 1982a; Cherry 1983; Bintliff & Snodgrass 1985: 128, 1988; Wright, Cherry, Davis, Mantzourani, Sutton 1990; Cherry, Davis, Mantzourani 1991; Lohmann 1993a; Jameson, Runnels, van Andel 1994; Alcock, Cherry, Davis 1994: 137. Fotiadis 1995 for the interaction of survey teams and local populations.

[167] Alcock, Cherry, Davis 1994; Bintliff 1994a: 8-10.

[168] Bintliff 1994a: 10.

[169] Cavanagh 1991; Snodgrass 1987-9, 1990.

[170] As Abrams 1989: 63 notes, 'archaeologists do not excavate energy but rather the material embodiments of energy.'

[171] Lacey 1968: 16 for the *oikos* as 'living organism.'

[172] MacDowell 1989: 10; *cf.* Foxhall 1989.

vertical and lateral, multiple-generational relations, as well as unrelated dependents and chattels). Physical structures (which might include town-houses, seasonal shelters for bailiffs and work-force, or farmsteads) were only components in a wider social totality, whose use was dependent upon other factors affecting constituent members of the *oikos*.[173] The 'life-cycle' of a domestic structure might range considerably in duration of use; nor would archaeological remains necessarily represent continuous use by generations of the same household.[174]

The response, by one of the pioneers of survey, has been to admit that ancient rural households at the lower end of the social-economic scale may simply be archaeologically invisible in the present state of knowledge.[175] Domestic rural sites which can be identified (usually of stone construction) are thus unlikely to be fully representative of the rural population, and therefore our assumptions concerning the archaeological record must be moderated to account for this potential bias.

Such problematics concerning archaeological 'site' identification and interpretation have formed part of a broader re-examination of anthropological approaches to the archaeology of landscape.[176] One approach to the contextualisation of individual rural sites within a landscape has been to work from a micro-level, 'bottom-up' perspective, relating a site to its locality and attempting to differentiate 'textures' within a region.[177] In contrast to macro-level, 'top-down' perspectives, which tended to treat a *chora* as a single, and implicitly homogenous whole (for example as regards the pattern of settlement), a micro-level perspective, when applied to the territory of a *polis*, may be more sensitive to internal variations, and may thus reveal patterns of smaller interlocking units which constitute a particular 'region'.[178]

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[173] Xen. *Oec.* 1. As Foxhall 1989: 24 notes, the concept of 'household' is neither a tidy, fixed or closed category, which has ramifications for any attempt to interpret the social context of archeologically visible, domestic structures.

[174] Gallant 1991: 11-33; Smith 1992: 29-30; Pomeroy 1997: 23-28.

[175] Jameson 1994: 62. See also Foxhall 1990: 107-108; Osborne 1992a: 21 and comments of Foxhall in Wells 1992: 171, 'Most of our archaeological evidence represents richer rather than poorer families. I am inclined to feel that the poorest drop out of the archaeological record and are simply not visible.'

[176] e.g. Tringham 1972 for the difference between an archaeologically visible 'settlement' and a 'community' (i.e. certain dwellers in a settlement could be excluded from the community, and the geography of a settlement may not be coterminous with the territory of a community): a point relevant to any discussion of settlements within a *polis* where dispersed settlement may have occurred among both the citizen body and persons (such as slaves) excluded from the community (see Burford 1993: 57 on Attic demes). On anthropological approaches to the interpretation of archaeological landscapes, Rossignol & Wandsnider 1992; Bender 1993a; Hirsch & O'Hanlon 1995.

[177] Clarke 1977b: 11-15 for 'micro', 'semi-micro' and 'macro' levels of comparison (corresponding respectively to household, community, region).

[178] *cf.* de Pina-Cabral 1989: 404 on ethnography, 'My suggestion is that we start from the level of subregional comparison and work our way towards wider and wider levels of comparison. There has to be a constant dialectic between what we generalize for one level and what we generalize for levels above and below it. A town may have many quarters, just as a district may have many towns, a region many districts, and so on. In other words, all ethnography is an exercise in comparison—miniscule subregional comparison.' Also Fleming 1990.

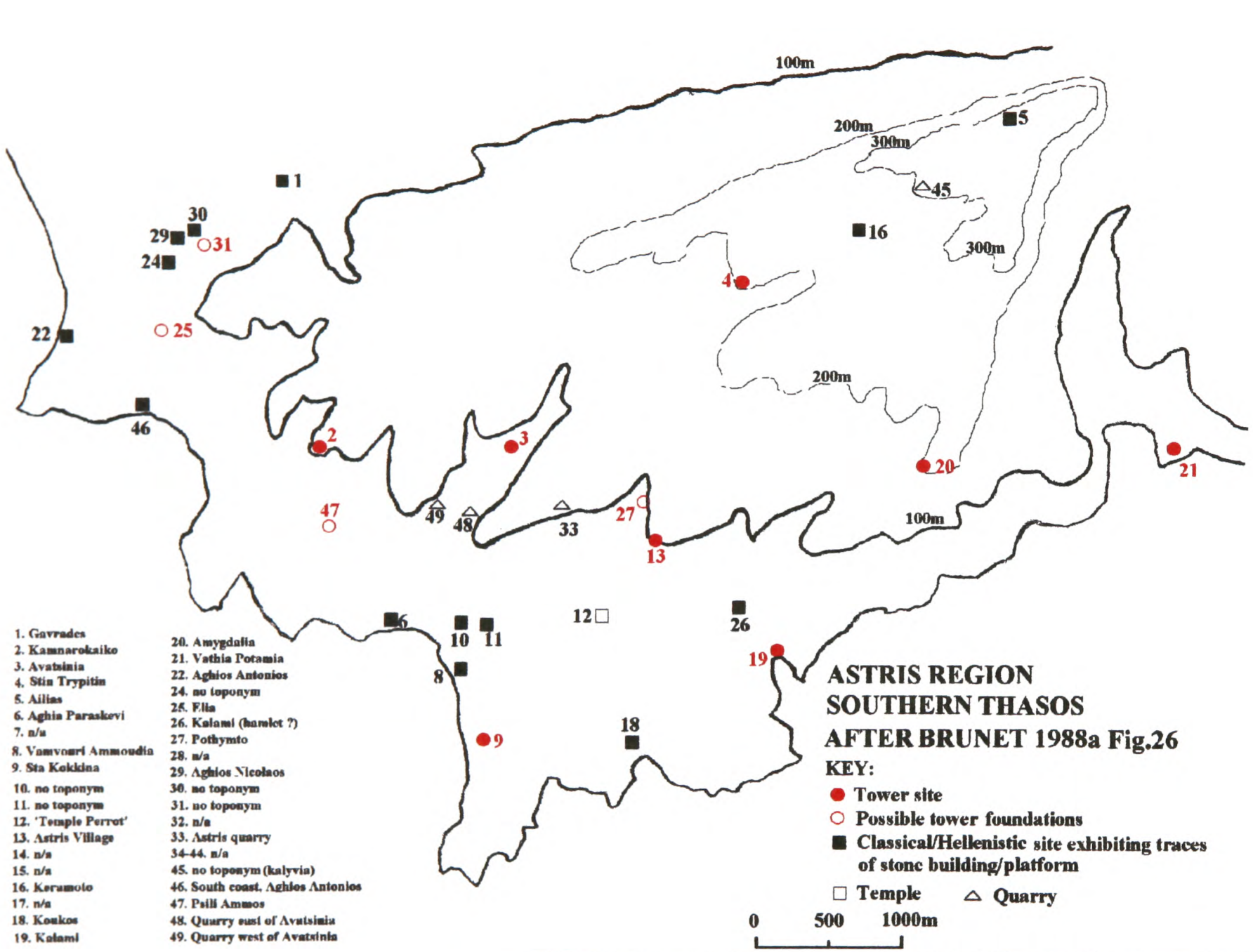

FIG.1.1: *Astris micro-region of southern Thasos after Brunet 1988a.*

One such unit of interpretation, which bridges the archaeological hierarchy between a 'site' and a 'region', while remaining sensitive to variations in human social organisation, has been labelled a *locale* by human geographers, and a *micro-region* by archaeologists.[179] The value of the approach is to focus on human activities at a level which corresponds to the economic geography of the rural landscape,

> 'produisant des images complémentaires dans leur degré de finesse: la microrégion est le cadre idéal pour mettre en lumière les rapports tissés entre l'homme et le milieu et les liens qui umissent entre eux les divers sites. La comparaison à l'échelle insulaire de l'ensemble des unités écologiques devrait faire apparaître des constantes dans les schémas d'implantation, mais aussi des différences dans l'organisation de l'espace.'
> Brunet 1988a: 200

In applying this perspective to a study of the countryside of Thasos, M. Brunet identified up to thirty rural sites (including several substantial building complexes) in the promontory area of Astris in southern Thasos, datable to the fourth-to-third centuries BC (*Fig.1.1*).[180] The intensity of rural exploitation (which investment in monumental buildings in the Astris area indicated) actually owed little to the direct influence of the *asty* as a centre for consumption, but was instead symptomatic of a 'centrifugal' arrangement in which an urban centre existed alongside intensive exploitation in more distant areas of the countryside — micro-regions such as Astris which contained their own specialised, local resources (such as minerals, viticulture and arboriculture).[181] Of broad relevance was the conclusion that the patchwork of sites in an ancient countryside need not conform to a normative (Attic) model of nucleated village settlement.[182]

Survey thus needs to be sensitive to the whole range of productive activities and land use pursued in the *chora* if it is to contribute to study of the economic geography of the ancient Greek countryside.[183] Primarily this means an appreciation of agriculture: one of the most significant developments following from *Problèmes de la terre* has been renewed study of the ideology and practice of agriculture in the *polis* — essentially a restatement of Heitland's insistence on the

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[179] Giddens 1985: 271, 'Locales refer to the use of space to provide the *settings* of interaction, the settings of interaction in turn being essential to specifying its *contextuality*'; Brunet 1988a: 15. A similar approach (although the term is not used) is adopted by Lohmann 1993a in his study of domestic rural sites in the Attic deme of Atene.

[180] Brunet 1988a: 157-199 (esp. 168, 'L'exceptionnelle richesse est le signe d'une grande densité de peuplement dans l'Antiquité.')

[181] Amouretti 1994: 79, 83 fig.3. N.B. this position is not radically different from Osborne 1996c: 55-61 in regard to settlement patterns and land use in Atene region of southern Attika (Lohmann 1992, 1993a: 126-254). However, the disagreement lies in the relative 'normality' attached to areas such as Atene. Osborne argues that the location of the Laurion mines nearby created an 'exceptional' socio-economic situation which is reflected in the rural archaeology; Brunet and Amouretti argue that the 'normative' model is an Atheno-centric construct.

[182] Brunet 1992; Amouretti 1994.

[183] In contrast to some anthropological approaches (e.g. Redfield 1956: 27) which excluded pastoral and fishing settlements from analysis, claiming that they fell outside the definition of 'peasants' as small-scale, independent agricultural producers. For the unsuitability of the term 'peasant' as applied to ancient Greek agrarian history, see Burford 1993: 85-86, Hanson 1995: 413 *contra* Wood 1988.

influence of agriculture upon ancient society[184] — most notably under the respective influence of M.I. Finley,[185] A.M. Snodgrass,[186] M. H. Jameson,[187] and Y. Garlan.[188]

However, other activities such as mining,[189] fishing,[190] and animal husbandry,[191] might also have been practised (according to the availability of resources), and each might have had a distinctive effect upon the rural population and settlement patterns in a *polis*. In attempting to assess the modalities of rural production, archaeological evidence could supply some of the answers that literary sources alone could not provide. Increasingly, comparative anthropology, ethnography (the comparative study of written records) and ethnoarchaeology (the study of the production of contemporary artefacts in order to provide analogies with the archaeological record) have also been invoked.[192] One of the most distinctive features of the last quarter of a century of scholarship has been the development of these approaches, as a more sophisticated understanding of the complexity of comparative analysis has developed.[193]

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[184] Heitland 1923: 6, 'For of all conclusions to be drawn from the history of the Greco-Roman world none seems to me more certain than the fact that, while political social and moral movements affected the condition of agriculture, agricultural changes reacted upon political social and moral conditions....the fluctuations of what I may call civic values, and the position of farmers as labourers or employers of labour cannot be treated in separate compartments and their reciprocal effect ignored.' *cf.* Osborne 1987: 195, 'The Classical city was embedded in the countryside. Agriculture made the Greek city possible and established its limits. The agricultural production of the countryside shaped the social structure.'

[185] Burford 1993.

[186] Osborne 1987, 1996c.

[187] Hanson 1983, 1995.

[188] Amouretti 1994.

[189] The first systematic and quantitative archaeological survey of ancient mining remains had been made by Ardaillon 1897, in connection with ore mining and slag re-processing by the French Mining Company at Lavrion in the late nineteenth century. Interest (initially focused around the epigraphy of Classical *poletai* mine leases found in the Athenian Agora Excavations) was renewed by the work of Crosby (e.g. 1950, 1957) and Hopper (e.g. 1953, 1968), together with archaeological investigation of the Laurion by Greco-Belgian excavators (Mussche 1965; Spitaels 1982) and the British School at Athens (Jones 1986b; Photos-Jones & Jones 1994), and chemical composition analysis of industrial remains by scientists in Greece (Conophagos 1980), Germany and the UK (Gale, Genter & Wagner 1980; Gale & Stos-Gale 1981).

[190] Gallant 1985.

[191] Jameson 1988; Hodkinson 1988; Skydsgaard 1988.

[192] Ethnoarchaeology is defined here as a way to expand, 'the scope of archaeological inference by exploring the ways in which the material (archaeological) record may be used to inform us about those complex strategies, decisions, and wider social, economic and political contexts in the past' Whitelaw 1994: 165. *cf.* Forbes 1992: 88-89, 'more directly ethnoarchaeological studies are noteworthy in being directly concerned with various aspects of ancient agriculture and/or stock-keeping.' *cf.* Spurr 1986: xiii-xiv on use of ethnoarchaeology in studying Roman agriculture which 'has resulted above all in awareness of an unsuspected variety of agricultural practice in any given area and not just from region to region. It has also made it possible to identify certain general principles of agriculture and the rural economy which may reasonably be applied over an extensive chronological period. These results have in turn allowed an approach to the available archaeological material which asks more questions (and suggests more possible answers) than would have been possible only from knowledge of the Roman literary texts.'

[193] e.g. Casson 1938, 1952 for earlier examples of an implicit ethnoarchaeological approach to pottery production and distribution, though with a 'survivalist' slant (Casson 1938: 466-467), 'The average islander and coast-dweller still lives on the same food, and in similar houses to those of his ancestors...Where economy and mode of life has changed so little it seems reasonable that methods of sale have altered little.'

The immediate intellectual heritage of the comparative anthropological approach may be found in the sociological work of R. Redfield, I.T. Sanders, and P. Walcot, which popularised a synchronic analysis of ancient and modern rural populations.[194] However the tendency towards 'survivalist' comparison in Greek culture has its background in the accounts of early modern and post-Independence travellers during the sixteenth to nineteenth centuries, often embedded in ideologies of racial purity and national continuity.[195]

Even if changes in the ecology of the Greek landscape between ancient and modern times have been overstated,[196] the dangers of direct extrapolation, which assume an essential continuity of practices such as crop cultivation, animal management strategies, labour input and settlement patterns (as well as the veracity of informants in the field),[197] have been repeatedly raised by anthropologists, historians and archaeologists.[198] Changes in the organisation of domestic labour relations, internal social structures and external coercive networks,[199] in addition to changes in crops and cultivation techniques,[200] are all variable factors which may affect the type and quantity of agricultural output.[201]

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[194] Redfield 1953, and especially Redfield 1956: 2-3 for a justification of the 'survivalist' approach; Sanders 1962, 1977. Walcot 1971: 12 argued that his comparative approach to ancient and modern 'peasant' values was not survivalist (also Walcot 1996: 169, 'studies by social anthropologists working in mainly rural communities located in present-day Greece may help to deepen our understanding of the Greeks of antiquity'). However, see Danforth 1984: 61-66 on Walcot's working assumptions, tracing 'survivalist' ideology to a nineteenth-century nationalist reaction against the argument that cultural Hellenic continuity had been destroyed by post-antique invasions.

[195] Herzfeld 1982: 102-105, 1987: 8-11, 71-76, 136-38; Danforth 1984; Fotiadis 1995: 68-69; Shanks 1996: 79-80.

[196] See Rackham 1990, 1996 *contra* Hughes 1994.

[197] Jardé 1925: xvi had noted the limits of the comparative quantitative agriculture, 'En terminant cette introduction, où j'ai voulu indiquer les difficultés de l'information et l'incertitude des méthodes, je crois devoir insister sur le caractère hypothétique des déductions et des résultats.' Dubisch 1972: 37 for the difficulties encountered in ascertaining the exact size of family plots in contemporary anthropological studies. *cf.* Forbes 1992: 87 on the cultural filtering to which the data of local farmers is subject (such as number of animals, crop yields).

[198] Danforth 1984: 57, 64, 'These scholars seek to bridge a distance in time of over two thousand years that separates their present from the past of ancient Greece, and they attempt to do so by using the people of rural Greece as a mediator, a kind of stepping stone on their journey in search of the past...The people of rural Greece have become nothing more than a blank screen on which we can project our romantic fantasies of ancient Greek life.' This has also been echoed by Snodgrass 1987: 93, 'Many Western visitors seem to see it [the Greek countryside] and its inhabitants as a kind of living museum', and Golden 1992: 322, 'This cultural distancing uses the Greek villages of today as a kind of cultural time machine.'

[199] Gallant 1989, Reger 1994a for Hellenstic Greece. Davis 1991 for the effects of Ottoman administration on agriculture in Seriphos and the Cyclades. van Andel & Sutton 1987: 66, Jameson, Runnels, van Andel 1994: 148 for the southern Argolid. Thompson 1964: 18-24 for effects of Byzantine adminstration on landholding in Greece. McGrew 1985 for changes in land tenure (e.g. appropriation and confiscation of estates, transfer of monastery land) affecting demography and agriculture in post-Independence Greece.

[200] Isager & Skydsgaard 1992: 6; Amouretti 1994: 79 on examples of recent switches in crop cultivation in certain regions (often due external, financial pressures), which may produce misleading comparanda if retrojected into antiquity. Sallares 1991: 303, 372-389 for changes in crop strains affecting sowing and yield rates; Halstead 1987: 81-2 for the use of fertilizers; Rackham & Moody 1996: 79 for recent destruction of vines through phylloxera aphid and mildew.

[201] *viz.* Amouretti 1991: 125, 'Tous savent que si l'agriculteur doit constamment faire des choix, ce ne sont en fait que des choix entre des contraintes: de son temps il n'est jamais maître, même s'il a une extraordinaire capacité

The theoretical challenge has been to forge a methodology that is not survivalist, but which instead expands the horizons of the researcher to a wider range of possible human responses to certain resources such as land, while acknowledging differences between the structures of societies under comparison.[202] Although potentially useful where primary ancient evidence has been destroyed or is extremely fragmentary, the phenomenon of equifinality, namely 'the generation of apparently similar observed forms by different processes operating along different trajectories through space-time,'[203] means that comparative material must be invoked with caution, since different political, social and economic systems at different times may leave similar traces in the archaeological record.[204]

The illuminating insights which a successful ethnographic approach can offer have been developed by S.B. Sutton and J.L. Davis with regard to settlement patterns,[205] and by H.A. Koster and H.A. Forbes, P.L.J. Halstead and G. Jones, C. Chang, and T.M. Whitelaw with regard to the ethnoarchaeological aspects of land use,[206]

> 'Indeed, anthropological work has often been used to identify technological practices that are believed not to have changed from antiquity to the present. In this process, other aspects of contemporary life are discarded not as comparable to the past. Such endeavors, however well intentioned, both underutilize the ethnoarchaeological information available and reflect a misunderstanding of the historical context of contemporary Greek life. They reflect an implicit assumption that current Greek villages are carriers of an unbroken agricultural tradition only recently transformed by the processes of industrialization, urbanization, and tourism. This assumption is only heightened by the tendency of most village studies to emphasize the deleterious effects of recent out-migration, thus giving the misleading impression that these settlements have long been stable...The ethnoarchaeological study of the Greek present must, therefore, be more than a search for artifactual relics and residual cultural practices. A complete study of the contemporary situation can reveal both the interpretative context of isolated traits and the causal factors behind current settlement and economic strategies. Such insights, in turn, indicate which periods of the past most resemble the present and are thus most suitable for drawing parallels.'
> Sutton in Wright *et al.* 1990: 594-595

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d'adaptation. *Le rythme immuable des champs*, source de sécurité, est un mythe urbain, non le reflet de la réalité rurale.'

[202] *viz.* Humphreys 1993: 172, 'it is in the highest degree unlikely that any two societies will resemble each other sufficiently for an archaeologist or historian to be able to make direct inferences from ethnographic data to fill gaps in our knowledge of past societies.' Also Davies 1997: 35.

[203] Wagstaff 1987b: 30.

[204] Jameson 1990a: 195; 1990b: 109; 1994: 56 on the problem of equifinality as applied to (domestic) architecture. For example, the medieval towers of Greece were constructed in a feudal society (*contra* rural structures in a Classical *polis*). Lock 1986: 104, 123 argues that they were fief centres; Langdon 1995: 503 proposes that they were home to Frankish vassals who managed the land. See also Kramer 1979b.

[205] Sutton 1988, 1991, 1994; Davis 1991.

[206] Forbes & Koster 1976; Halstead & Jones 1989; Chang 1984, 1992; Forbes 1992, 1994; Whitelaw 1991, 1994.

However, basic questions concerning the political implications of land ownership, types of land use, the status of agricultural workers, and patterns of settlement in relation to land use remain contested.[207] Several areas in which new research has challenged the assumptions of previous models are worth highlighting for their relevance to the case study.

TRADITIONAL AND ALTERNATIVE MODELS OF THE ANCIENT GREEK COUNTRYSIDE

> 'But, to form a proper judgement of soil, it is proper likewise to get as particular information as possible of the manner in which it has been cultivated. The same soil, under different culture, has a very different appearance. When land is under bad culture it always looks much worse than it really is; on the contrary, when under good culture, it always looks much better.'
> Dickson 1788: 171

Lewis' contribution to *Problèmes de la terre* included a suggestion to modify the traditional interpretation of *eschatiai* as uncultivated regions beyond fields (*choria*), estates and farms which occupied the plains or valleys, areas of poor quality land situated on mountain slopes which bordered the territory of a *polis*.[208] Lewis argued that the use of *eschatiai* in fourth-century BC Attic epigraphy referred to marginal land possibly taken under cultivation relatively late.[209] This land was not necessarily 'marginal' in the sense of its location to an urban centre (*asty*), i.e. 'away from town', 'towards the extremities', or 'towards the sea'. Instead *eschatiai* could represent upland areas on the slopes of mountains and hills (partly echoing Robert's definition): a *vertical* gradation of the productive landscape in the tradition of Zimmern.[210] *Eschatiai* could exist elsewhere than on the frontiers between two polities, i.e. within a *polis* with no other shared land boundaries.[211]

Lewis was followed by further reassessment of *eschatiai* in the economic and cultic geography of the *polis*,[212] especially concerning the use of this kind of 'marginal' land, and its relationship to

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[207] Isager & Skydsgaard 1992: 120-123; Burford 1993: 15-33 on the status of land in a *polis*. On the estimated distribution of land under private ownership, see differing views of Jones 1957: 18; Andreyev 1974; Foxhall 1992; Osborne 1992a. Finley 1952: 64; Whitehead 1986: 152-8; Osborne 1988; Wood 1988: 181-4; Isager & Skydsgaard 1992: 154-5 on leases. Debate over the relative extent of private and temple owned land on Delos, Osborne 1985b (temple property) *contra* Brunet 1990a (private property).

[208] *viz.* Guiraud 1893: 506; Wilhelm 1913: 13; Robert 1960: 304-305; Motte 1973: 15.

[209] Lewis 1973: 210-12. The term is used to describe pasture in Homer, e.g. *Od.* XIV.103-4 (ἐνθάδε δ'αἰπόλια πλατέ' αἰγῶν ἑνδεκα πάντα | ἐσχατιῇ Βόσκοντ', ἐπὶ δ'ἀνέρες ἐσθλοὶ ὀρονται), but may also refer to cultivated land (*Od.* XVIII.358-9). In these cases, *eschatia* is occupied by servile or hired labour working for the benefit of a *Basileus*. Polyphemos' cave is likewise ἐπ' ἐσχατιῇ (*Od.* IX.182) - a reference not only to its pastoral location, but also to Polyphemos' social position, shepherding his flocks afar, living apart and having no dealings with others (*Od.* IX.188-9).

[210] The idea appears independently — Lewis 1973 does not cite Zimmern 1928. On 'marginal' farmland, Collier 1975 (see also Rougemont 1991).

[211] e.g. *IG* XII 5, 872 with Wilhelm 1913: 13; Étienne 1990: 25 and the tribe Ἐσχατιῶται attested on Tenos.

[212] Georgoudi 1974: 162-3; Burford Cooper 1977-8: 172; Audring 1989: 81-103; Burford 1993: 111; Hanson 1995: 79-80; de Polignac 1995: 62. Fotiadis 1995: 71 observes in modern archaeological studies of ancient land use

settlement patterns. At almost the same time (and perhaps unconnected to the traditional historiography of ancient Greek history), anthropologists working in close proximity to the Southern Argolid Project had emphasised the importance of 'vertical' organisation in contemporary agricultural and pastoral landscapes.[213]

Such work also demanded re-evaluation of the 'traditional' model of land use and settlement in classical antiquity — extensive farming of scattered land plots from nucleated settlements, employing a fallow system and a separation of agriculture and animal husbandry — both from the Pečírka-inspired perspective of settlement and from ethnoarchaeological perspectives of land use.[214] The 'traditional' model had received support from human geographers and anthropologists of contemporary Greece, who were of the opinion that isolated farmsteads were a rare,[215] and a relatively recent element in the landscape of modern Greece.[216] However, Halstead has shown the dangers of assuming that recent patterns of settlement and land use necessarily mirror ancient patterns, according to the 'survivalist' methodology of some ethnoarchaeology.[217]

Indeed the archaeological evidence of classical antiquity may suggest an alternative picture: intensive agriculture requiring permanent habitation, integrated animal husbandry and agriculture, and increased labour demands, often practised in areas of the *chora* distant from the urban centre,[218]

> 'If traditional extensive farming is integrally related to the traditional nucleated pattern of settlement, dispersed settlement in farmsteads and villages located nearer to the arable land might well be associated with more intensive farming. In fact a relatively dispersed pattern of settlement does seem to have been the norm for most of prehistory and has recently been documented for classical antiquity in a host of intensive archaeological surveys. Even if some of the smallest rural 'sites' located in these surveys are not permanent farmsteads, the presence of substantial (i.e. archaeologically visible) field-houses may have rather similar implications for the intensity of land use. Thus if the deconstruction of traditional agricultural practice offered here is basically valid, intensive cultivation involving regular manuring and cereal/pulse rotation may have been commonplace in antiquity.'
> Halstead 1987: 83

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the frequent amalgamation of agronomic 'marginality' with notions of general social, temporal and geographic marginality.

[213] Forbes 1982: 350 on the 'vertical economy' in modern Methana which relieved some of the pressure of work for the family labour force at crucial points in the agricultural cycle. For the 'verticality' of pastoralism in the southern Argolid, Koster 1977: 178 reporting on a herder who held folds at 100m, 250m and 500m above sea-level respectively, allowing rotation according to weather and sanitary conditions.

[214] Alcock, Cherry, Davis 1994: 147-148.

[215] du Boulay 1974: 10. This view is probably connected to the fact that a 'village' focus was especially prevalent in anthropological and geographical studies of modern Greece, e.g. Doxiadis 1968; 1972. See Wagstaff 1975 for a critique of Doxiadis' methods.

[216] Beuermann 1954; Wagstaff 1982: 20.

[217] Halstead 1987.

[218] Osborne 1992c for the Greek garden.

The 'alternative' model of intensive agriculture, which was more optimistic in its assessment of the productivity of ancient Greek agriculture than Jardé's prevailing views about extensive agriculture — 'dry farming' of fragmented land holdings, and low productivity through the practice of biennial fallow — itself relied upon research which has urged a refiguration of labour and animal husbandry patterns in the ancient economy.[219]

Finley noted in his introduction to *Problèmes de la terre* that this programmatic work did not pretend to treat all aspects of the subject, and acknowledged the omission of agricultural labour.[220] Since then, this important area has been re-invigorated by respective research into both the status and gender of the rural workforce.

Regarding status, the academic position in favour of agricultural slavery permeating throughout ancient Greek society has not been the exclusive province of Marxist historians.[221] This is likely a consequence of Finley's own engagement with post-war Marxist historians (and their ideological opponents) on questions of ancient slavery and class analysis in both *The Ancient Economy*, and *Ancient Slavery and Modern Ideology*. What emerges is the fact that the debate need not be reduced to sterile questions of dogma concerning the existence (or otherwise) of a 'slave mode of production' or speculative estimates of absolute slave numbers (spread uniformly across communities in the Greek world),[222] but can rather more usefully contribute to discussion concerning the variable *intensity* of labour required by households (which may have included free and dependent members of both genders) to cultivate certain crops (such as olives and vines) and collect the harvest under 'time stress'.[223]

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[219] Isager & Skydsgaard 1992: 112; Burford 1993: 109 on 'dry' and 'irrigated' agricultural techniques. Burford 1993: 250 n.51 for a summary of modern scholarship's attitude to the yield of the land. Thompson 1963: 7 acknowledged fragmentation of holdings, 'for the purpose of providing different habitats for crops with specialized requirements' but argued against many perceived benefits of farm fragmentation in a modern setting, 'Some limited fragmentation of farms may be more or less unavoidable or even necessary in certain environments, or may be desirable for reasons not directly connected with physical conditions. In these instances the fragmentation may be entirely reasonable from an agricultural point of view. More frequently, however, the fragmentation of farms serves no rational agricultural ends and as such division of land holdings raises serious problems on every continent and in various economies, societies, and physical settings.' *cf.* Osborne 1987: 38-40; Gallant 1991: 41-5 on fragmentation and diversification in extensive agricultural regimes as risk-buffering devices. N.B. Brunet 1992: 38 (*contra* Osborne 1985a: 62) who questions the possible correlation between fragmented land-holding and nucleated settlement patterns.

[220] Finley 1973b: 9.

[221] de Ste. Croix 1981: 39-40, 133-147, 505-509; Garlan 1988: 55-64, 142-144 for Marxist interpretations of literary sources, favouring high numbers of slaves in the agricultural workforce (see also Amouretti 1986: 199-222; Hanson 1995: 66-70). Indeed Dickson 1788: 41-135, in devoting the second chapter of his book to what he saw as a fundamental question in ancient (and modern) agriculture, anticipated Marxist analysis of labour (see especially Dickson 1788: 99-100).

[222] Finley 1985a: 184-185.

[223] Halstead & Jones 1989.

In 'Agriculture and Slavery in Classical Athens', M.H. Jameson argued for the widespread existence of agricultural slavery,[224] although his view has subsequently modified to focus upon the use of agricultural slaves by landowners in the hoplite class and above.[225] E.M. Wood's contrary thesis that free labour predominated in Classical Athens appears to have found relatively little support among modern scholarship.[226] This may be due firstly on the grounds that citizen ideology was constructed upon the existence of widespread slavery.[227] Secondly, anthropological studies of agricultural cycles in which little mechanisation is employed have emphasised the intensity of labour demands ('time stress') at crucial times of the year, which may have cut across ideological divisions of gender and domestic work.[228]

Although T.W. Gallant has also questioned the prevalence of slavery at the level of a 'subsistence' household, arguing that labour demands would be filled at certain key time of the *oikos* 'life-cycle' by recourse to hired labour,[229] his own model of the agrarian *oikos* has proved problematic through neglect of activities such as animal husbandry (which traditionally employed low status labour).[230] This last point becomes even more important in the light of research relevant to the role of animal husbandry in the 'alternative' model of settlement and land use.

The study of animal husbandry regimes in classical antiquity has traditionally been concerned with the existence of 'pastoral' or 'arable' economies during the Early Iron Age and its potential social significance either in relation to 'Homeric society', or with institutional matters such as grants of *epinomia* (pasturage) attested in epigraphy during the classical period.[231] Recent studies have attempted to draw the rather sparse literary testimony together with burgeoning archaeological

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[224] Jameson 1977/8.

[225] Jameson 1992, 1994a.

[226] e.g. Burford 1993: 264 n.69; Morris 1994d: 63; Hanson 1995: 65-66; Mossé 1995: 26-27; Foxhall 1996: 54. Starr 1958 for earlier arguments minimising the number of slaves in ancient Greek society (*cf.* Sallares 1991: 54-60).

[227] Finley 1981: 99-100.

[228] Anthropological interest in gender and rural labour in Friedl 1962: 23-26; Dubisch 1972: 45; Ember 1983; Gilmore 1982: 195. Halstead & Jones 1989 for 'time stress' at harvest (also Osborne 1987: 13-16; Amouretti 1991 for seasonal variations in agricultural labour) Herfst 1922: 14-15 (followed by Fitton-Brown 1984: 73) had argued against large-scale involvement of women in agricultural work (however, Just 1989: 108 on hiring of citizen women as grape-pickers in Dem. LVII.45). Scheidel 1995: 210-213, 1996: 1-5 on the participation of females in domestic and agricultural work during the lifecycle of a household (also Foxhall 1995b).

[229] Gallant 1991.

[230] Forbes 1994: 187.

[231] Hypothesis of Early Iron Age transition from pastoralism to arable interests in Snodgrass 1980: 35-6; 1987: 193-209, rejected by Burford 1993: 120. For *epinomia* see Burford 1993: 21. Georgoudi 1974 discusses *epinomia* in the Hellenistic period (*IG* IV.853.20-1; *IG* XII 7, 509 with grant of ἐν[κτ]ησιν to a Corinthian in Methana). Note Forbes 1996: 76, 'We certainly cannot be sure that such grants automatically indicate the presence of community-owned, uncultivated land [e.g. ὄρη δημόσια] ...It is not impossible that in some circumstances it meant the right to graze animals on privately owned fallow land, opened up as common grazing for part of the year...We should also not exclude the possibility, though it may be remote, that the usage of the term in some states may have meant the right to own grazing-land, differentiated from the right to own cultivated land.' On the interchangeability of lease terminology concerned with land, Whitehead 1986: 153 n.21.

and ethnographic data into a debate over the relative place of animal husbandry in the ancient economy.[232] Within this debate, two different explanatory models have emerged, although it is worth noting at the outset that both models stress the importance of animals and secondary products in the ancient economy,[233] while acknowledging the generally low status of specialist pastoralists (e.g. shepherds and goatherds) in the ancient world.[234] Views however diverge on the relationship between strategies of animal husbandry and agricultural practice.

Lack of space in certain *poleis* for 'traditional' animal husbandry — large-scale transhumance in which animals and agriculture, cultivable land and pasture were kept separate through the shepherding of large flocks and herds in summer upland pastures ('normal transhumance') — has prompted the suggestion that agro-pastoral strategies (closely associated with the 'alternative' farming model), involving relatively small herds (less than 100 head) engaged in direct manuring of arable land, may have been a viable alternative to the traditional animal management strategy of transhumance.[235] Agro-pastoral strategies (including short-distance movements of sheep and goats between arable and pasture land as a complement to fodder crops) would be especially suited to *poleis* with small territories containing significant amounts of steep, marginal land (a category in which many Aegean island polities would fall).[236] A symbiotic, rather than divorced relationship between animal husbandry and agriculture would enable more intensive cultivation, as well as serve commodity demand for secondary animal products, and cultic requirements for animal sacrifice.[237]

The traditional view of animal husbandry as a farming regime separate from (and even antagonistic towards) agriculture is maintained by some scholars, in opposition to the agro-pastoral

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[232] Osborne 1987: 47-52; Whittaker 1988; Isager & Skydsgaard 1992: 83-107; Alcock, Cherry & Davis 1994: 145-57; Forbes 1994; 1995; 1996.

[233] Isager & Skydsgaard 1992: 110-1 in contrast to earlier analyses (e.g. Bolkestein 1958: 23, 'Economically it did, therefore, not play an important role') which minimised the economic importance of animal husbandry by failing to appreciate its secondary produce, commodity value. On the importance of pastoral products within the ancient Greek agricultural commodity market, Forbes 1994: 196. Mee, Gill, Forbes, Foxhall 1991: 228-230 on pastoral 'agribusiness' in modern Methana.

[234] Jameson 1989: 11-12; Isager & Skydsgaard 1992: 99-101; Forbes 1995: 332 on the social marginality of shepherds. The opportunity of pastoralists to engage in other seasonal activities — meat, wool and hide processing for example — might also suggest that animal owners may have made use of low status workers in some numbers. *cf.* Thirsk 1984: 210 on the phenomenon of low-status pastoralists seasonally engaged as artisans of animal hides in Medieval England.

[235] Garnsey 1988: 94; Sallares 1991: 383 (Attika). Mendoni 1994: 149, 149 n.15, 153 (Keos). Reger 1994a: 167-8, 201 (Delos). *cf.* Barker 1989: 3 on small-scale, mobile systems of pastoralism in Italy.

[236] For animal management strategies where animals could be taken, 'away from the farm to graze on pastures which may have been private property, rented space, or communal land...Goats, with their browsing habits, tolerance for a wider range of foods and low water requirements, could be taken to maquis-covered hillslopes', see Alcock, Cherry, Davis 1994: 152. For symbiotic aspects of pastoralism and arable farming, see Hodkinson 1988; Chang 1992: 87, Forbes 1995: 330; Hanson 1995: 74.

[237] For animal sacrifice, see Jameson 1988; Isager 1990. For secondary animal products, Hodkinson 1988: 36 (*cf.* Strabo IX.1.11 on secondary animal products from the Cyclades used in Attic religious practices). Jameson, Runnels, van Andel 1994: 297, 'As for the techniques of intensive herding, they are inseparable from more intensive agriculture, which is also associated with outside markets and a larger population.'

model.[238] S. Isager and J.E. Skydsgaard argue that Aelian's story (*De Natura Animalium* XVI.32) of animal husbandry on Keos (from the Greek author Aeschylides) is a *mirabile* (a fantastical or paradoxical story cited for its uniqueness) and does not deserve the label of labour-intensive, integrated agro-pastoral economics, as claimed by S. Hodkinson and others.[239] Furthermore, they suggest it would be unlikely that cultivable areas would be set aside for fodder when there may already have been pressure on land resources for crop growing. However, the transhumance model, focused predominantly on mainland *poleis* with sizeable territories, does not adequately address the problem of animal husbandry in areas where long distance, seasonal relocation of animals was much more restricted.

Other literary sources are limited and contested: the case of fifty sheep, a shepherd and assistant reported stolen in [Dem.] XLVII has been cited both as evidence for and against the hypothesis of the 'agro-pastoral farm'.[240] The lack of a precise description concerning the whereabouts of the animals and their shepherds at the time of the seizure makes interpretation speculative at best, and in either case the salient point of the speaker is surely to demonstrate that the value of the animals ought not to be overlooked in comparison with the money which was owed.[241] Another unfortunate consequence is the tendency to polarise possible interpretations of animal husbandry within an almost exclusively Athenian frame of discussion.[242]

However, recent ethnoarchaeological studies, rather than foster an artificial polarisation between all aspects of transhumance and agro-pastoralism, have attempted to draw on aspects of uncultivated landscape use while interpreting animal husbandry strategies within wider domestic agricultural systems from an ethnoarchaeological perspective.[243] They note that the separation suggested between livestock and land in forensic and epigraphic sources may represent rhetorical

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[238] Georgoudi 1974; Skydsgaard 1988; Isager & Skydsgaard 1992: 99-101. The intractable opposition envisioned by Robert 1949: 169-170 on *IG* XII 7, 509 and the contested pasture of the island of Herakleia, 'Les intérêts des bergers et des cultivateurs sont contraires et irréconciliables et, quand les uns et les autres se trouvent en contact, la lutte est perpétuelle et violente' is an over-simplification (*cf.* Osborne 1987: 50). Forbes 1996: 74 (also Braudel 1972: 85-94) on tensions *between* utilisers of uncultivated land. In comparison, N.B. Biddick 1989: 1-4, 79 for the 'matrix of interactions between the pastoral and cereal sectors'.

[239] Isager & Skydsgaard 1992: 103 *contra* Hodkinson 1988: 46; Alcock, Cherry & Davis 1994: 151.

[240] Hodkinson 1988: 38 claims that the sheep were grazing near the farm; Burford Cooper 1977/8: 172 argue that the sheep were grazing on public pasture. Isager & Skydsgaard 1992: 102 argues that the separate evaluation of domestic animals from property (*IG* I^3 426.58-63) points against close interdependence of agriculture and animal husbandry. Osborne 1987: 53 sees the sheep as essentially wool producing, although this would not exclude milk products.

[241] e.g. herdsman and unspecified number of goats sold for 13 minas in Isaios 6.33; 60 sheep, 100 goats and a horse sold with land and equipment for a total of 2 talents (ἀγρὸν Ἐλευσῖνι δυοῖν ταλάντοιν, πρόβατα ἑξήκοντα, αἶγας ἑκατόν, ἐπιπλα, ἵππον λαμπρὸν ἐφ' οὗ ἐφυλάρχησε, καὶ τὴν ἄλλην κατασκευὴν ἅπασαν - Isaios 11.41). See Burford 1993: 151.

[242] Though note efforts of Osborne 1987: 49 and Alcock, Cherry & Davis 1994 to expand the discussion and allow for strategies outside Attika.

[243] See Chang 1994: 366; Forbes 1994, 1995, 1996.

and ideological divisions which may in fact have hidden a much closer economic relationship, but acknowledge that uncultivable land, situated in marginal areas often some distance from cultivated land, may have been utilised for pasture in mobile strategies of animal husbandry.[244] The cost of animals, the importance of access to grazing land, and the resources necessary to maintain sizeable flocks and herds further indicate that larger-scale animal husbandry strategies would likely have been a possibility only to wealthy individuals (in most cases synonymous with larger land owners) in a cash generating, rather than subsistence role.[245]

Indeed, the extent to which wealthier members of society engaged in market-orientated agricultural production (for example in Athens to generate cash for liturgy obligations), has brought critical analysis of earlier substantive theories of the ancient economy.[246] In particular, it is worth noting the move away from Mickwitz, Pleket and Finley's denial of 'economic rationality' in the ancient world, and the consequences for an understanding of ancient rural production.[247] By acknowledging the 'low penetration of the ancient economy by a mechanically rational technology' (e.g. reliance upon manual agricultural labour),[248] yet also situating household land use strategies within the wider social context of the *polis*, such approaches avoid a primitivist/modernist impasse between 'economic irrationality', and 'capitalistic agriculture' respectively.[249]

Scholarly dispute has revolved not only around the applicability of these respective models of land use and settlement, but also their chronology from the post-Mycenean period to the Hellenistic world. A 'static' view of land use, namely that the 'triad' of agriculture — cereal, olive and viticulture — was cultivated in essentially the same manner (together with animal husbandry) from the Dark Ages (c. tenth to eighth centuries BC) to the Hellenistic period, has been restated most recently by A. Burford.[250] This view argues that assumptions of a largely pastoral Dark Age economy (followed by an eighth-century BC agricultural revolution) are founded upon a rather selective reading of the Homeric evidence, and ambivalent archaeological and paleo-botanical evidence.[251]

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[244] Burford 1993: 123-4, 146-150; Forbes 1995: 331, 1996: 71.

[245] Forbes 1995: 332.

[246] Osborne 1991 (with reply in Whittaker 1993: 3-4, and response in Osborne 1996c: 51-52).

[247] See n.66 above. *viz.* Foxhall 1990: 113, 'Non-modern economies have rationalities that are perfectly economic, but all their own.' Likewise Amouretti 1994: 87 argues for, 'une rationalité, différente de la nôtre mais bien réelle.'

[248] Lowry 1991: 146-153.

[249] As Godelier 1972: 308 notes, reference to economic rationality or irrationality is meaningless without reference to the hierarchy of needs and values that are imposed upon individuals in a given society, 'having their basis in the nature of the structures of this society.'As such, this is consistent with substantive theories of 'embedded' economies (see n.116), but also permits evaluation of ancient 'mentalities' of production (see n.270).

[250] Burford 1993: 9, 11-13; Foxhall 1995c.

[251] Hanson 1995: 26-45 supports an eighth-century BC change from a pastoral to agricultural economy as part of a wider thesis arguing for the revolutionary effect of arboriculture upon the whole of Greek society. A very similar

It is arguable that as much as the 'static' agrarian model is influenced by the Finley view of technological stagnation and the absence of a 'productive' mentality in the ancient world (and thus ties the explanation of agrarian *intensification* solely to population increase),[252] the 'developmental' agrarian model (although more sensitive to diachronic change) tends towards a unilinear evolutionary perspective that simplifies regional trajectories in the Archaic Greek world, requiring the re-categorisation of 'rogue' *poleis* (e.g. Aegina) which do not conform to the agrarian model.[253]

Accompanying the debate over land use in the Archaic and Classical periods, there has been a revision of the traditional picture of the countryside in the later Classical and Hellenistic periods. Guiraud's emphasis upon the progressive concentration of land, an increase in servile work-force and specialisation from the fourth century BC, and the extension of pauperism in the Hellenistic world remained the dominant model for much scholarship of this century (often complemented by a modernist view of the ancient economy),[254]

> 'The economic processes that tend to explain the renewal of the acute social problem from the fourth century onwards are mainly these: the decline of the small and medium land-holding and the formation of large agricultural property, on the one hand, and the development of a quasi-capitalistic type of economy in Greek industry, on the other. These processes are to be discerned both in economically progressive states, like Athens, and in agrarian states, like Sparta, although with different emphasis and intensity....
> ...The results of the changes that occurred in the Greek economy in the first half of the fourth century were mainly these: the growth of a rural proletariat of the landless and those who had only minimal landholdings; the expansion of an urban proletariat augmented by farmers who had lost their land and went to live in cities; the rise of unemployment both in the villages, on account of the tendency of land owners to work their estates chiefly by means of slaves, and in towns, because the new-type manufacturers relied on slave-labour, and because of the basic structure of the small workshops, which from the outset did not permit the absorption of additional workers; a significant change in the distribution of wealth — land and other immovable property, movable property, and income — among citizens of the 'polis' with the concentration of

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thesis was propounded independently in the Marxist interpretation of Wason 1947: 44-45, 55, most notably the connection made between intensive, cash crop agriculture and the emergence of hoplite warfare (Wason emphasises olive cultivation, Hanson concentrates on viticulture). *cf.* Jones & Woolf 1969b who argue that an 'agricultural revolution' based on intensification was experienced for the first time in human history during sixteenth century AD Europe.

[252] Finley 1965: 29.

[253] Figueira 1981 on Aegina, which may stand as a highly relevant case study for other Aegean *poleis* with a small, circumscribed *chora*, and maritime access.

[254] Guiraud 1893: 607, 'le trait caractéristique de cette époque c'est l'extrême concentration de la propriété, et, par suite, l'extension du paupérisme. Quelques riches et beaucoup de pauvres, tel est le spectacle que nous offrent alors les cités helléniques.' Rostovtzeff 1936: 250, 'Another novelty in the economic life of the Hellenistic world was its *capitalistic* character. I cannot enter here into discussion of the real nature of ancient capitalism, a matter on which I have expressed my opinion repeatedly. The term "capitalism", as applied to the economic evolution of the Ancient world, means, to my mind, a form of economic life which was based on economic freedom and individual economic activity and which was directed towards the free accumulation of capital in the hands of individuals and groups of individuals. It was founded on rationally organized agriculture and industry, functioning not to satisfy the needs of the producers and of a local restricted market, but for an indefinite market, and tending toward mass production of specialized goods.' Bolkestein 1958: 11, 'The history of Greece after Alexander the Great offers, as far as economical life was concerned too, a disconsolate picture of a hardly interrupted decline and pauperization.' Also Heichelheim 1964: 117; Hanson 1995: 390-399.

> relatively great wealth in the hands of comparatively few, and the increase in the number of the destitute or those who possessed but little.'
> Fuks 1984: 54, 56

However, the results of the 'new wave' of archaeological survey have progressively illuminated a more complex regional and diachronic picture.[255] In mainland Greece, the countrysides of Boiotia and the southern Argolid exhibited a high number of domestic rural sites in the fourth century BC (indicative of intensive rural exploitation) followed by a sharp decline in the later Hellenistic period, part of 'a phenomenon of cyclical dispersion and contraction'.[256] These rural sites have typically been interpreted by survey teams as isolated farmsteads engaged in the production of agricultural commodities (olive oil, dyes, wool, wine, honey), based on the evidence of *in situ* processing infrastructure such as press beds.[257] The number of such sites diminishes in the third century BC with 'a new emphasis on pastoralism, which is less demanding in labour than olive cultivation and less vulnerable to depredation.'[258] This rural history is matched by patterns of 'farmstead' sites revealed by survey at Metapontum in southern Italy, where over 250 sites have been located in a 42 km^2 area of the *chora*,[259] with an especially dense concentration dated to the second half of the 4th century BC.

Thus the later Classical period appears one of unprecedented prosperity among relatively small rural sites,[260] while the pattern from mainland Greece largely fits the gloomy picture of Hellenistic 'decline and pauperisation'. However, survey of regions elsewhere in the Mediterranean has led to modification of generalised Hellenistic rural 'decline', with a more sensitive appreciation of diachronic patterns within the period,[261] as well as the transition to Roman rule.[262] Indeed the problem of diagnostic 'intra-Hellenistic' evidence may be one of the reasons why previous interpretation has tended towards treating the whole period as a monolith, and separate from the

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[255] Bintliff 1997: 10-12.

[256] Bintliff & Snodgrass 1988: 69.

[257] van Andel & Runnels 1987: 108-9.

[258] van Andel & Runnels 1987: 110.

[259] Carter 1990: 407-9.

[260] *contra* Borgeaud 1995: 292, 'After the end of the fifth century, the situation changes: landowners (even small ones) henceforth had their residences in the city and spent only certain periods of time in the country; rural residences became more modest, in a certain sense, secondary. Permanent residents of the country (there remained some, of course) were identified as rustics, the *agroikoi*, at whom the New Comedy poked fun.' *cf.* Audring 1977-8: 43-48. Steiner 1994: 216 sees a 'divided topography' emerge in the fifth- and fourth-century *polis*, but not one reducible to a simple town/country dichotomy, since as Steiner argues, the 'politically quiet' (*apragmones*) may have existed in an urban context, not merely in 'rural retreat'.

[261] Alcock 1994.

[262] Said 1987; Alcock 1993a.

later Classical period.[263] In fact, the most significant break appears later in the Hellenistic period (in the second half of the third century), with a notable continuity from the preceding period,

> 'This Early Hellenistic pattern, largely a continuation of that generally observed in the Classical period, has been interpreted to suggest intensive cultivation of an unprecedented amount of territory at this time...For the most part, small-scale landed holdings, of the type associated with 'peasant' agriculture, are believed to have been the norm in this densely populated landscape, though some larger estates must also have existed.
>
> At some point during the Hellenistic period, however, a radical alteration in the distribution of settlement and in land-use practices took place...In some of the survey projects, the change can be dated very approximately to the mid-third century BC. A sharp drop in rural site numbers, pointing to a slackening in agricultural production and therefore some measure of population decline, marks this later Hellenistic development. An increasing preference for nucleated residence, in cities or large villages, may also partly explain this trend. Of those sites remaining in the rural landscape, peasant cottages in many cases now gave way to more substantial properties, suggesting the growth of significant agricultural estates. Major reorganisation in demographic behaviour, residential priorities and land-holding patterns are thus clearly signalled during the course of this era...Certainly it is now impossible to consider the Hellenistic period in Greece as a uniform, essentially static, epoch.'
> Alcock 1994: 177-179

In the Aegean (for example Thasos and Keos) archaeological survey has provoked disagreements over the pattern of settlement in Classical and Hellenistic times, with the available archaeological data often used to support interpretations of both 'dispersed' and 'nucleated' settlement patterns.[264] In northern Keos, decreased numbers of dispersed rural sites in the later Hellenistic period followed a Classical-early Hellenistic climax.[265] On Melos, Hellenistic site numbers fell below those of the Archaic and Classical period, although the change is hardly spectacular and appears over-emphasised by the survey team, perhaps influenced by historical knowledge of the sack of Melos by the Athenians in 415 BC (Thoukydides V.116).[266]

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[263] Bintliff 1997: 10.

[264] Osborne 1986; 1987: 65-70 argues for the dominance of the urban (political) centre in shaping settlement patterns on Thasos, *contra* Brunet 1988a; 1992 and Amouretti 1994, who argue for a harmonious relationship between town and country. Cherry, Davis, Mantzourani 1991c: 337-47; Mendoni 1994: 151 n.33, 153 support the thesis of a nucleated socio-political centre in northern Keos, *contra* Papageorgiadou 1990, who argues for ekistic settlement hierarchy incorporating farmsteads, villages and *polis* centres (following Doxiadis 1968; 1972). This case neatly illustrates the difficulty of extrapolating and interpreting survey evidence, where two authors on the same survey project (Galani, Mendoni, Papageorgiadou 1987) might reach divergent interpretations of ancient settlement patterns.

[265] Cherry, Davis, Mantzourani 1991c; Bintliff 1997 for useful comparative tables of diachronic site numbers.

[266] Wagstaff & Cherry 1982. N.B. the prominence of Central Place theory in the interpretation of both northern Keos and Melos survey evidence which has led to questioning of its use as a heuristic, rather than deterministic model (Catling 1984). In particular, the under-representation of rural sites in the overall archaeological record, and the lack of differentiation between hierarchies of rural sites are two problems which Catling identifies in surveys influenced by Central Place theory. *cf.* Wason 1994: 128-131 on the assumptions that settlement hierarchy equates with political hierarchy.

However, in the Mesara plain of Crete, rural sites typically less than 30 mins walking distance from the settlement at Phaistos double in number during the Hellenistic period, and display 'a more developed hierarchy' as 'some farmsteads were situated in dry, marginal land, perhaps an indication of changing agricultural practices, local population pressure or both.'[267] The *poleis* of Amorgos, according to M.F. Boussac and G. Rougemont, appear to have enjoyed a vigorous rural prosperity in the Hellenistic period, with numerous towered sites dotting *eschatiai* areas of the respective *poleis*.[268]

CONCLUSIONS

> 'The true justification for studying rural ancient Greece is indeed, in a broad sense, historical...the archaeologist who pursues the study of rural Greece, rather than accepting the urban focus of interest of the ancient sources as a kind of datum, will in fact be probing beneath the surface of this "world of town-dwellers", and examining its economic underpinning.'
> Snodgrass 1987: 91-92

In tracing paths of scholarship in the century since Guiraud's publication, and assessing their influence on current research, Chapter 1 has illustrated the extent to which modern scholarship of the ancient Greek countryside, from its earliest formative research, has been influenced by external, contemporary political interests, as well as internal academic, interdisciplinary methods. The agrarian dimension of Classical studies does not constitute a belated response to an emergent 'environmental' movement during the last three decades, nor necessarily reflect current interest in 'fashionable' rural history, but has a more complex historiography, initially embedded in the politics of late-nineteenth century socialism, then incorporated (with some delay) into the 'primitivist-modernist' debate concerning the ancient economy.

Nonetheless, the economic geography of the ancient Greek countryside remained the province of scholars outside traditional, literary-based ancient history for much of the twentieth century. This is reflected in the predominantly institutional and juristic framework in which questions were traditionally phrased by scholars who concerned themselves with literary and epigraphic sources (to the virtual exclusion of archaeological material), combined with a conscious anti-Marxist reaction (especially prevalent among English language scholarship) against engaging in questions of agrarian history and archaeology.

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[267] Watrous *et al.* 1993: 230-231.

[268] Boussac & Rougemont 1983.

Throughout the twentieth century, the most consistent substantive attempt to investigate such questions has come from the archaeological contribution of excavations in the Black Sea area.[269] In addition, German traditions of historical geography, together with the sociological and quantitative perspectives offered by French scholarship have proved that they can continue to make an important contribution to future studies. However, only from the 1960's did the interests of some historians and archaeologists begin to converge on many of the important questions raised by Guiraud, Jardé, Heitland and Zimmern.

With renewed interest in aspects of primary production and settlement among scholars working in Marxist and non-Marxist traditions, manifested by *Problèmes de la terre*, research has largely moved away from earlier institutional approaches towards analysis of political and economic factors influencing land use and settlement, and renewed inquiries into ancient 'mentalities' towards land use.[270] Crucial to these methods of inquiry is the recognition that the *chora* provides the context to any analysis of the *polis* as an historical phenomenon,[271] and close attention to the topics — kinds of labour force, terrains and products, distances from the centre — flagged by Finley.[272]

Thus when approaching a study of the ancient Greek countryside in the less well known later Classical and Hellenistic periods, archaeological prospection offers the opportunity to assess regional variations in the extent and intensity of land use and settlement. The following case study contributes to current reassessments of the once gloomy picture concerning the countryside in this period, examining the contexts of rural sites according to several perspectives: Chapter 2 examines the insular context of the case study; Chapters 3-4 adopt a micro-level perspective towards the archaeology of individual sites; Chapters 5-7 focus upon the local inter-relation of these sites, and their wider regional context in the economic geography of the *chora*. Throughout the study, special effort has been made to maintain a perspective upon the three dimensions of a *chora*, in appreciation of the often neglected, yet important 'verticality' of many ancient landscapes.

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[269] Murray 1992: 22-23.

[270] Most notably Foxhall 1990; Brunet 1992; Burford 1993: 12, 248 n.18; Amouretti 1994; Hanson 1995. *cf.* Jardé 1925: xiv.

[271] Humphreys 1978: 124.

[272] Finley 1973b: 11.

CHAPTER 2

CONTEXT OF THE CASE STUDY

> 'The heretofore obscure histories of remote islands deserve a place alongside the self-contemplation of the European past — or the history of "civilizations" — for their own remarkable contributions to an historical understanding. We thus multiply our conceptions of history by the diversity of structures. Suddenly, there are all kinds of new things to consider.'
> Sahlins 1983: 534

ISLAND STUDIES

From the mid nineteeth-century Chian thesis of Fustel de Coulanges to recent survey archaeology, Aegean islands have remained a popular choice for regional historical, archaeological and anthropological studies, even as traditional predilections have shifted away from larger and 'historically notable' polities towards communities less prominent in the surviving literary sources.[1] A large degree of this popularity may be attributed to the tendency for islands to be viewed as paradigmatic, even metaphorical, examples of bounded regions.[2] Such ideas gained currency in the writings of travellers to the Aegean after Greek Independence, especially where phil-hellene, cultural 'survivalist' studies converged with the 'Great Idea' (*Megale Idea*) to bring the territories of ethnic Greek populations within the new kingdom. Many islands with populations that claimed a Hellenic national identity, including Crete, the Ionian and the Dodecanese islands, remained outside the modern Greek state, and thus it was not surprising that a special 'Hellenic purity' which islands might confer upon their populations by virtue of their *natural*, physical boundaries was often emphasised.[3]

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[1] Fustel de Coulanges 1856 for Chios (*cf.* Yalouris 1976); Koldewey 1890 (*cf.* Spencer 1993, 1995c) for Lesbos. For the 'new wave' of island studies, Figueira 1981 on Aegina; Renfrew & Wagstaff 1982 for Melos; Shipley 1987 on Samos; Cherry, Davis, Mantzourani 1991 for Keos. On a Mediterranean scale, the phenomenon is comparable to recent work (e.g. Tykot & Andrews 1992) that has highlighted the importance of islands such as Sardinia, previously overlooked as 'peripheral', in the Bronze and Iron Age Mediterranean.

[2] van Andel & Runnels 1987: 23 on the usefulness of an 'island' metaphor in the study of the southern Argolid, 'an island of a sort, but it is an island tied to the rest of the Peloponnese by seafaring and transhumance. This quality makes the area an excellent choice for our study of the history of rural Greece since it forms a bounded region, but one which was intermittently integrated into the flow of events in a greater and better-known world, something that would not be possible for a truly isolated island or mountain valley.' For the metaphor of the island as microcosm, Glacken 1967: 640-641 on its use by Malthus to illustrate his theories on the earth's human population.

[3] e.g. Bent [1885] 1965: v-vi. Fustel de Coulanges' diachronic study of Chios from antiquity to the present day was likewise preoccupied with 'persistance de la race' and 'régéneration de la race grecque à Chio'. *cf.* Myers 1953: 270, 'Lying most remote from those frontiers of Greek lands which have been oftenest overflowed by other peoples, these islands have preserved strains or breeds, more purely Hellenic than elsewhere.....Long immune from administrative interference under Rome and Byzantium, under the Knights, and under the Turks till mid-nineteenth century, they have conserved forms of government which have so much in common with those of the smaller Greek city-states in antiquity, that they may be regarded as direct survivors of that kind of society.'

However, the most influential popularisation of island studies came from the widespread inter-disciplinary application of Darwinian 'biogeographic' theory, in which an island formed a coherent, enclosed ecosystem where historical processes could be observed, quantified, and thence generalised.[4] An island was thus, 'an intrinsically appealing study object', since it was, 'the first unit that the mind can pick out and begin to comprehend'.[5] J.D. Evans, in applying this approach to the study of human settlement and society,[6] argued that small islands made excellent 'laboratories' for inquiry, by virtue of their natural boundaries which provided, 'an opportunity to study the related mutual development of small, discrete communities, to observe the mutual effect of their contacts, and to follow the development of differences between them.'[7]

Evans' approach stressed the role which natural land-sea boundaries might play as socio-cultural barriers upon the phenomenon of insularity (the condition of dwelling on an island), in a manner not dissimilar to the 'cultural survivalism' accorded to Aegean island populations by some earlier travellers and historians.[8] However, Febvre had already effectively criticised the contradiction of human 'insular isolation' which the Evans 'biogeographic' approach posed: maritime communications crucially altered the relationship between humans and islands after initial 'colonisation', so certain trajectories of development were exclusively open to human island populations.[9] In questioning the existence of a human 'law of the islands', Febvre's reformulation of insularity instead suggested that 'we should find

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[4] Darwin 1859: 555-556, 562, 'Islands, though in sight of each other, are separated by deep arms of the sea...the currents of the sea are rapid and sweep between the islands...so that the islands are far more effectively separated from each other than they appear on a map...We can thus understand the high importance of barriers, whether of land or water, in not only separating, but in apparently forming zoological and botanical provinces.' Thus Braudel 1972: 154, who argued that the history of islands in the Mediterranean afforded one of the most rewarding ways of explaining the history of the Mediterranean as a whole, 'like an enlarged photograph' (*cf.* Kolodny 1974: 654 on the example of Donoussa as 'un miniscule isolat égéen'). See also above pp.19-20.

[5] Macarthur & Wilson 1967: 3.

[6] Evans 1973, 1977 (*cf.* Keegan & Diamond 1987:49-51); Morey 1993: 159.

[7] Evans 1973: 519. *cf.* Evans 1973: 520, 'The potential of island habitats for the pursuit of "archaeology as anthropology" is undoubtedly very considerable. By cutting out one or more of the variables with which we normally have to contend, islands offer us the possibility of, in some senses, conducting "experiments"...By a careful choice of particular island communities for study in relation to any individual problem, results commanding a higher degree of confidence may be arrived at than would be possible using mainland evidence which is generally more open ended.' *cf.* Kirch 1986b; Cherry 1990:146-148; Gosden 1994: 22-34; Patton 1996: 25.

[8] Evans 1973: 518, 'Island communities are on the whole more open to some kinds of cultural contact than to others. For instance, though by no means immune, they are less likely than mainland ones to be affected by the kinds of contact which produce rapid and arbitrary cultural change, such as mass immigration or hostile invasion.'

[9] Febvre 1925: 219, 'We noticed that the seashores attract all those who can use them as supporting bases from which to launch across the open seas and live the adventurous life of the mariner. But, as we said before, an island is commonly regarded as the very type of an isolated domain on the seas. How are we to explain the contradiction ? We may say at once that there is nothing to explain; all we have to do is to attack the contradiction, and to try, as a beginning, to explain how the idea of insular isolation arose.' *cf.* Febvre 1925: 232, 'The idea of isolation has a meaning for him [the biologist]. He knows the natural resources of the creatures he is studying, and their powers of movement. But is the notion of isolation as simple and plain for the geographer ? A Thousand times, no. Isolation for the anthropogeographer is a very complex idea, and is not purely and simply a "natural" one. It cannot be translated into mere numbers, any more than distance, which is no longer a fixed notion, but varies continually with the progress of means of transport, their multiplication and their increase in power.'

but variety and diversity',[10] since the concept of insularity constituted a very flexible, qualitative category of description: an 'island' need not be a piece of land wholly surrounded by water (as was recognised in the meanings associated with νῆσος).[11]

The quality of human insularity is thus possibilist rather than determinist, constituting a topopsychological characteristic not readily reducible to a quantifiable pattern.[12] Although the territory of an island is usually (but not necessarily) bounded by the sea,[13] the openness to engage (or alternatively be drawn into) wider patterns of interaction means that any attribution of 'insularity' to a particular island population itself assumes the existence of a spectrum of human maritime communication. 'Insularity' in this sense is not a natural effect of geography,[14] since access to, and control of the sea (*thalassocracy*), may be viewed as a type of human resource.[15] It is a quality of relative human interaction within wider geo-political networks and as such may be subject to means of allocation and control similar to other kinds of resources (e.g. land, labour power).

Recent archaeological thought, in rejecting 'survivalist' theories, and modifying the principles of island biogeography,[16] has instead concentrated on the 'segmental' relationship of an island population within a wider, inter-regional context (since social and geographic boundaries may not of course be coterminous).[17] The segmental relationship of many Aegean island populations has, for long periods of history, been one of simultaneous dependence upon, and marginality to, an external power.[18] However,

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[10] Febvre 1925: 223.

[11] Purcell 1995b: 186; Patton 1996: 7-8 for the problem of island definition. *cf.* Whitehead 1994b: 122-123 who rejects νῆσος as a synonym for πόλις according to Stephanus Byzantinus (*Ethnika* 474.7: Νῆσος, ἡ ἐν θαλάσσῃ πόλις). Also Bergier 1989b: 2 for a reassessment of 'insular' concepts (as applied to mountains, rivers, deserts, forests) applied to natural environments traditionally conceived as barriers to the interaction of human populations.

[12] 'An island, by its very nature, is for its inhabitants a comprehensible universe.' (Sanders 1962: 8). *viz.* Febvre 1925: 225, 'It is not geography, but psychology, to which we are paying homage. For what finally matters is the idea adopted by the people—the political group—with regard to their geographical position, of its characteristics and advantages or inconveniences, though this idea may be quite wrong or have no basis in reality.'

[13] However, see n.11 for other kinds of non-maritime 'islands'.

[14] *cf.* Fotiadis 1995: 70-71 on the politics behind the attribution of 'natural marginality' to certain regions.

[15] Patton 1996: 25 for access to, and social control of, maritime resources.

[16] Patton 1996: 25, 190, 'Whilst the theory of island biogeography has made a considerable contribution to archaeological studies of island populations, it cannot account for the full complexity of the factors involved in the human colonisation of islands, and in the subsequent development of island societies...Studies based upon island biogeography theory have tended, not surprisingly, to focus on the dynamics of human societies....island studies can make an equally important contribution to understanding the dynamics of intra-communal and inter-communal social relations. There is no simple dichotomy, however, between studies of human ecology and studies of human society: ecological and social relationships are linked by a complex web of interconnections.'

[17] Souyoudzoglou-Haywood 1990: viii, 'A common situation [of island studies] is the use of apparent geographical barriers...to bound a social group. While presenting convenient parameters for investigation, they may contain only a segment of a group linked in a broader network.' Thus Sutton 1991: 402, 'In short, the settlement pattern of contemporary Keos makes little sense if the mapping stops at the boundaries of the island. It can best be understood as a small, dependent segment of a larger map.' *cf.* Wallerstein 1974: 98; Bintliff 1997: 17-20.

[18] 'Both in the sense that the islands have existed for centuries on the margins of various empires and in the sense that they have existed on the margins of Western history, caught up in the West's politics and conflicts, but seldom if ever playing any decisive role.' (Dubisch 1995: 130).

it has been suggested that at certain times, a phenomenon of 'peer-polity interaction' may best describe the relations of Aegean communities, when independent, socio-political units existed within an integrated network, without the hegemony of any dominant polity.[19]

However, such a theory appears difficult to apply to Classical and Hellenistic Aegean *poleis* and associated institutions (e.g. the League of Islanders during the Hellenistic period). Firstly, there were major discrepancies in size and resources of alleged 'peers',[20] and secondly some 'peer' *poleis* may not have enjoyed the autonomy and sovereignty upon which 'peer polity interaction' is predicated (quite apart from the existence of networks of dependency and coercion, such as the Athenian Empire).[21]

The complexity of this relationship between humans and the sea in antiquity can be gleaned from ideologies propounded in classical literature concerning topopsychological attitudes towards the sea, maritime activities and the inhabitants of islands.[22] The almost wholly negative portrayal of islanders in Athenian literature of the fifth and fourth centuries BC (which emphasised their wretchedness, powerlessness and untrustworthiness in relation to both Persian and Athenian power) became a *topos* of later literature.[23] Most noteworthy of this *mentalité* is the moral classification of 'islanders' (νησιώται) according to a collective socio-geographic identity which is used in comparison to ethnic identities, and is best understood in the context of Athenian imperialist ambitions.[24]

By virtue of their ambivalent quality — being both of land and of the sea — islands and islanders are thus salient in any analysis of land and sea (and those who respectively exploit them) in ancient Greece. The relationship has often been interpreted as a structural polarity, for example between *georgoi* ('workers of the land') and *thalassioi* ('sea people').[25] When discussed in the context of the ancient economy, the polarity is commonly represented as a division between 'agrarian' and 'maritime'

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[19] Renfrew 1986: 1, 'Peer polity interaction designates the full range of interchanges taking place (including imitation and emulation, competition, warfare, and the exchange of material goods and of information) between autonomous (i.e. self-governing and in that sense politically independent) socio-political units which are situated beside or close to each other within a single geographical region, or in some cases more widely.' For its application to the Cyclades, Renfrew 1982.

[20] For *poleis* in Classical Greece, see Amit 1973: 7; Nixon & Price 1990: 165.

[21] Hansen 1995b.

[22] Rostovtzeff 1944; Ober 1978; Figueira 1981: 166-170; Rougé 1981: 11-12.

[23] *viz.* the inhabitants of Seriphos, who became a byword for insignificance, were the subject of an eponymous play of Aristophanes. Thoukydides VI.85 for islanders who are 'easily captured' (εὐλήπτους). Dem. XIII.34 uses the token examples of Siphnians and Kythnians to contrast with Athenians. Antiphon fr.51 for the 'poverty of territory' used as a rhetorical argument (Nixon & Price 1990: 150). *cf.* Isokrates *Panegyricus* 132 on the farming of mountains by islanders due to lack of land (τοὺς νησιώτας...ὁρῶντας τούτους μὲν διὰ σπανιότητα τῆς γῆς ὀρη γεωργεῖν ἀναγκαζομενους). Aiskhines II.71 for 'wretched islanders' (ταλαιπώρους νησιώτας). Arrian I.9.5 for the historical insignificance of the sack of Melos as mere islanders (although the fact that the Melians and Skionians are mentioned at the end of a long list which includes the Sicilian expedition, Aegospotami and Leuctra suggests otherwise).

[24] See Thoukydides VI.77 for the speech attributed to Hermokrates the Syracusan. 'Islanders' are slaves, and as such are compared to Ionians and Hellespontians and contrasted with Dorians.

[25] Thoukydides I.142.7 (see Zimmern 1931: 24).

poleis.[26] However, M. Herzfeld has warned against 'an excess of generalization' when using complementary oppositions (e.g. land:sea); polarities may sacrifice *complementarity* to *opposition* and 'so lose their significance as essentially manipulable and rhetorically subtle symbols.'[27] The complexity of the relationship between 'agrarian' and 'maritime' aspects of the ancient economy among *poleis* was acknowledged by Finley.[28] However, analysis was not pursued beyond the linkage of 'agrarian' with *poleis* which aimed at autarky (via the agricultural produce of their territories, with shortfalls supplemented by 'import interests'), 'maritime' with 'commercial' *poleis* (including several island *poleis* such as Aegina, Samos, Chios), and an undifferentiated mass of *poleis* with 'mixed' economies.[29]

The study of a countryside in which its inhabitants had the opportunity to participate in both 'agrarian' and 'maritime' activities therefore makes the selection of an island location particularly suitable. By adopting a problem-orientated approach — focused on the functions of rural sites in the ancient Greek countryside — the regional dimension of the study does not become a 'tell-all-you-know' pseudo-history of an individual *polis*,[30] but rather provides the context for examination of the full range of agrarian and maritime opportunities in relation to economic geography.[31]

SIPHNOS

> 'It is then to be regretted that while their treasury at Delphi is the subject of continual scholarly attention and debate, the very patrons of this key monument in archaic Greek art are largely ignored.'
> Sheedy 1992: 107-108

The choice of Siphnos as a case study for investigation of research problems concerning the ancient Greek countryside — town-country relations, land use, settlement patterns — has several advantages. Along with many other *poleis* of classical antiquity, the territory of Siphnos encompassed less than 100 km^2, immediately setting it in sharp contrast to the countryside of Attika, which covered nearly 2,500

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[26] Vidal Naquet 1990: 80 (*cf.* Finley 1985a: 131).

[27] Herzfeld 1986: 215.

[28] *viz.* Finley 1985a: 129, 'The dialectics of the town-country-sea relationship are complex, the tempo of development slow and sometimes abortive.' *cf.* de Ste. Croix 1981: 11 on the opportunity which coastal locations offered for the redistribution (both purchasing and selling) of agricultural produce.

[29] Cartledge 1983 on 'import' and 'commercial' interests.

[30] Finley 1981: 19-20, 1985b: 61-66.

[31] A local history, *Annals of the Siphnians* (Σιφνίων Ὧρους) by Malakos is mentioned in Athenaeus *Deipnosophistae* VI.267 (=*FGrH* 552). Meliarakes 1874: 41-45 provides an antiquarian study of ancient literary sources relating to the island in classical antiquity. Pollak 1896 surveys antiquities (archaic terracottas, marble statues and fragments of sculpture on Kastro) discovered up to the end of the nineteenth century AD. Daux 1970 provides a summary of epigraphy.

km^2.[32] Its political history appears one of varying autonomy and dependency throughout the Archaic, Classical and Hellenistic periods, in common with many other *poleis* in the Aegean.

In Archaic times, its islanders appear outward looking in several directions, articulated most prominently through the construction of a treasury at the Panhellenic sanctuary of Delphi in the late-sixth century BC (itself symptomatic of prosperity arising from the circulation of its silver resources).[33] Aegina appears one, though not necessarily exclusive, destination of Siphnian silver.[34] The style of Siphnian stone work and pottery suggests connections with Attika,[35] Paros and Melos,[36] as well as a more general eastern cultural influence.[37]

In the fifth century BC, tribute-quota lists of the first Athenian Empire suggest that the *polis* was among the upper 20% of contributors,[38] although it has been suggested (on the grounds of absenteeism) that Siphnos was among several Aegean *poleis* to show disloyalty in the 450's BC.[39] Repeated *stasis* between democrats and oligarchs on Siphnos during the early-fourth century BC makes it clear that oligarchs at least could expect to look east to Paros, south-west to Melos, and north-west to Troizen and Aegina for assistance.[40] Siphnos also appears closely connected with Keian political institutions by law,[41] and may also have shared other institutional arrangements with Seriphos, the neighbouring island to the north.[42] By the early Hellenistic period, further indication of connections with the eastern Argolid is evident in a decree about a temple of Pythian Apollo which involves Hermione, as well as the *polis* of Tenos further north in the Aegean, and Eretria on Euboia.[43]

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[32] However, see above p.21.

[33] Her. III.57-58; Daux & Hansen 1987.

[34] Kraay 1976: 45; Gale, Genter & Wagner 1980: 34-42.

[35] Sheedy 1992: 115 (*cf.* Crome 1935/6) suggests that the presence of an Archaic marble herm at Kastro was, 'the result of some special (and perhaps official) tie or relationship. The "herm" is such a distinctly Attic creation that its early appearance on Siphnos must be of some purport.' *cf.* Fuchs & Floren 1987: 172-176. Kallaiskhros the Siphnian and his son Stesileides (*SEG* **28**, 130.4-5, 132.29; see respectively Lalonde, Langdon, Walbank 1991 **P29**.4-5, **P18**.63) are the only metics mentioned in surviving 4th-century BC Attic mines leases.

[36] Her.III. 57-58 on Parian marble in public buildings on Siphnos. The provenance of Archaic 'Siphnian style' pottery (bearing a 'noughts and crosses' design) may in fact be Melian in origin. I am grateful to Richard Catling for this information concerning his ongoing work with Peter Day.

[37] Kontoleon 1970: 63-64, Sheedy 1992: 115 argue for the presence of Parian workmanship and materials in the archaic Siphnian *polis*, Brock & Macworth Young 1949: 19-20 for parallels with Naxian pottery. For the eastern influence of Archaic lion and sphinx sculptures found in Kastro, Sheedy 1988; Ridgway 1993: 221.

[38] Meiggs 1972: 558-9; Nixon & Price 1990: 142.

[39] Lewis 1994.

[40] Isokrates XIX (*Aeginetikos*).

[41] Isokrates XIX.13, 'λαβὲ δή μοι καὶ τὸν Κείων νόμον, καθ' ὃν ἡμεῖς ἐπολιτευόμεθα' (*cf.* Figueira 1981: 331).

[42] Ogden 1996: 283 on the question of metroxenic citizenship and an agreement of *epigamy* ('intermarriage') which arises from the speech, where children by a woman of Seriphos are claimed as legitimate Siphnian citizens.

[43] Daux 1970: 68-70. From the surviving text it is not clear whether the Apollo temple refers to Siphnos or elsewhere (Daux suggests Delphi). Étienne 1990: 204 Table 2 for Hellenistic Siphnian coinage on Tenos.

The political situation of the Cyclades during the Hellenistic period is much debated by modern scholars, a consequence of the exiguous historical narrative and the difficulty of dating the epigraphic material.[44] Recent reassessment of the political history of the period has suggested that successive Makedonian and then Ptolemaic control in the first half of the third century BC (the 'Nesiotic League') was followed by a period of independence from approximately 250-200 BC, with subsequent control by the Rhodians organised around a League of Islanders until 167 BC.[45] However, as G. Reger acknowledges, the case for independence, as opposed to control by either Makedonian, Ptolemaic or Rhodian powers, depends upon often recalcitrant historical and epigraphic sources, although the epigraphic evidence of *asylia*, *proxenia* and *isopoliteia* decrees may suggest the lack of a hegemonic power during this period.[46]

Despite these scholarly differences over the interpretation of the political situation, there does however appear to be a consensus on the general socio-economic situation, which may be characterised as one of simultaneous prosperity and insecurity — themes which are investigated in the following chapters.[47]

THE PHYSICAL ENVIRONMENT

The worthlessness of Siphnos in terms of its geography — akin to a knuckle-bone die (Strabo *Geography* X.5.1), evoking an image of a hard and bony, sharp-edged section of skeletal material — and also its human population (notorious for both their untrustworthiness in Athenian eyes), was a *topos* among classical literary sources as an example of *hubris*, which had transformed the position of its inhabitants from a state where they had once been 'the wealthiest of islanders' (Herodotos III.57) due to the exploitation of mineral resources in their *chora*, to a state of divinely imposed poverty (Pausanias X.11.2).[48]

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[44] Holleaux 1952: 124-145; Rostovtzeff 1953: 189-247. See now Reger 1994a, 1994b; Sheedy 1996 with bibliography.

[45] Reger 1994b: 35, 'Indeed, the best reconstruction of the political history of the Kyklades in the second half of the third century attributes to them political independence from the great powers and a degree of isolation.' *cf.* Ehrenberg 1969: 129-130. Fraser & Bean 1954: 154-162 (*cf.* Sheedy 1996) on the formation of the Nesiotic League and League of Islanders, emphasising discontinuity between the two organisations. The evidence for Siphnian membership of the former (*IG* XII 5, 481) is not as compelling as for the latter; Étienne 1990: 115 argues that Siphnos was part of the Rhodian *koinon*, according to the request of a Siphnian ambassador for a place to erect federal decree (*IG* XII 5, 817.32). Brulé 1978: 63-64 suggests that the enslavement of Siphnians by Cretan pirates in the second century BC (Diodorus Siculus XXXI.45) was a deliberate action against a Rhodian ally.

[46] Reger 1994a: 62 n.53, 1994b: 68.

[47] See especially Boussac & Rougemont 1983. Reger 1994b: 46, 61-2, in attributing a degree of independence to Cycladic *poleis*, sees in localised production unsullied by tax demands, 'a rare respite from foreign domination which permitted them to concentrate on their local economy, and introduced a spate of prosperity that, for once, did not go to feed the exchequers of the great Aegean powers.'

[48] Dem. XIII.34 for a 4th-century Athenian view of Siphnian insignificance. Plutarch *de Herodoti malignitate* 28; Libanius *Or.* XLVI.29.15; *Anthologia Palatina* IX.421; *Souda*, s.v. Σίφνιοι. For discussion of the *topos*, Ashton 1991: 12-

However, the pre-occupations of ancient literary sources are unlikely to do full justice to the resources of the Siphnian *chora*. The following sections therefore provide a description of the physical environment of Siphnos as a prelude to the analysis of rural sites in subsequent chapters. Caution is required when appreciating the limits of this evidence and its relevance for antiquity. In the case of population dynamics, land use and environmental change there is often a temptation to give a description of modern conditions, for example the type and distribution of cereals under modern cultivation, or recent population figures, and pass them off as a 'blueprint' for antiquity.[49]

There is increasing recognition that certain current environmental conditions (e.g. winds) may bear similarity with those of antiquity, while others, such as patterns of land use or coastal environment, may have experienced changes (in some cases considerable and abrupt), due to both anthropogenic and environmental influence.[50] It is for this reason that local resources — minerals, land, water sources, communications — are each treated in turn below after a general description of physical geography, in order to assess the environmental parameters of different micro-regions in the island when the location of rural sites is analysed (Chapters 5-7).

PHYSICAL GEOGRAPHY

Siphnos lies 37° N, 24° E in the west of the group of islands which comprise the Cyclades, approximately 12 kms from Kimolos to the south-west, 13 kms from Seriphos which lies to the north, and 17kms from Despotikon, Strongylos and Antiparos to the east.[51] The eastern coast of the Peloponnesian mainland lies approximately 150 kms to the west. The surface area of Siphnos comprises 74 km^2 plus the islet of Kitriani, approximately 0.5 km^2 in area, making the island comparable in size to Seriphos, Syros and Mykonos of the other Cycladic islands.

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20. For the vocabulary of Strabo's later description, *cf.* Plato *Critias* 111 on the 'skeletal' Cyclades in 4th-century. As Heichelheim 1964: 110 and Rackham 1982: 177-9, 1990: 96 note (*contra* Hughes 1994: 73), this passage may have less to do with degradation of the physical environment than with the need for an expedient (but not necessarily historical) didactic stereotype. Brunet 1988: 205 likewise notes the discrepancy between rhetoric and reality in her study of Delos, with similar literary observations about the poverty of that island (Callimachus Hymn to Delos line 11, Homeric Hymn to Apollo line 60).

[49] See above pp.30-31. Brun: 1993: 224 on discontinuities of settlement and population, society and social structure in contrast to the assumptions of Ruschenbusch 1983: 171-172, Starr 1992: 10 who base estimates of *polis* populations on 19th- and 20th-century census figures of the Aegean islands. This is satisfactory only as an index of recent depopulation, not as a guide to ancient demography. Thus Kallet-Marx 1993: 63, who correctly points out the problems in Ruschenbusch's methodology, which assumes that the modern population figures of the late 19th and early 20th century offer a direct parallel with antiquity. Dubisch 1995: 273 n.2, 'Greek census figures must be used cautiously. Individuals are listed as living where they are registered to vote, since many migrants continue to stay registered in their community of origin (returning to their home community on election day). *cf.* Wagstaff 1975: 166; Slaughter & Kasimis 1986: 104-107 for approaches to the use of census data.

[50] As was noted in antiquity, *viz.* Herodotos II.10, Thoukydides II.102 on the formation of the Echinades islands in the Akhelous river (Akarnania) by alluvial deposition.

[51] Philippson 1901: 58; Admiralty Hydrographic Office 1945: 467; Matthäus 1985: 17.

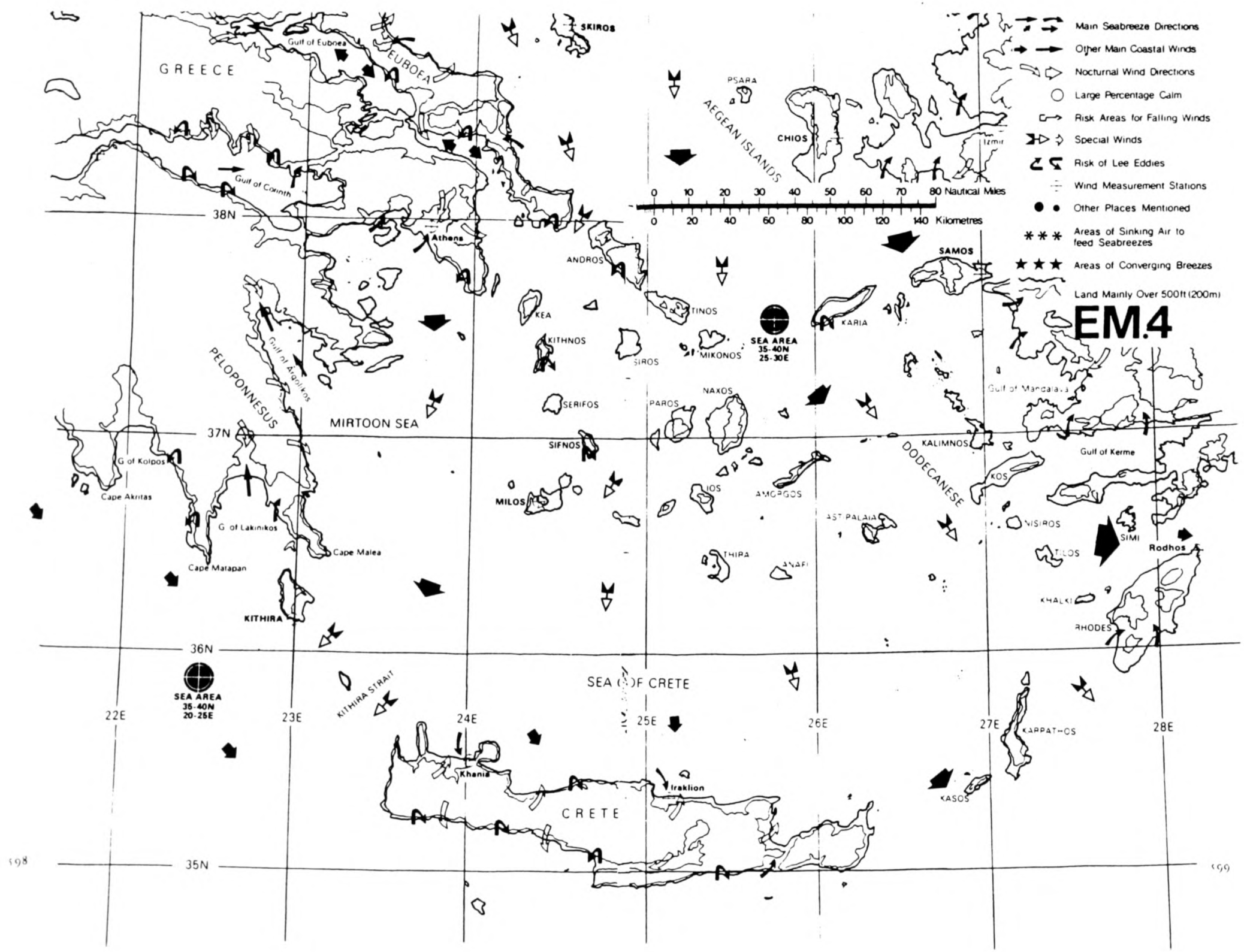

FIG.2.1: *Map of Aegean (after Watts 1975), featuring wind directions.*

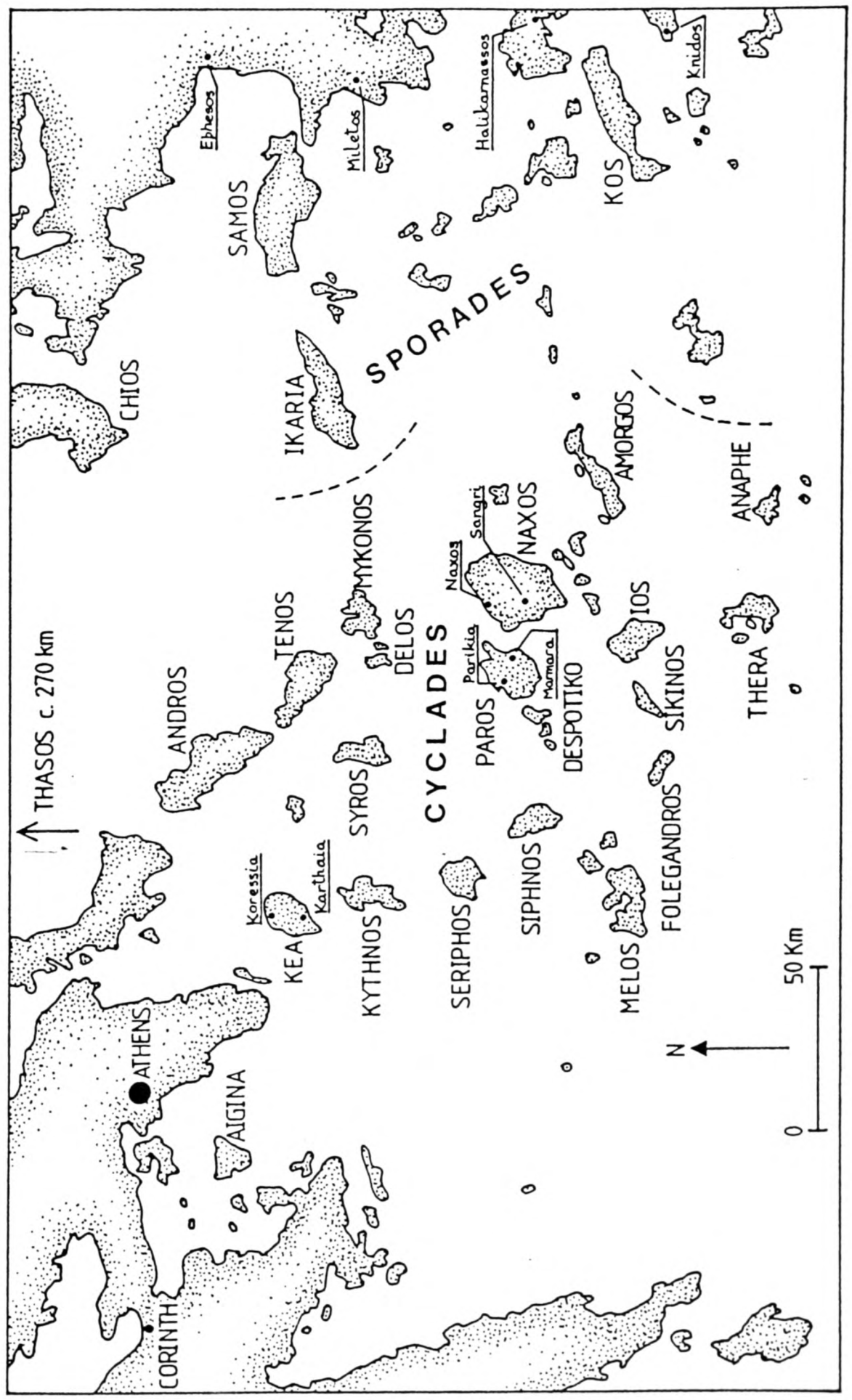

FIG.2.2: *The Cyclades (after Marcus Lodwick 1996).*

The island forms a broadly triangular land mass 16 km north-south by 8 km east-west at its maximal points tapering considerably in the north-west and south-west of the island (no point of the island is more than 3.6 km from the sea).[52]

The physical geography of the island is marked by a series of mountainous ridges running north-west to south-east which produce a marked division between the rugged western side of the island (typical gradients 30-50%) and flatter eastern areas (gradients less than 10%), with northern areas connected to the south by a long corridor along the eastern side of the island (the Troulaki valley).[53] The ridge of Ayios Simeon runs north-west to south-east along the north side of Kamares bay, reaching over470 m above sea level (*Pl.I.1*). On the eastern side of the mountain lies the Troulaki valley, bordered on its eastern side by a series of slopes which rise to a height of over 400 m at Ayios Nikitas, narrowing together to the north of Troulaki as the land tapers towards the northernmost point of Ayios Yeoryios in a series of precipitously sloped coastal inlets and undulating hills. Immediately to the south-west of the Ayios Simeon ridge lies the Kamares valley, which runs south-east for a distance of over 2 km.

The mountain ridge of Profitis Elias forms a steep south-west side to the Kamares valley, with a peak of 696 m, effectively straddling the centre-west of the island (*Pl.I.2, I.30*). The ridge is intersected by a narrow valley running east from the modern village of Katavati (*Pl.I.13*). To the south lies a continuation of the ridge (Ayios Andreas at 430m, Platia Rakhi at 560 m) which gradually diminishes into the hills of the south coast down to the bay and flat coastal area of Plati Yialos. South-east of the Kamares valley is the flattest area of the island, which contains most of the modern-day village settlements and population. A number of small plateaux, interspersed with hills, occupy the central south-east area to the south and east of Katavati and Exambela (*Pl.I.31-32*). The only other flat pockets of land in the island are to be found at Vathi and Fikiadha bays in the south-west, and around the modern village of Troulaki in the north.

CLIMATE

In evaluating the local climate of Siphnos, the following discussion begins with a Mediterranean 'macro-view' of meteorological conditions, before considering Aegean, Cycladic and local variations respectively in order to establish local factors which may contribute to variations within the general conditions.

The present climate of the Mediterranean, with its typically hot, dry summers and mild, wet winters, is considered to be broadly similar to conditions in antiquity, although some meteorologists have

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52 Riedl 1983: 11.

53 von Foullon & Goldschmidt 1887: 23-4; Riedl 1983: 11-14.

suggested that conditions may have been cooler and wetter.[54] In winter months (November-February), when the heaviest rainfall occurs, the area is subject to low pressure and cyclonic depressions which move eastwards across the Mediterranean.[55] In spring (March-May), the polar front and its accompanying westerlies move northwards, being replaced by ridges of high pressure and dry north winds which dominate in the summer months (June-September), with northerly winds (ancient *etesian* winds now known in the Aegean as *meltémi*) blowing strongest in July and August.[56] In the autumn, as the Atlantic high pressure is displaced by low pressure and cyclonic disturbances, depressions move in from the west.

However, within this 'Mediterranean' climate there are considerable inter- and intra-annual variations in rainfall and temperature, which can play a critical role in affecting patterns of annual agricultural production.[57] Even short bursts of unseasonable precipitation (often in the form of violent downpours and hailstorms), or a severe spring frost can have potentially disastrous effects on the harvest.[58] Given the added factor that storms can be highly localised, consideration of regional and micro-regional variations, such as relief and aspect, can illuminate the local micro-climate.[59]

Approximately 80% of annual precipitation in the Cyclades falls between October and March, with the driest period of the year occurring between the months of June and September, when on average less than 25mm of rain may fall. There are approximately 70 rain days per year,[60] of which fewer than 8 on average occur between June and October. The Cyclades typically receive over 3,000 hours of sunshine per year, marked by clear skies during anticyclonic weather in both summer and winter.[61] Seasonal temperatures vary between a mean low of 10-11°C in January, rising to an average 13-14 °C in March, 16-17°C April, 19-20°C in May and early June, peaking in excess of 25°C in July and August (although

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[54] Admiralty Hydrographic Office 1945 vol.3: 490; Rackham & Moody 1996: 39. Lamb 1977: 3-5, 424-435 argues that current conditions are generally warmer and drier than during the first millennium BC (*cf.* Goudie 1992: 167; Isager & Skydsgaard 1993: 11, 'It would be dangerous to postulate that no climatic changes have taken place in the span of time between antiquity and today. It is well known that we have witnessed changes in climate also in historical periods, but every attempt to demonstrate that climate in ancient Greece was essentially different from that of our time has failed. We have to conclude that no methods are available to measure changes in climate and therefore, *a priori*, that climate is not likely to have changed radically.').

[55] Mariolopoulos 1925: 22; Wigley & Farmer 1982: 13 fig.1.3, 21-22 fig.1.6; van Andel & Sutton 1987: 6.

[56] Philippson 1948: 24; Furlan 1977: 218.

[57] Wigley & Farmer 1982: 18 for definition and discussion of 'Mediterranean climate'.

[58] Xenophon *Oeconomicus* V.18; Theophrastos *HP* VIII.7.6 for the proverb ἔτος φέρει οὐχὶ ἄρουρα ('It is the year which bears, not the soil'). *cf.* Mariopoulos 1925: 28 for maximum recorded precipitation in one day in the Cyclades, including 65mm for Naxos which fell in late May 1897. Shipley 1987: 272; Hanson 1995: 155-8; Osborne 1996c: 53-55 for crop damage caused by unseasonal weather.

[59] Shipley 1987: 271 notes the problem of assessing meteorological data from modern weather stations where altitude may play a significant role in local rainfall.

[60] Mariolopoulos 1925: 18-19; Furlan 1977: 207.

[61] Furlan 1977: 213.

northerly winds may provide a cooling effect, depending on their strength), before dropping below 20 °C in October with the onset of autumn.[62]

Within the Cyclades, the western islands of Keos, Kythnos, Siphnos and the Melos group generally receive low rainfall, making it one of the driest areas in Greece.[63] For Siphnos, the average annual rainfall has been cited at approximately 400-500 mm per year, although inter-annual variability means that there may be a 25% chance rainfall may total less than 350 mm in any year.[64] However, there is local variation according to relief and aspect, an effect which has consequences for the retention of water and accessibility to water sources in areas of the island.[65] The northern promontory and west coast of the island receive the greatest exposure to winter depressions, while land east of the Profitis Elias ridge falls in a rain-shadow.[66] The lower extremes of temperature are rare - the last recorded fall of snow which lay on lowland areas of the island occurred in January 1968 - although winter frosts are more common.[67]

GEOLOGY

General description

The geology of Siphnos provides an important basis for understanding the distribution and accessibility of natural resources (such as minerals) in the *chora*, as well as illuminating hydrological patterns relevant to settlement and agriculture. Ancient literary sources (Herodotos III.57-58, Pausanias X.11.2) paint a vivid, if impressionistic picture of the Siphnians' erstwhile precious metal reserves which were worked in the Archaic period, and possibly also later in the Classical and Hellenistic period. Other writers offer cryptic reference to a local stone commodity (Theophrastos *de lapidibus* VII.42, Pliny *Natural History* XXXVI.159) which appears to have been exploited. However, the results of archaeological and topographical investigation can provide more reliable information not only about the location of the famed mines, but also of other potentially exploitable surface and sub-surface resources, including other minerals such as iron, clay and stone, and accessible water supplies (*Figs. 2.3-2.4*).

The island of Siphnos forms part of the Aegean crystalline belt, a geological complex comprising a lower unit of metamorphosed carbonates, silicic sediments and volcanites, and an upper unit of

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[62] Philippson 1948: 38-41.

[63] Philippson 1948: 192.

[64] Philippson 1948: 83; Furlan 1977: 204; Riedl 1983: 14-15. Mariopoulos 1925: 17 sets Siphnos within the band of approximately 500mm rainfall per year based on weather records from Syros and Santorini between the years 1894-1929. No local published meteorological records are available (the nearest weather stations in Cyclades situated at Melos to the south-west and Syros to the north-east).

[65] See p.67 below in relation to the hydrology of Siphnos.

[66] For the shortage of water supplies in Kastro, Tournefort 1741: 184-185; Pasch di Krienen 1773: 112-113.

[67] I kindly owe this local information to Evangelos Pantazoglou. Mariopoulos 1925: 32-4 Tables IV-V for recorded snow and hail days (*cf.* Philippson 1948: 115-134). Weather stations at Syros, Naxos and Santorini all recorded 1 or more day of hail in May during the early decades of the 20th-century.

intrusive granites and crystalline rocks.[68] The complex tectonic structure of the island is due to repeated uplift (creating mountain ridges), faulting and folding, which has produced a variegated series of crystalline limestone and schist layers with metamorphic rocks widely exposed (*Fig. 2.3*).[69] The island is geologically distinct from the volcanic islands of the Melos group to the south-west, and the area of schist (approximately 20km^2) is notable in comparison to other neighbouring Cycladic islands to the north and east, where limestone formations predominate.

There are four basic geological zones in the island.[70] An upper marble layer in the northern-most area of the island around Kheronisos forms a characteristically bare landscape (*Pl.I.47-50*). Immediately to the south lies an upper blue-schist layer, approximately 400 m thick, occupying the area between Kheronisos and Troulaki to the south (*Pl.I.19-21*).[71] The main marble complex (including some untransformed grey limestone), approximately 800m thick, stretches across the centre and west of Siphnos (*Pl.I.1-2*). A series of gneiss-lower schists, approximately 350 m thick, are exposed in the east of the island (*Pl.I.32*), although lower schists also protrude throughout the island, most prominently along the west coast (*Pl.I.36*) and in the Troulaki valley (*Pl. I.22-23*).[72]

The *long durée* and environmental change

A review of the geological formation of Siphnos with regard to its resources in antiquity must also take into consideration the constant transformations of its inhabited landscape since antiquity. The problem is complex, and there is considerable scholarly disagreement over the causality to be attached to climatic or anthropogenic causes and their supposed effects upon the long-term environmental history of mountains, valleys and coasts through soil erosion, alluviation and sea-level change respectively.[73] Some scholars have argued that, 'deforestation, overgrazing, and erosion produced the most visible, far-reaching, and relatively permanent changes in the Mediterranean landscape of all those caused by human activities in ancient times' and would go as far as to attribute a causal relationship between such environmental degradation and 'the decline of classical civilization.'[74]

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[68] Bintliff 1977: 33; Altherr, Schliestedt, Okrusch, Seidel, Kreuzer, Harre, Lenz, Wendt, Wagner 1979: 245, 254; Marinos 1982; Vavelidis, Bassiakos, Begemann, Patriarcheas, Pernicka, Schmitt-Strecker, Wagner 1985: 59-60.

[69] Vavelidis, Bassiakos, Begemann, Patriarcheas, Pernicka, Schmitt-Strecker, Wagner 1985: 61.

[70] von Foullon & Goldschmidt 1877: 24; Philippson 1952: 76; Higgins & Higgins 1996: 176.

[71] Higgins & Higgins 1996: 176.

[72] von Foullon & Goldschmidt 1877: 25; Philippson 1952: 77; Vavelidis, Bassiakos, Begemann, Patriarcheas, Pernicka, Schmitt-Strecker, Wagner 1985: 60; Higgins & Higgins 1996: 176.

[73] Davidson 1980: 147; Isager and Skydsgaard 1993: 11. Soil erosion here is to be differentiated from 'erosion' which can encompass general weathering of stone: soil erosion involves the movement of soil down a slope, leaving the underlying bedrock bare (Zangger 1992a, 1992b).

[74] Quotes from Hughes 1994: 2, 90 (see also 82-85). Hughes 1975a, 1975b, 1976: 337-342, 1983: 437 for the 'inexorable deforestation of the Mediterranean area' (*cf.* Rodman 1976). Similar sentiments (traceable at least as far as Bolkestein 1958: 3) in Hughes & Thirgood 1982; Thirgood 1982: 6-84; Meiggs 1982; Pound 1987: 17-18; McNeill 1993: 72-84. N.B. Vita-Finzi 1969: 105-111 for a more critical review of the evidence. Wertime 1983 makes the case for industrial activities as the prime consumer of Mediterranean forest in antiquity, with goats a secondary influence, citing

Key to such an interpretation is the perceived widespread, indiscriminate felling of trees for a number uses, such as for pyrotechnologic industries or timber construction, without management of wood resources through re-growth and coppicing. It is argued that such a process would lead to accelerated denudation of hillsides due to the absence of tree roots and their water retaining properties, thus leaving the thin topsoil on predominantly limestone formations vulnerable to be washed away by torrents, causing devastation where timber has been cut, as was observed in antiquity.[75]

The chief culprits in hindering any environmental recovery from anthropogenic degradation are held to be sheep and goats, engaged in long-term over-grazing of hillsides where they, 'together can strip a hillside bare, opening it to erosion, driving away competing wildlife, and forcing the whole ecosystem to regress down the scale of succession and energy', resulting in a scrub landscape of *maquis* and *phrygana* (garigue) on severely eroded hillsides.[76]

However, even advocates of such a scenario of environmental history admit that such *maquis* formations, rather than being the necessary consequences of deforestation, may instead be the vegetational climax 'under the prevailing conditions of soil and climate'.[77] To imagine the limestone formations of the Cyclades thickly forested and covered in rich soil during antiquity may be nothing more than a retrojected fallacy when in fact 'the characteristic barren and thin-soiled appearance of south-east Greece and the Aegean islands is largely a product of the Mediterranean climate and owes little to the hand of Man.'[78] Furthermore, recent large-scale soil erosion, for example sheet erosion where whole layers of earth are removed and trees uprooted by water torrents after a storm, is more likely to be a result of modern terrace building techniques using bulldozed earth rather than stone walling.[79]

In addition, domestic fuel, or ceramic production does not provide a sufficient reason to hypothesise wholesale deforestation. Although several tonnes of fuel may have been required annually by a household, *maquis*, olive cuttings, straw and animal dung might be used for domestic fuel.[80]

Eratosthenes' description of the thickly forested landscape of the past in Strabo XIV.6.4-6 as an example of 'occasional flashbacks of discerning writers'. In fact, this tradition of moral speculation about the past is as much a feature of Hesiod's 'Ages of Man', Thoukydides' *Archaeologia* or Plato's description of Atlantis, than about accurate perception of environmental history. See comments of Rackham above in n.48.

[75] Pliny *NH* XXXI.30.

[76] Hughes & Thirgood 1982: 64-5; Hughes 1994: 77-79; Wertime 1983: 452 for the goat as an 'accessory waiting for his moment to consolidate the damage', *contra* Rackham & Moody 1996: 112-116 for the more selective browsing habits of goats. Huxley & Taylor 1977: 21-23 on the botanical composition of *maquis* and *phrygana*.

[77] Hughes 1994: 16-17. Olives and junipers together with other fruit and nut trees (e.g. chestnuts suggested by the toponym Καστανάς around the vicinity of tower **11**) ought to be seen as part of the overall 'wooded' landscape (Rackham & Moody 1996: 110 for the difficulty of defining, and quantifying what constitutes a 'wood').

[78] Bintliff 1977: 50. See also Rackham 1990, 1996; Zangger 1992a, 1992b; Moody & Rackham 1996: 9-10, 18-24; Osborne 1996a: 53-57.

[79] Shipley 1987: 272; Zangger 1992b: 17-19; Isager & Skydsgaard 1993: 14.

[80] Koster & Forbes 1976; Barker & Grant 1991: 24; Olson 1991: 419-420.

Pyrotechnologic industries often demanded timber charcoal fuel (due to the high temperature and length of the processing operation required), but even in the cases of known large metallurgical centres such as Rio Tinto, the evidence for purely destructive timber forestry, rather than managed coppicing, is not unequivocal.[81] Indeed, the fact that during the Classical period certain localities were considered the home of specialist timber resources for charcoal (e.g. Acharnai in Attika, Euboia) or trireme timber (Macedonian silver fir),[82] suggests resources were patchily distributed and eagerly sought after, and that appreciation of intra- and inter-regional diversity was a consequence of such geographical distribution, rather than the exhaustion of local supplies through irresponsible forest husbandry.[83] Such a situation would therefore be highly relevant to the conditions surrounding any mining operations on Siphnos in antiquity.[84]

What emerges from the on-going environmental debate is the complexity of *local* interacting human and climatic factors which have contributed to shaping regional mountainous landscapes in the Mediterranean.[85] On Siphnos, recent soil erosion on the *terra rossa*, terraced western slopes of Ayios Simeon has been measured as a colluvial wash of 3mm/year, and may be attributed to the abandonment of the terraces.[86] Unfortunately, environmental information gained from pollen core analysis is not available for Siphnos. However, topographical and archaeological evidence can be of some use in analysing alluviation and marine regression and transgression (of special interest given the story of the flooded mines in Pausanias X.11.2).

Alluviation

Alluvium has been deposited in the Kamares river valley (35 ha.) (*Pl.I.17-18*) and the small coastal plains of Plati Yialos (40 ha.) (*Pl. I.60*), Vathi (20 ha.) (*Pl.I.57*), Apokofto (2 ha.) (*Pl.I.62*) and Faros (4 ha.) (*Pl.I.64*).[87]

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[81] Blanco & Luzón 1969; Salkfield 1982.

[82] Theophrastos *HP* V.8 on the marked differences in regional timber; Theophrastos *HP* V.9.1-3 on lead-silver ore smelting as an activity which requires the best quality charcoal, specifying the use of pinewood charcoal, in addition to particular types of evergreen and deciduous oak, as fuels in silver extractive technology compared to the use of soft Euboian sweet chestnut charcoal in phases of iron smelting; Dem. XXI.167 for the accusation that Meidias abused his trierarchy by towing timber from Euboia to the silver mines of Laurion. Craddock 1995: 192-193 on fuel quality requirements for extractive processes.

[83] Rackham & Moody 1996: 128-129, 'There is no real need to fill Ancient Greece with vanished forests; nor is there real evidence anywhere in Greece of a reduction in woodland during the Classical-to-Roman period.' Osborne 1996a: 55 for geographical distribution of timber in Aegean.

[84] See below Ch.6. One toponym, Ξεροξύλο ('Dry wood'), is suggestive of a fuel source at a mine site on Mt. Profitis Elias (*Fig.2.4*), but it may simply refer to the maquis scrub.

[85] Rackham 1982; 1996: 20. Thus Zangger 1990: 146, 'Landscape evolution cannot be reconstructed with a search for over-simplified model-orientated processes in mind. Although similarities and interrelations between different areas do exist, most land-forming processes are extremely complex and sometimes even inversely related. Hence, environmental evolution must be viewed as an intricate, multi-dimensional system with many interdependent parameters — one of which is the history of human land use.'

[86] Riedl & Kalss 1983: 199.

[87] von Foullon & Golschmidt 1887: 27. Estimates from fieldwork and Birkett-Smith 1995.

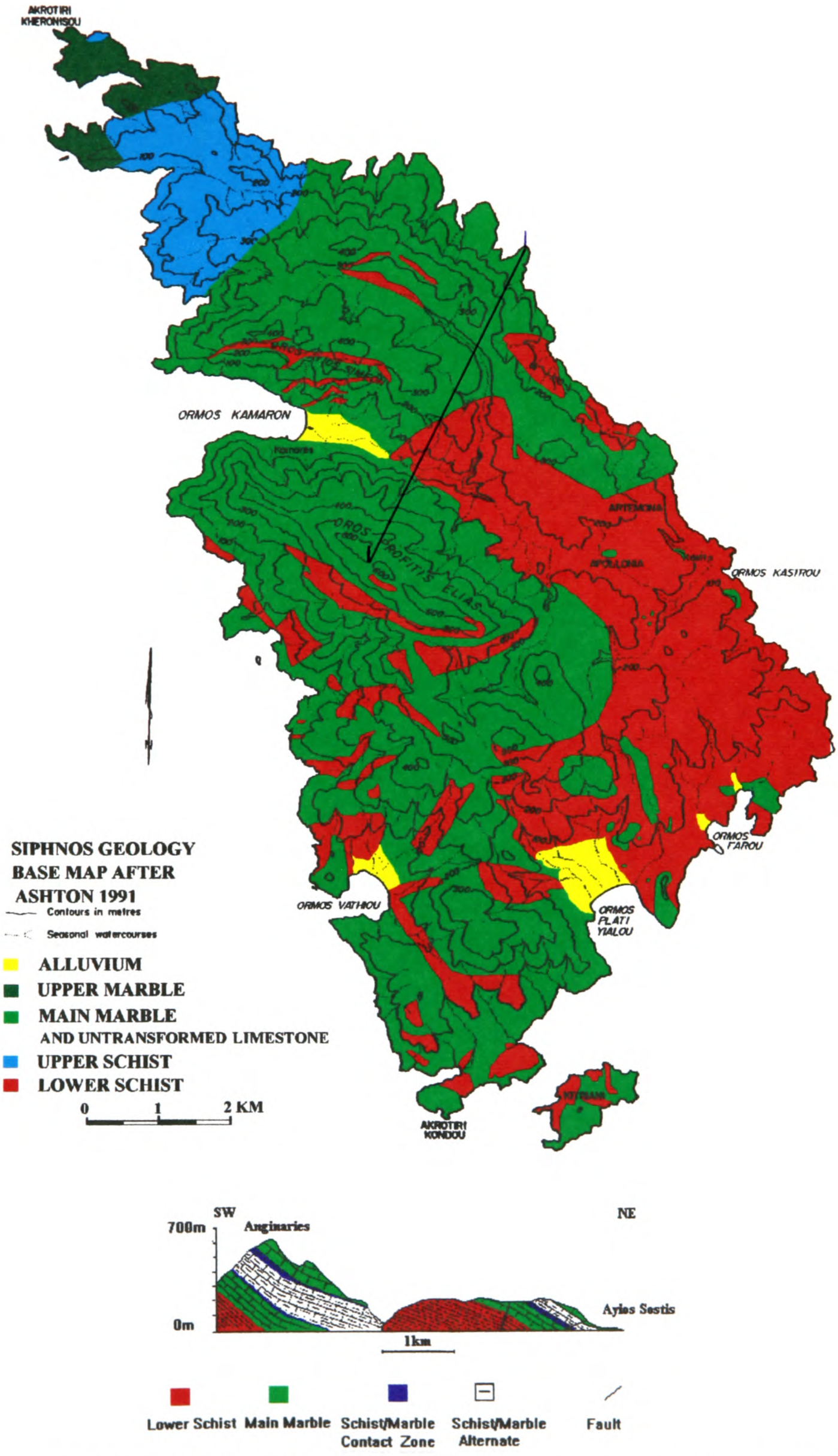

FIG.2.3: *Geological Map of Siphnos (after Riedl & Kern 1983, Wagner & Weisgerber 1985)*

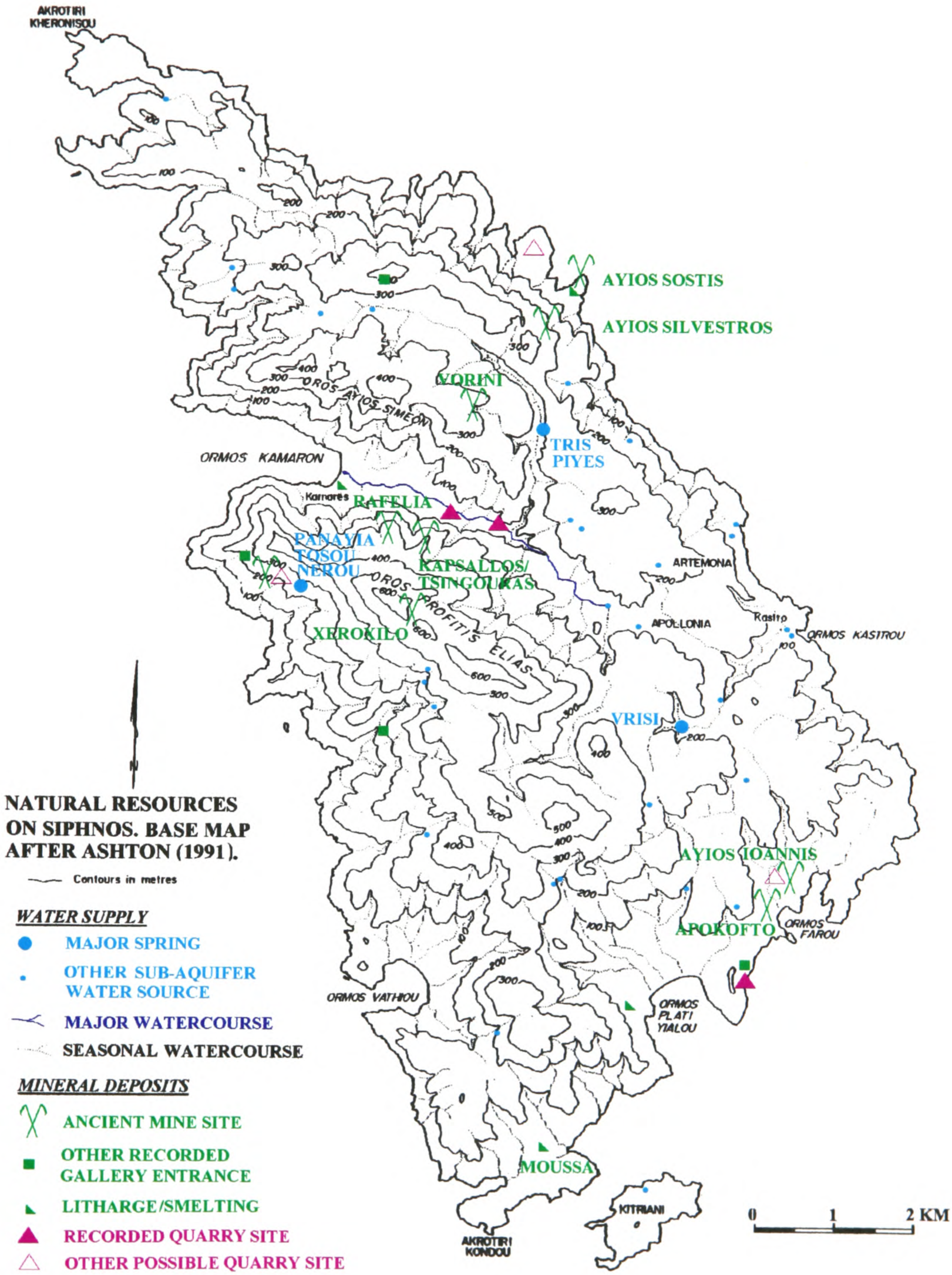

FIG. 2.4: *Distribution of natural resources (water sources, minerals) in the countryside of Siphnos.*

The respective dates of episodic alluvial deposition (including post-antique phases) have been discussed extensively by geomorphologists.[88] Any significant alluviation would have important consequences for our understanding of landscape change since antiquity, through the movement of hillside soil wash (colluvium), the soil enrichment of plains and valley floors at theexpense of hillsides, and possible geomorphological alteration of the shorelines.[89] Recent geomorphological studies have rejected broad explanatory models applicable to the Aegean as a whole and have stressed the regional and episodic nature of alluvial phases in historic times.[90]

Geological prospection at current sea-level in Kamares revealed an upper alluvial layer 10cm deep over a lower layer 10-40cm deep.[91] However, it is difficult to establish the chronology of alluviation, assess anthropogenic and climatological factors, or attempt reconstruction of the ancient coastline in alluvial areas of Siphnos. Nonetheless, it may be significant that archaeological sites built in the two largest alluvial plains of Kamares valley (**tower 15**) and Plati Yialos (**tower 49**), still remain at their original level and have not been submerged by any later deposits from nearby watercourses.[92]

Marine regression and transgression

Changes in sea-level occur due to a complex interaction of eustatic sea change (i.e. a uniform, general rise in sea-level over a certain period), tectonic movement and geomorphological factors.[93] The relative emphasis which should be placed on each factor has been debated since the first systematic surveys of Mediterranean coastlines in the 1960's and 1970's produced divergent opinions. The case for a eustatic level rise of the order of 1 m per millennium in the Aegean was put forward by Bintliff.[94]

This working hypothesis now appears too general and universal explanation for the maritime geography of the Aegean.[95] The complexity of geomorphological and tectonic processes at work on a micro-geological scale is only partially understood, and therefore it seems unwise, *a priori*, to posit a general law.[96] Flemming, on the other hand, argued that sea-level changes were irregular and localised,

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[88] Vita-Finzi 1969: 77-82, 91-102. *cf.* Runnels & van Andel 1987: 143-150; van Andel & Zangger 1990: 140-141; van Andel, Zangger, Demitrack 1990; Zangger 1992a, 1992b.

[89] Schaus & Spencer 1994: 421-424 suggest that alluvial silting at Eresos on Lesbos has been partly responsible for a change in shoreline between akropolis and anchorage of approximately 100m over two millennia. Niemi & Finke 1988: 133 note that the coastal zone of the Argive plain contains 'more than 2 m of post-Hellenistic alluvium.'

[90] van Andel & Zangger 1990: 152-153.

[91] Riedl & Kass 1983: 199.

[92] It is also worth noting that the watercourse which runs through the alluvial plain of Plati Yialos (*Pl.I.16*) is eroding the site around the ancient tower **49** as the bend progressively meanders (Ashton 1991: 136-137).

[93] Flemming, Czartoryska, Hunter 1973: 1; Davidson 1980: 156; Flemming 1996: 23; Rackham & Moody 1996: 195. Blue 1995: 217-259 for exhaustive discussion of factors affecting coastal change.

[94] Bintliff 1977: 10-29; Goudie 1992: 217-218.

[95] Stiros 1988: 1639 for the 'differential character of relative sea changes in the Aegean.'

[96] Goudie 1992: 230-233; Lambeck 1996: 589.

and that eustatic change was only in the order of 0.3 m.[97] Tectonic activity was therefore the most significant single factor in sea-level change, and it was a factor which operated on a local level.[98] While there is still debate over whether tectonic activity was responsible for the alteration of coastlines in one or several jolts since antiquity (a question especially vexed given the seismic nature of the Aegean area and its complex tectonics),[99] further research has indicated that any substantial changes in sea-level since antiquity appear to be the consequence of localised tectonic movements causing uplift (marine regression) or depression (marine transgression).[100]

On Siphnos, general depression of the north and east coasts and uplift of west coast appears to have occurred.[101] If a marine transgression did occur, the mines most likely to have been affected would have been those at Ayios Sostis on the east coast. There is however, no clear geological evidence of sunken mines off the current coastline. On the south coast, evidence for sea-level change since antiquity is inconclusive. At Faros, tower **43** is located on the current seashore, its foundations built upon a natural rock outcrop, with its lower courses currently submerged.[102] Although its current position may suggest a marine transgression since antiquity, the use of architectural evidence as markers of ancient sea-levels can be problematic: as Blackman notes, ashlar blocks may have been laid below sea-level in antiquity, thus 'arguments based on submerged walls are only valid if it can be convincingly demonstrated that these walls belonged originally to dry-land structures.'[103] In the case of tower **43**, it is possible that the structure had a maritime function, and therefore substantial marine transgression cannot be assumed automatically.

Mineral resources

Metals constituted Siphnos' most renowned natural resource in antiquity, although the scantiness of ancient literary references (Her. III. 57-58; Pausanias X.11.2) has been the cause of controversy

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[97] Flemming 1973: 58, 'An explanation purely in terms of a steadily changing sea level could not account for the variability observed.' Also Stiros 1988 favouring active tectonic processes as the cause of localised sea-level change in the Aegean; Rickman 1996: 4.

[98] Flemming 1973: 62, 'In a site less than 3,000 years old, any observed sea level change is more likely to be due to local earth movement than a world-wide eustatic change. If the relative change at a site is more than 30-50 cm, there is certainly a contributory factor of earth movement, but every archaeological site should be treated as a special case, and it is not possible to argue for an 'expected' relative sea level change on the basis of the age of a site, nor is it possible to derive dates of structures from their depth of submergence on the basis of an expected sea level time curve.'

[99] Pirazzoli 1988: 160-1.

[100] Bird 1984: 34-43; Blackman 1973b. Flemming, Czartoryska, Hunter 1973 for sites in Peloponnese and south-west Turkey. Jameson 1973 for Halieis in the southern Argolid. Scoufopoulos-Stavrolakes 1985 for tectonic activity at the port of Gythion. Empereur & Simossi 1989 for the submerged ancient harbour at Thasos. Murray 1988: 114-115 for the submergence of the harbour mole at Lefkas by approximately 3 m, although removal of blocks and rubble collapse of mole wall does make reconstruction and estimation of original courses approximate. Frost & Hadjidaki 1990: 513 for a post-antique tectonic uplift of approximately 6-9 m at Phalasarna in north-western Crete.

[101] Although there appears to be ongoing slippage of the north promontory of Kamares bay into the sea (*Pl.I.15*).

[102] Ashton 1991: 122-123.

[103] Blackman 1973b: 124.

surrounding the type, quantity and chronology of mineral exploitation, which has had to be established entirely by archaeological investigation.[104] Silver-rich lead ores, primarily cerussite ($PbCO_3$) lying in contact zones between schist and marble layers are found in two distinct areas of the island (*Figs.2.3-2.4*). One band runs from the north-east coast of Ayios Sostis (*Pl.I.3-5*) and Ayios Silvestros (*Pl.I.6-7*) across Vorini (*Pl.I.9*) in the centre of the island to Rafelia, Tsingouras, Kapsallos and Xeroxilo in the west (*Pl. I.10-11*).[105] The second zone occupies the area along the south-coast between Faros, Apokofto and Plati Yialos (*Pl.I.12, I.62*).[106] Trace analysis indicates that any gold deposits would have been limited to this area of the island.[107]

Siphnos also contains a number of other mineral resources in addition to lead and its associated contents.[108] Iron — from siderite ($FeCO_3$) or hematite (Fe_2O_3) — was available in quantity around the lead-silver contact areas (although apparently ignored by the miners), and elsewhere in the island.[109] Clay deposits, associated with the weathering of hard limestone formations and schists rich in iron oxides, creating *terra rossa*, are found throughout Siphnos (*Pl.I.13-14*).[110] The resource has architectural uses, either as unbaked mud-bricks for building or fired terracotta which may be used as roof-tile. The predominance of stone resources, however, tends to limit the first of these uses.

Clay is also the key raw material for ceramic production. The utilisation of the Siphnian resource by potters on the island in more recent times is well documented: coarseware pottery (primarily fire-resistant cooking vessels) was fired at coastal potteries and exported, or alternatively, travelling potters would travel with their own clay supply to certain Mediterranean destinations (such as Constantinople or Alexandria) on a seasonal basis, thus involving the Siphnian population in a very high level of

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[104] Michell 1958: 89. The most comprehensive study of the island's metal resources is to be found in Wagner, Genter, Gale 1980: 36-38; Wagner & Weisgerber 1985. Bent [1885] 1965: 26 reports on the mining operations of the French Mining Company from Laurion in the 19th century. On the relation between ancient rural sites and mining, see Ch.6 below.

[105] Hopper 1979: 169-170; Pernicka & Wagner 1985b. There are also substantial remains of mining activity to the north of Vlasi bay on the west coast (as recorded by von Foullon & Goldschmidt 1877: 27, Taf.II, and personal observation Dec. 1995), an area which was not investigated by the survey team for publication in Wagner & Weisgerber 1985. It seems unlikely that this site was part of the 19th-century network of mine workings re-exploited by the French Mining Company, due to the absence of mechanical transportation, such as cable railways, constructed at other mines in order to carry the ore for loading at Kamares.

[106] Pernicka & Wagner 1985a.

[107] Pernicka & Wagner 1985a; Shepherd 1993: 127. The debate concerning the existence of gold mines stretches back at least as far back as Ross 1840: 120; Graindor 1903: 466.

[108] Altherr, Schliestedt, Okrusch, Seidel, Kreuzer, Harre, Lenz, Wendt, Wagner 1979; Vavelidis, Bassiakos, Begemann, Patriarcheas, Pernicka, Schmitt-Strecker, Wagner 1985.

[109] The adit located above Vlikhada bay on west coast of the island (*Fig.2.4*) may have been worked for its iron content. Zinc and magnesium ores are also found in the quartz formations in the Kamares valley (von Foullon & Goldschmidt 1877: 25; Philippson 1901: 58, 1952: 78), but these are likely to have been of interest only in modern times.

[110] Philippson 1952: 78; Higgins & Higgins 1996: 6-9. Bintliff 1977: 92 on clay formations.

individual mobility.[111] Ancient patterns of Siphnian ceramic production are less well known. Recent studies suggest that the clay was not readily suitable for fineware ceramic production, and that the provenance of 'Siphnian style' pottery may in fact be Melian.[112] It seems therefore prudent not to exaggerate the potential economic role of a 'ceramic industry' on the island in antiquity, but rather to bear in mind how a local resource might very conveniently provide coarseware containers for the transport of other (agricultural) products.

Siphnos was also known for at least one stone commodity in antiquity, which bears similarity to the clay for its fire-resistant qualities in cooking utensils.[113] The geological identity of this 'Siphnian stone' (as hard as iron and also used for furniture) is uncertain, as is its location (mined three stades, approximately 600m, from the sea, according to Theophrastos), although Dworakowska appears correct to follow Philippson in identifying the product as talcum schist on the basis of the island's geological formation, which would also approximate to the location of quarries in the Kamares valley.[114] The quarrying itself may not necessarily have been on a large scale - the stone might be obtained by digging out protruding lumps from the soil.[115] The economic importance of such a resource would therefore be in its peculiarity rather than in its quantity — a commodity with some degree of novelty value ascribed to the locality of its raw material.

The limestone, marble and schist geology provided ample resource for basic construction material which could be quarried from local rock formations, as well as for the marble exterior walls of the Archaic treasury at Delphi.[116] Petrological analyses of quarries in the Kamares valley and the east of Plati Yialos bay have attempted to date activities there, but the problems are similar to those encountered in the archaeology of mines subject to modern working.[117] Schist and marble appear to

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[111] See *Map 1* for distribution of modern potteries. The most comprehensive account is Wagner 1974. Also Casson 1938: 470 on Plati Yialos potteries; Blitzer 1990: 678 n.8 for Siphnian τσουκάλια. Contemporary accounts of potters in Ross 1840: 139; Fiedler 1841: 135; Bent [1885] 1965: 22-23, Pollak 1896: 210; Philippson 1901: 59; Fermor 1966: 185.

[112] See above n.36.

[113] Theophrastus *de lapidibus* VII.42; Pliny *NH* XXXVI.159; Steph.Byz. *Ethnika* 573.3.

[114] Dworakowska 1975: 11 n.2 following Philippson 1959: 59 (Dworakowska 1975: 48-49 for Pliny's earlier Greek sources). For the problem of identifying particular quarries, Dworakowska 1975: 58, 'But since the Greek and Roman terms for the various kinds of stone nearly always derived from the place where the stone was quarried, we are then in possession of indirect evidence about the quarry, or, more often, about the region where the quarry was situated...But there are only rare cases where this information is sufficiently precise to enable us to point with complete certitude to a particular quarry.'

[115] Dworakowska 1975: 11. Approximately 200 m north of the mine site at Ayios Ioannis lies a field (100m x 50m) which appears to have been quarried.

[116] Philippson 1959: 78; Daux 1970: 67; Daux & Hansen 1987: 73-154. The 'white or pinkish grainy marble' was used in combination with Naxian, Parian and local Parnassian marble on the Siphnian Treasury (Daux & Hansen 1987: 26-32; Lodwick 1996: 18). Sheedy 1988: 365 suggests that local quarries of high grade white marble were not available for sculpture or architecture (*viz.* Parian marble in prytaneion and agora, Her..III.57-58), but for the purposes of building construction local worked grey marble appears to have sufficed (see *Figs.2.3-4*).

[117] Renfrew & Springer-Peacey 1968: 66. The dating quarry workings as 'ancient' on the basis of stone working techniques, claims of weathering, or the lack of explosives marks can result in circular argumentation (Dworakowska 1975: 19-35).

have been worked in the Kamares valley and marble east of Plati Yialos, and it has been suggested that another ready location for marble blocks was found on north-east coast in the area around *Aspri Vrakha*.[118]

Hydrology

The relation of geology to natural water supply is an important factor in consideration of settlements and agriculture which are otherwise dependent upon wells dug down to the level of the water table, rainfall stored in cisterns, or surface water collected in natural depressions above impermeable schists, such as at the site of Ambourdhekti ('rain-receiver') in the north of the island.[119] However, although geology is assumed to be part of the *long durée*, recent changes to the hydrological landscape may have occurred through the needs of modern water supply and storage (such as the effects of irrigation techniques, domestic and tourist accommodation): our modern conceptions of what constitutes an adequate supply may prejudice evaluation of ancient water sources and their suitability to support domestic or agricultural demands.[120]

Several scholars have concluded that the predominant limestone formations of the Greek landscape precluded permanent dispersed rural settlement, and forced settlement around natural springs.[121] Thus, for reasons of geology, 'solitary life at isolated farms was exceptional'.[122] This influential generalising theory, which tends to draw upon geographical determinism in its approach to patterns of human settlement, has meant that the study of rural water supply is often neglected in favour of urban studies,[123] and important questions (such as the type and extent of irrigation technology) are overlooked.[124]

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[118] Daux & Hansen 1987.

[119] **Tower 5** (Ashton 1991: 46-47). See *Pl.5.3*. Vielweib 1983: 133, Blitzer (forthcoming) note that impermeable schists slopes between Kheronisos and Troulaki in the north provide a relatively good perennial water supply, which once allowed a water-mill to function.

[120] Brun 1993: 224 n.4.

[121] Semple 1932: 539; Kirsten 1956: 91. According to Bolkestein 1958: 21, 'Greece is a country poor in water; it hardly has any rivers which are not dried up in the hot season; there is no rainfall in summer, so wells are not sufficient for the whole year. A result is that every settlement is absolutely dependent on the presence of a spring. Many and small villages can only subsist in regions where numerous springs are found. Wherever they are scarce — and this is the case in all the countries round the Mediterranean Sea — isolated farms and villages are impossible and the population must dwell together in larger cities, often far away from the land which they must cultivate daily.' The theories are well summarised in Pečírka 1973.

[122] Bolkestein 1958: 21.

[123] *viz*. Knapp 1919: 73; Richter 1968: 105-106; Glaser 1983: 125-164, 165-175.

[124] e.g. Crouch 1993, the most recent treatment of water management in Greek cities, is urbano-centric in focus, and with the exception of one paragraph (Crouch 1993: 29), ignores the whole topic of agriculture and irrigation. The infrastructure of ancient irrigation (whether periodic watering or the construction of permanent siphon channels) is debated (Osborne 1987: 72-73; Étienne 1990: 27; Forbes in Wells 1992: 102), but the description in *Iliad* XXI.257-259 indicates permanent irrigation for arboriculture and 'garden' cultivation (Guiraud 1893: 188-191, 469-471; Semple 1928: 138-140, 1932: 440-1; Burford 1993: 135-137). While the role of irrigation in other aspects of ancient Greek agriculture is minimised by Gallant 1991: 56-57, Burford 1993: 247 n.16 and Hanson 1995: 60-64 argue that irrigation was not limited to watering of the garden (κῆπος), usually seen as a separate, demarcated area of cultivation although our knowledge is extremely limited (Kent 1948: 318 n.240; Pritchett 1956: 264; Vatin 1974: 345-357; Bruneau 1979: 89-99; Brunet 1988a:

Such an assumption of rural hydrological poverty also obscures considerable regional variations both in rainfall and geological structure. Indeed knowledge of hydrology in antiquity indicated that certain soils, especially impermeable clay, retained water and provided springs.[125] However, although ancient written sources are limited on this matter,[126] the sophistication in the choice of rural springs suggested by the ethnography of local water supply in modern Greece at least provides an alternative to geologically determinist theories of human settlement.[127]

Springs

Springs, formed when rainwater descends through an aquifer (permeable rocks such as limestone formations) until a barrier (the upper surface of an impermeable layer, such as schist, or a fault) is reached, forcing water to the surface along the line of permeable and impermeable rock, are found in several places on the island, due to the complex limestone and schist formations (*Fig. 2.4*).[128] The most notable perennials, which are large enough to be used for irrigation as well as domestic supply, are found at Tris Piyes ('Three Springs'), the monastery of Panayia Tosou Nerou ('Holy Virgin of So Much Water'), and the main spring Vrisi in the south of the, the site of a large monastery.[129] There are also a number of springs on the east coast of the island, at Kastro,[130] Dialiskari and Panayia Poulati, where gullies provide irrigation for intensive arboriculture.[131]

277-9; Osborne 1992c: 374; Burford 1993: 136). The fullest ancient account is in Dem. LV - a dispute over damage caused by rain water run-off in a hilly farm area (ὁρους δὲ περιέχοντος κύκλῳ τοῖς χωρίοις - Dem LV.10); recent discussions in Osborne 1985a: 17-18; Isager & Skydsgaard 1992: 147-8; Burford 1993: 65; Foxhall 1996: 47-8 (with regard to the practice of terracing in antiquity). The argument focused on whether the flooding area, around which a wall had been constructed, was part of the defendant's private land (χωρίον) or was an agreed seasonal watercourse (χαράδρα), and by implication, public land (Dem LV.12-13). The defendant argues that since the water does not come from another property, nor does anyone else take it on from him (ταύτῃ δ' οὔτε παραδίδωσιν οὐδεὶς οὔτε παρ' ἐμοῦ παραλαμβάνει), it cannot be classed as a seasonal watercourse (19-20). He appeals to the jury (19) on the (perhaps idealised) basis that neighbouring land owners would form a 'chain' of water-flow where there are commonly acknowledged seasonal watercourses. Agreement between neighbours in the channelling of rain water is also apparent in a Gortyn law *IC* IV.43B, 73A (*cf.* Isager & Skydsgaard 1992: 148).

[125] Plato *Critias* 111, D; Aristotle *Meterology* I.13 on springs in mountainous areas.

[126] Argoud 1987: 28. Plutarch *Solon* 23 for arrangements in Attika concerning the twice daily drawing of a fixed amount of water from a neighbour's well if water had not been struck by 60 feet down. Dem.55 for the storage of hill water run-off.

[127] Miller 1905: 298-299; Glover 1945: 1-29 for differentiation between rural water sources on grounds of potability and taste rather than purely 'functional' considerations.

[128] On spring formations, Crouch 1993: 74-78; Higgins & Higgins 1996: 10-11; Rackham & Moody 1996: 42.

[129] Vielweib 1983: 124-125 for Tris Piyes and springs in northern Siphnos. Bent [1885] 1965: 34 on Vrisi, 'This monastery is built in a fertile gorge, and, as its name implies, amidst running waters and bubbling streams. This source supplies all Siphnos with water. And the luxuriance of orange and lemon trees, the festoons of maidenhair and other ferns, are quite fairylike as you ride along.'

[130] Buchon 1911: 190, though apparently not large enough to supply a population of several hundred at Kastro. See n.66.

[131] Vielweib 1983: 133-134 for fruit and vegetable irrigation on modern Siphnos.

Drainage

The watersheds of Profitis Elias and Ayios Simeon dictate drainage in the centre-west of the island, with gullies carrying run-off water down from Profitis Elias to the Kamares valley, where the river is fed by stream-beds which south-west from the Troulaki valley. The bed of the river valley is never completely dry in high summer (even with the effect of a modern underground collection tank at Kamares which draws off water). Along the west coast a series of steep watercourses cut through the marble and schist formation. Some are seasonal run-offs carrying rainfall torrents, but the watercourses which run down to Vlasi, Tsokha, Vlikhada and Khokhlakoi bay appear at junctures of schist and marble, and the fact that water can be seen to flow in the summer months suggests subterranean sources.

South of the Profitis Elias ridge there are numerous steep gullies running down into the Skafi valley, where it is joined by run-off from the west side of Ayios Andreas. The lower schist pocket in this area retains precipitation run-off along the valley bottom. The dry bed of Kakos Potamos indicates a seasonal watercourse, and indeed most watercourses which run down from the foothills to the south coast appear to be storm torrents. On the east coast a seasonal watercourse runs down the valley south-east of Artemona (the route of the modern road), while another spring-fed watercourse follows the Erkies valley north-east from Vrisi.

Soils

Figs.2.5-6 give an indication of the broad geological division between the eastern schist areas and western marble/limestone areas reflected in types of modern land use.[132] This is not to infer that the same areas were held under cultivation or identical crops grown there in antiquity, but to illustrate that the flatter, schist areas in the east of the island provide more easily cultivable land for cereals.[133] The land in the west of the island is affected by a combination of crystalline limestone bedrock, thin soil, and steep slopes. However, small pockets of rich agricultural land on schist bedrock do exist in this region. In addition, the slopes of the limestone bedrock could be productively managed for cereals and arboriculture given sufficient input of labour to transform the natural steep slope gradients.[134] There are extensive traces of abandoned terraces along the lower slopes of the west coast.[135]

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[132] Much arable land throughout the island currently lies abandoned since cereal cultivation has largely been abandoned.

[133] Vielweib 1983: 124.

[134] See Ch.6 for detailed discussion of this point. Isager & Skydsgaard 1993: 14 note that, 'the physical frames of agriculture are immediately comparable to what we witness today,' but that comparison 'must not be over-emphasized because it is scarcely true in its details, but only in its main features.'

[135] Vielweib 1983: 127-129. Personal observation, Oct-Nov 1995.

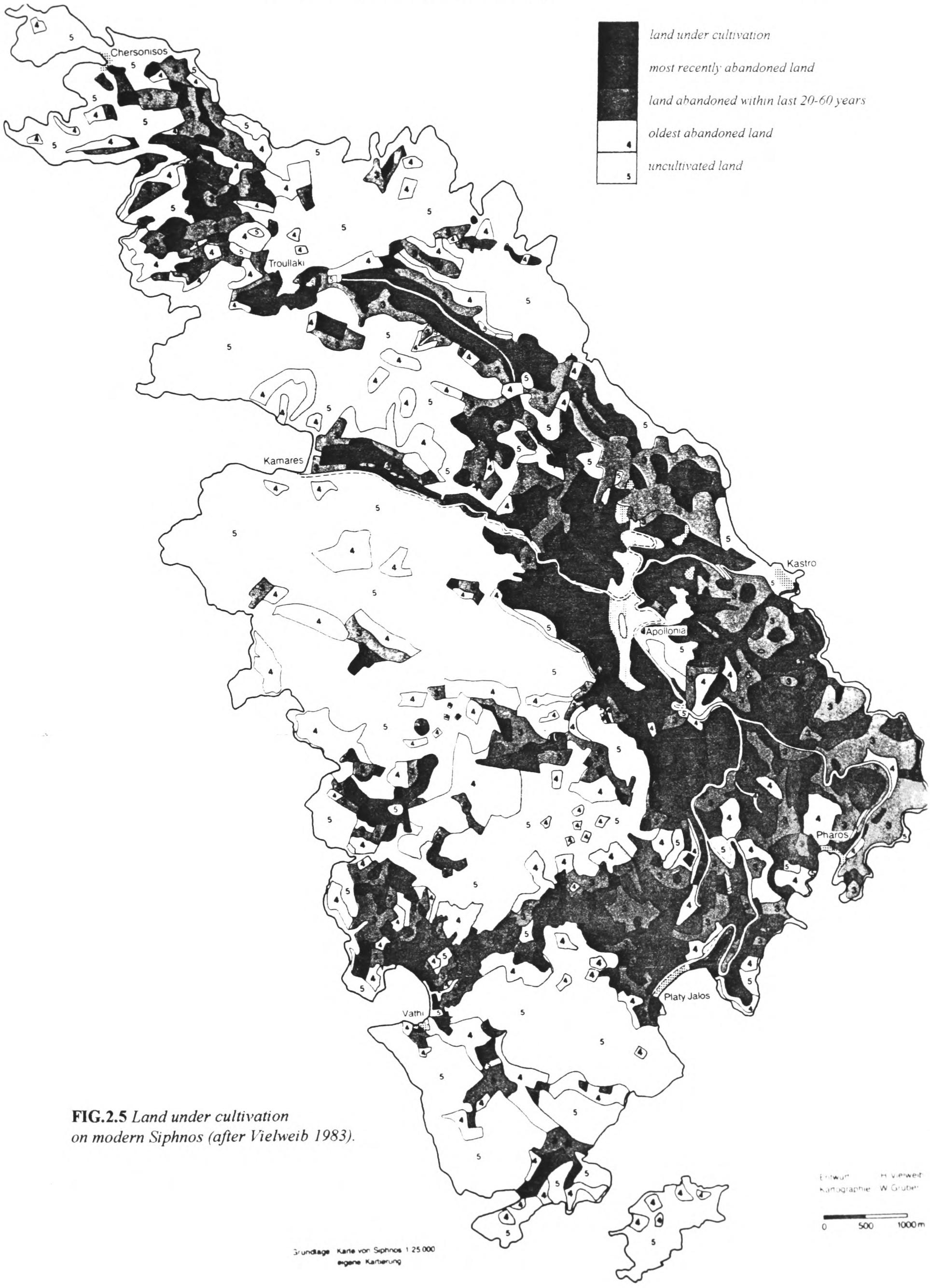

FIG.2.5 *Land under cultivation on modern Siphnos (after Vielweib 1983).*

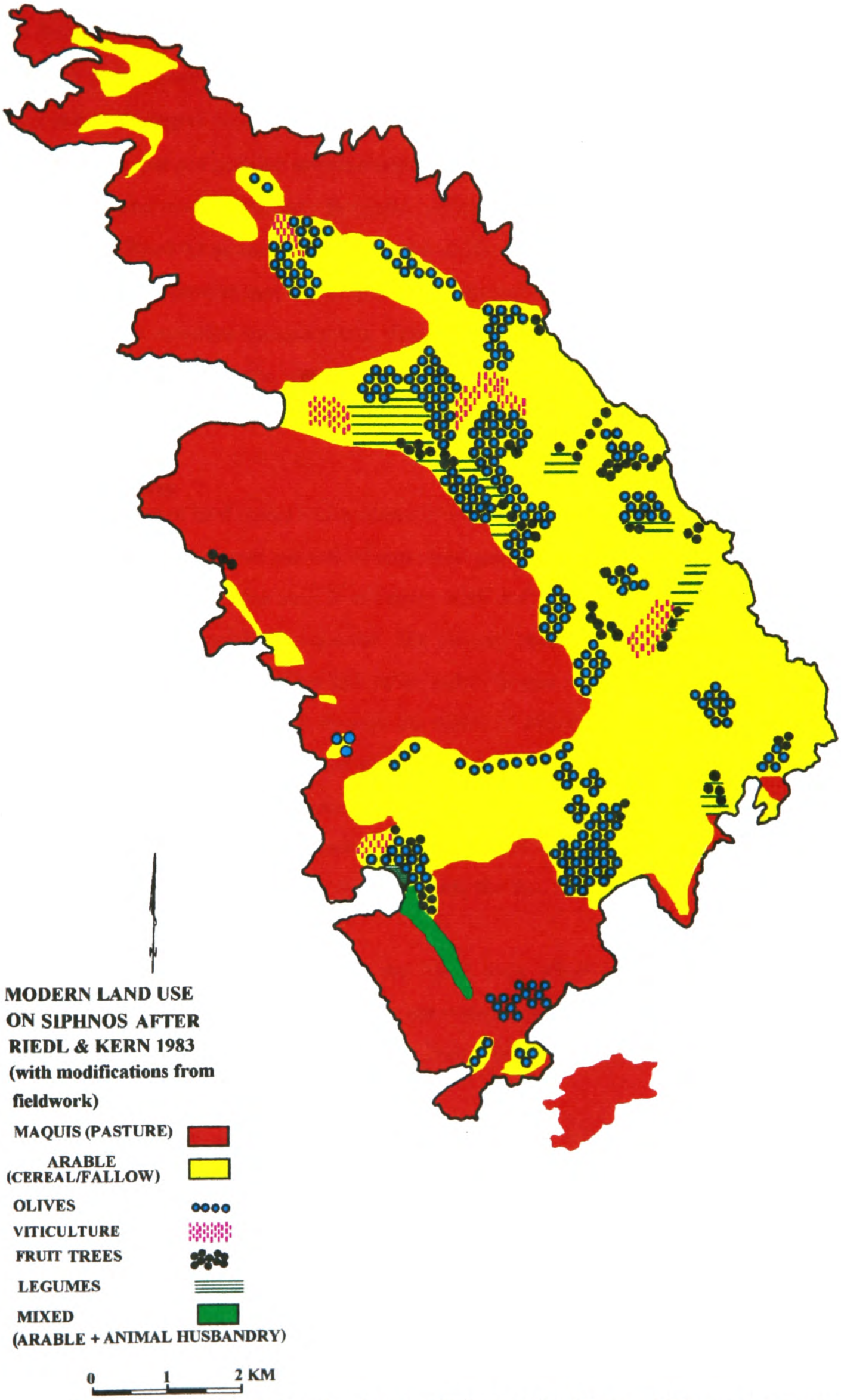

FIG. 2.6: *Type of modern land use on Siphnos (after Wagner 1974 and fieldwork).*

COMMUNICATIONS

One further aspect of the physical environment which deserves attention in relation to the context of rural sites is the presence of communications — whether on land (e.g. roads and paths) or sea (e.g. harbours and anchorages) — as a type of resource.[136] Like geological features, they are not simply a 'natural' resource, but are mutable within a human environment: thus currently paved *monopatia* may reflect medieval and modern property divisions, settlement patterns and networks of communication, and it is often difficult to appreciate the antiquity of the routes they overlay. Likewise, the maritime accessibility of the respective east, south and west coasts of the island can also indicate the extent of participation in the maritime economy (e.g. fishing), possible sea-routes for trade, and wider inter-regional communication networks, even though the archaeology of ancient anchorages and harbours is often limited by lack of primary evidence.

Land communications

Although the state of land routes was a matter of comment for more recent visitors to the island,[137] it seems highly likely that a formal network of stone built paths would have been required in antiquity, at least around the vicinity of mine sites in the east, south and west of the island where a considerable volume of animal traffic would be expected. The primary means of communication to and from the north of the island is through the Troulaki valley (near the east coast mine sites), while the Kamares valley offers the main east-west axis through the centre of the island. From the Kamares valley, the west of the island can be reached via the steep eastern slopes of Mt. Profitis Elias, passing the mine sites of Kapsallos and Xeroxilo, and crossing a saddle at Laouteri to the north. The west coast of the island is most accessible via the Skafi valley which intersects the ridge of Profitis Elias or via the less steep southerly slopes of the mountain ridge (towards the bay of Vathi) on its descent towards Plati Yialos.

Communication with the south-west of the island must effectively circumvent the tableland of Katsistria and Lagou, either to the south along the coastline opposite the islet of Kitriani (requiring a steep ascent around the precipitous west side of Plati Yialos bay), or south from Vathi, through the valleys of Katsamba and Kakos Potamos.[138]

In the east and south-east of the island, the more gentle terrain offers a myriad of potential interconnecting routes between Kastro and the bays of Faros and Plati Yialos on the south coast,

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[136] See above p.47.

[137] Buchon 1911: 189, 'De tous les chemins que j'ai parcouru jusqu'ici dans la Grèce et dans ses îles, les plus horribles sont certainement les chemins de Siphnos.'

[138] Young 1956b: 55 claimed to have identified an ancient road in the south-west of the island near tower **55**, although no corroboration was provided in his report. If correctly identified in fieldwork, it runs in westward towards the bay of Fikiada.

although the route along the Erkies valley south-west from Kastro, and from Vrisi south-east to Faros are notable in linking Kastro to the south coast of the island.

Maritime communications

The 'high and steep' coastline of Siphnos contains a great variety of potential anchorages — from narrow inlets on steep rocky coasts to gently shelving, wide sandy bays — which broadly look out on three aspects: north-west towards Seriphos, Kythnos, Keos, Attika and the Argolid, south-west towards the Melos group of islands, and south-east towards Pholegandros and Sikinos (*Figs.2.2, 2.7*).[139] The sea-bed off the east coast of Siphnos (part of the sunken plateau which forms the geological base of the inner Cyclades) is relatively shallow (*Fig.2.7*). Immediately to the west of the island, the water depth reaches over 370 m, and rapidly shelves away to over 500 m in a short distance.[140] In consequence, there tends to be more sea swell on the deeper west coast. Around the tip of Akrotiri Kondou in the south-west there is a risk of lee eddies.[141] There is minimal tidal effect.

However, maritime communications are also dependent upon prevailing sea and wind conditions, which need to be considered: seasonal winds, sea currents and swells can affect the amount of shelter afforded by a bay at different times of the year, according to aspect and relative exposure to the open sea (the fetch).[142] Aegean winds appear to have blown from essentially the same directions and at the same times of year in antiquity as those of the present day.[143] On Siphnos, the prevailing wind is northerly with some westerly winds, although there are seasonal variations, together with local factors of relief which affect winds (*Fig.2.7*).[144] This is most noticeable in the west of the island, where convection currents of air heated by the land mass rise steeply from the slopes, creating a strong mid-afternoon sea breeze (during otherwise relatively calm conditions) from spring to early autumn.[145]

In spring there are light winds (1-5 km/hr) from all directions except south, with north the most prevalent. There is some chance of strong winds (8-14 km/hr) from the west and north.[146] In summer

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[139] Admiralty Hydrographic Office 1945: 468; Philippson 1952: 76. Ormerod 1924b: 18-19, 28-30, 144-5; Blue 1995: 149 for the use of informal anchorages and coastal navigation. N.B. Blackman 1988: 8, 'I am impressed by the number of *small* harbours in the ancient world', criticising Lehmann-Hartleben's assumption (Lehmann-Hartleben 1923) that harbour size and sophistication 'developed' during antiquity (*cf.* Blackman 1988: 7).

[140] Philippson 1952: 14.

[141] Watts 1975: 598-9.

[142] Blue 1995: 266-267, 'Fetch is the distance of open sea to windward of a place and influences the effect of the wind on the sea...in general the greater the fetch, the greater the swell it induces and the longer that swell persists.' *cf.* Dear & Kemp 1987: 58.

[143] Meiggs 1982: 40; Murray 1987.

[144] Leake 1856: 160 commented, 'The north wind is so prevalent in this island, that most of the windmills have their vanes fixed to that point of the compass.'

[145] Since the land is warmer than the sea during daytime, creating an 'on-shore' breeze, there is no opportunity for precipitation to build up from convection currents (Furlan 1977: 191).

[146] Watts 1975: 534-5 for conditions in the western Cyclades.

months northerly winds are prevalent (typically 1-5 km/hr): the *etesian* winds can blow strongly in high summer. With the onset of autumn and more unsettled meteorological conditions, northerlies are still prevalent but gusting may occur from most directions of the compass. In winter months, westerlies grow stronger. The traditional sailing season between spring and autumn (May-September) would therefore occur with a predominant north wind, although local diurnal land and sea breezes could be used advantageously, especially for short journeys between islands.[147] Short-distance sailing was also possible outside the notional 'sailing season', even if longer journeys were more hazardous.[148]

Bays with westerly aspect

Given these conditions, the bay of Kheronisos in the north of the island offers the first landfall for vessels approaching from the Saronic gulf or the western Cyclades, with the sand-bottomed, dog-leg inlet (90 m at its deepest point) providing shelter even for larger vessels from northerlies (*Fig.2.8, Pl.I.47-49*).[149] It is also an accessible anchorage in the winter, although exposed to westerly winds. Approximate walking time from Kheronisos to Kastro is 4 hrs.

To the south of Kheronisos lie the bays of Vroulidia bay (*Pl.I.51*), Artemoni (until recently the location for a pottery) and Yialoudia (*Pl.I.52*). The steep slopes of the surrounding coastline provide shelter from northerly winds but the anchorages are exposed to the west.[150] Access on foot to and from these bays is steep and difficult.

The southern side of Kamares (the largest bay on Siphnos) turns sharply to the south-west, exposing the bay to strong, swirling gusts with accompanying swells from the west, although the steep slopes provide shelter against northerlies (*Fig.2.8, Pl.I.53-54*).[151] Visibility is limited on approach at sea-level.[152] Ships moor behind the man-made harbour mole on the south-east of the bay, but the gently sloping beach also affords the potential for beaching.

At Vlasi, south of Kamares, a landing place with rock-cut steps provides access to an area of the island otherwise extremely difficult to reach by foot (*Pl.I.66*). The bay itself is open, with little shelter from the west, although its north side provides some shelter from northerly winds.

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[147] Rougé 1981: 15-20; Blue 1995: 91.

[148] Pryor 1988: 87-91; Blue 1995: 263.

[149] Philippson 1952: 76. Heikell 1994: 247, 'It provides good shelter from the *meltemi* and indeed from all but W winds'. Admiralty Hydrographic Office 1945: 468 notes its use as a port of call for island steamers.

[150] Admiralty Hydrographic Office 1945: 468; *viz.* the largely negative comments of the *Greek Waters Pilot* (Heikell 1994: 247) on Vroulidia, 'a bleak and desolate spot affording little shelter, certainly not as good as that offered by nearby anchorages.'

[151] Admiralty Hydrographic Office 1945: 468; Heikell 1994: 248.

[152] Heikell 1994: 248, 'It is difficult to see where the entrance is to the bay—vessels appear to pop out of a slit in the cliffs.' A modern shipping beacon is located on the south side of the bay, approximately 500m west from the settlement of Kamares. Another beacon is located on the western tip of Kavos Kokkalas promontory on the north side of the bay, in the vicinity of a reported ancient tower (Young 1956b: 52; Ashton 1991: 60-61).

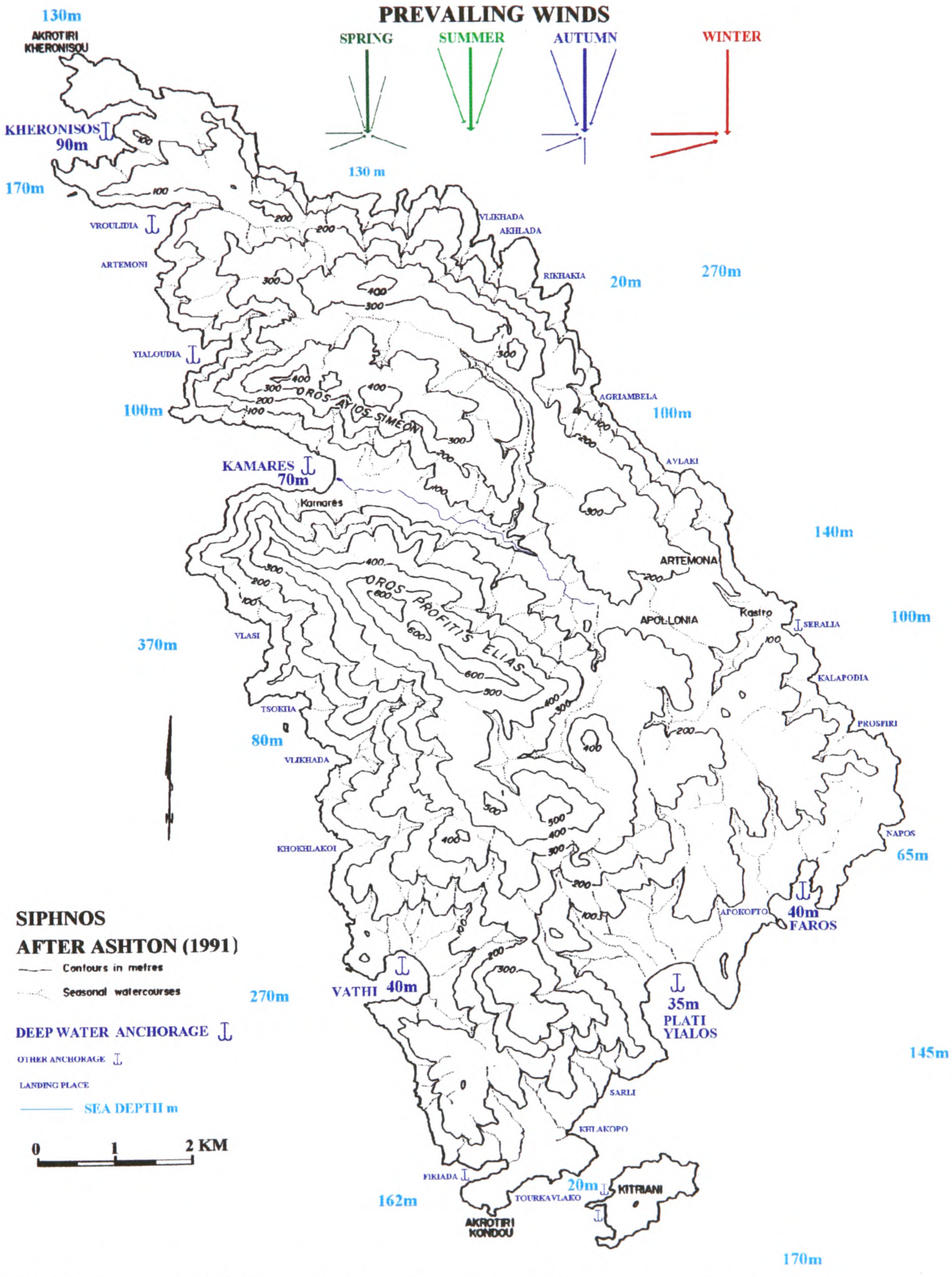
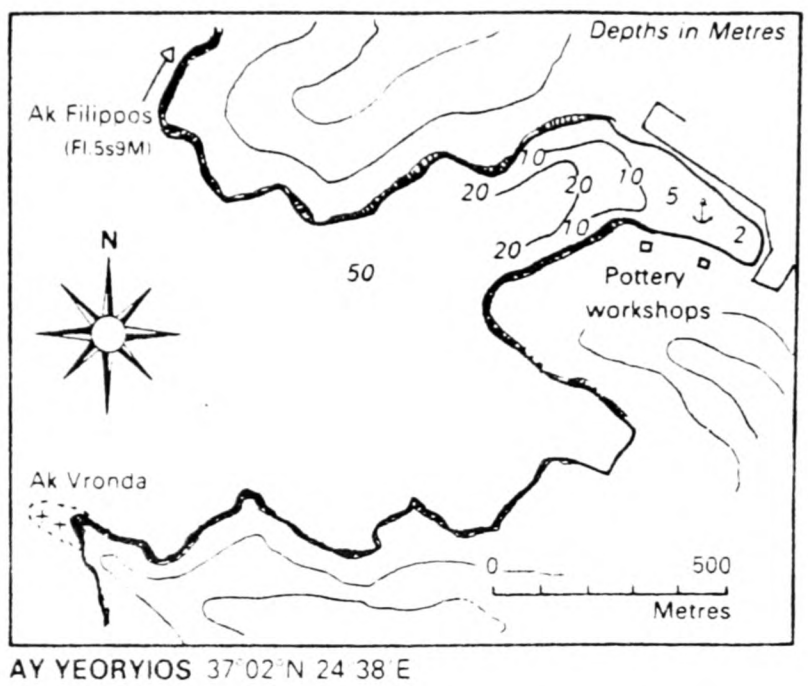
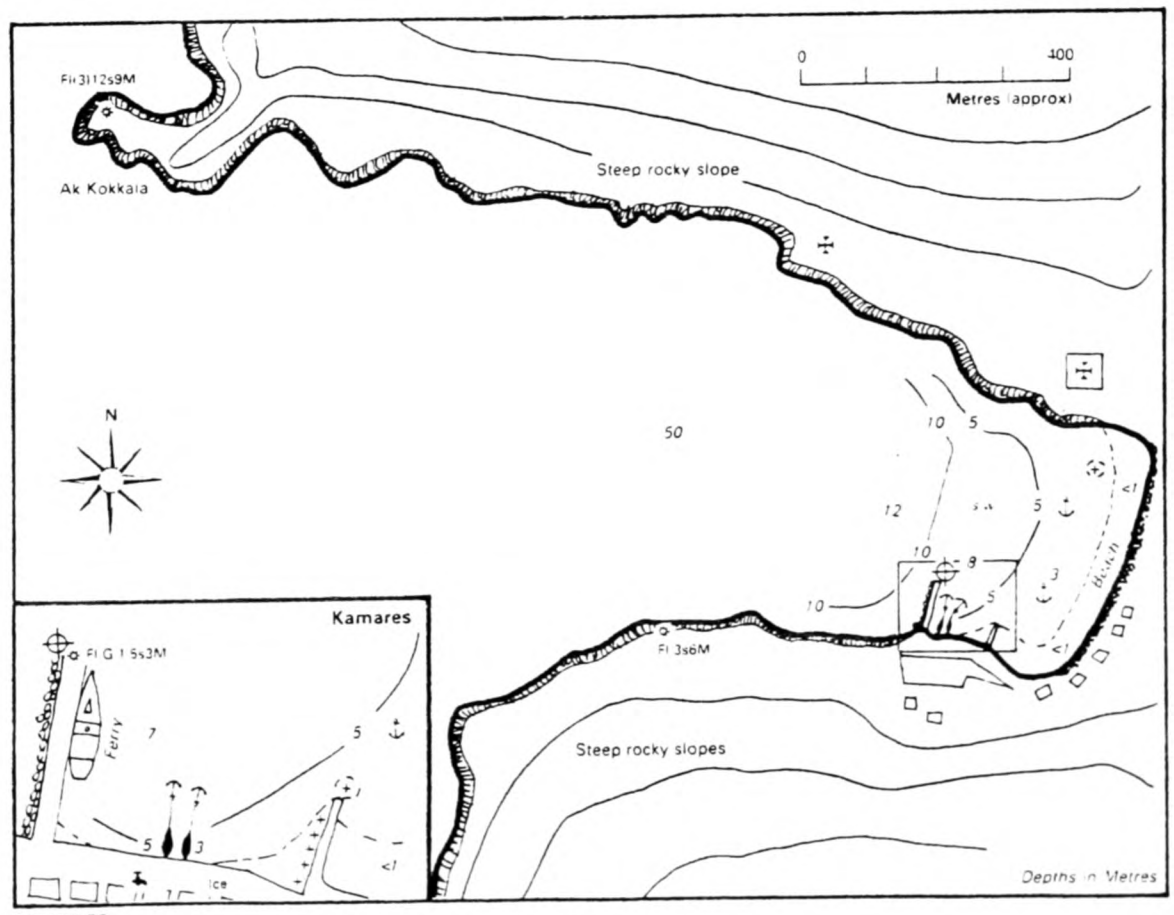


FIG. 2.7: *External communications, marking harbours and landing places with seasons, prevailing winds.*



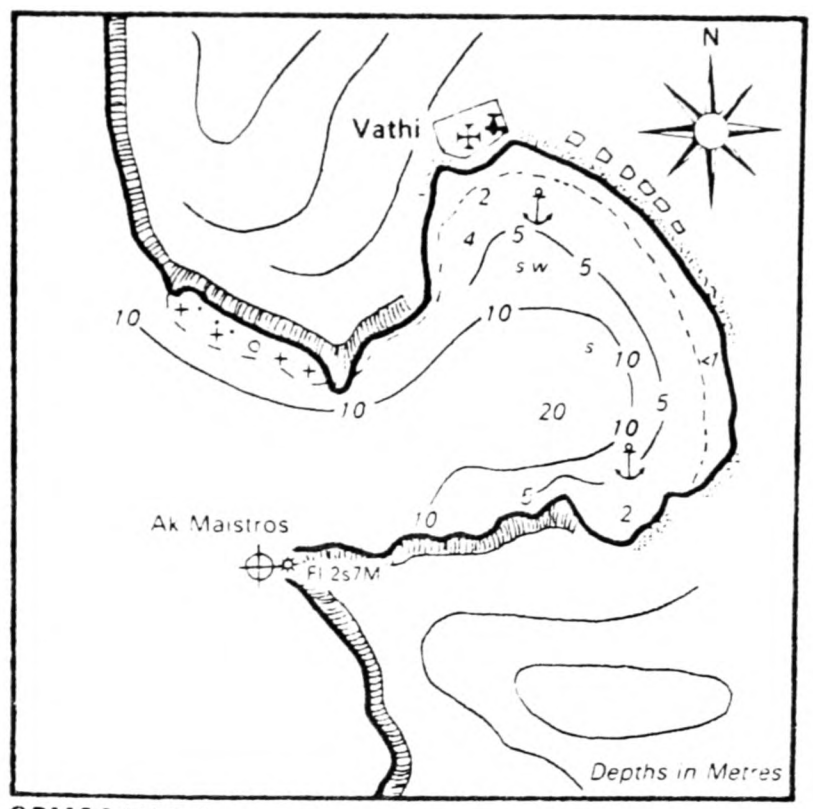
AY YEORYIOS 37°02'N 24°38'E

FIG. 2.8a: *Kheronisos Bay after Heikell 1994: 247.*



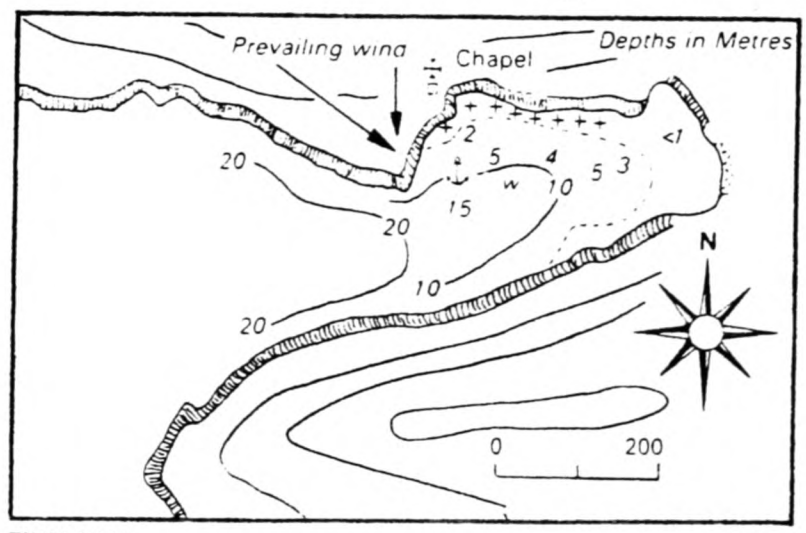
KAMARES
36°59'.5N 24°40'.5E (Fl.G.3M)

FIG. 2.8b: *Kamares Bay after Heikell 1994: 248.*



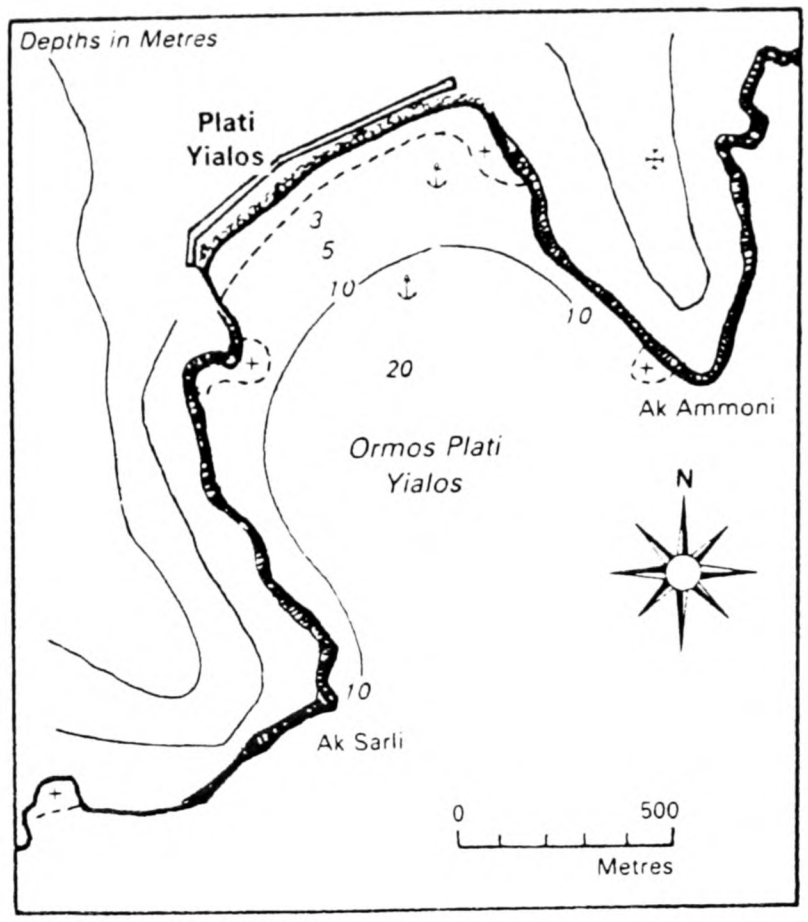
ORMOS VATHI
36 55 ·5N 24 41 ·1E (Fl.2s7M)

FIG. 2.9a: *Vathi Bay after Heikell 1994: 249.*



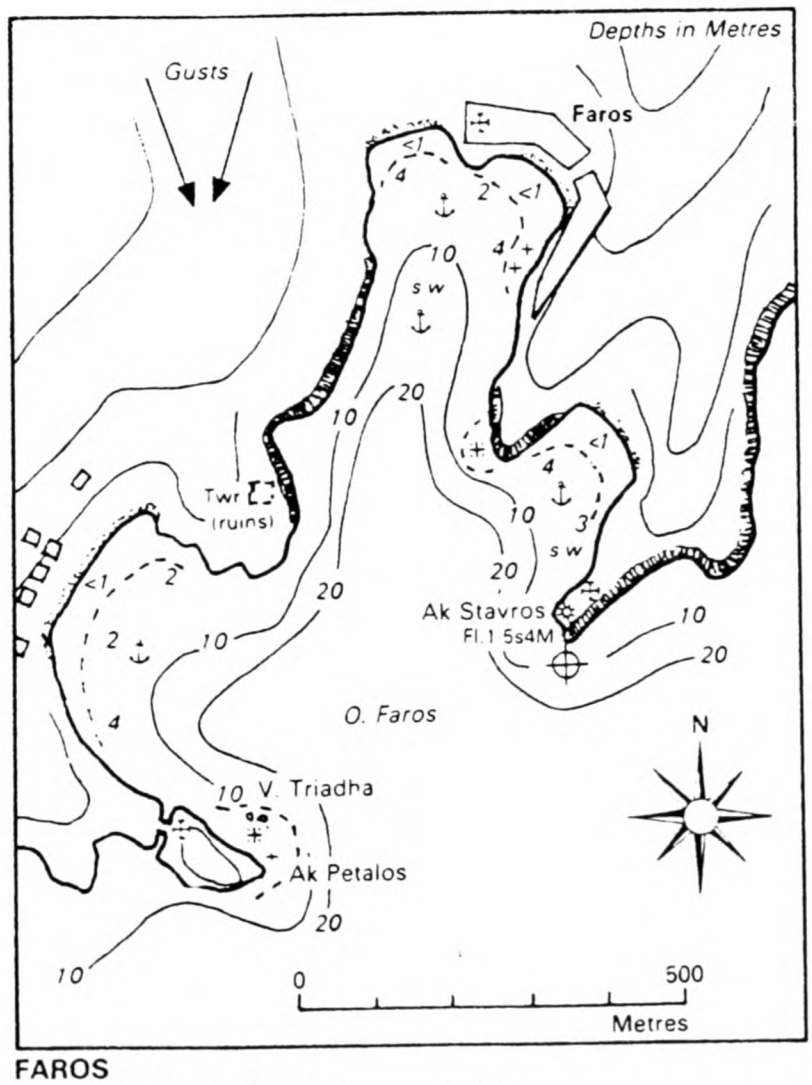
FIKIADHA
36 54' ·3N 24 42' ·3E

FIG. 2.9b: *Fikiada Bay after Heikell 1994: 249.*



ORMOS PLATI YIALOS
36 55 5N 24 44 E

FIG. 2.10a: *Plati Yialos Bay after Heikell 1994: 249.*



FAROS
36°56' 3N 24°45' 4E (Ak Stavros light)

FIG. 2.10b: *Apokofto and Faros Bays after Heikell 1994: 250.*

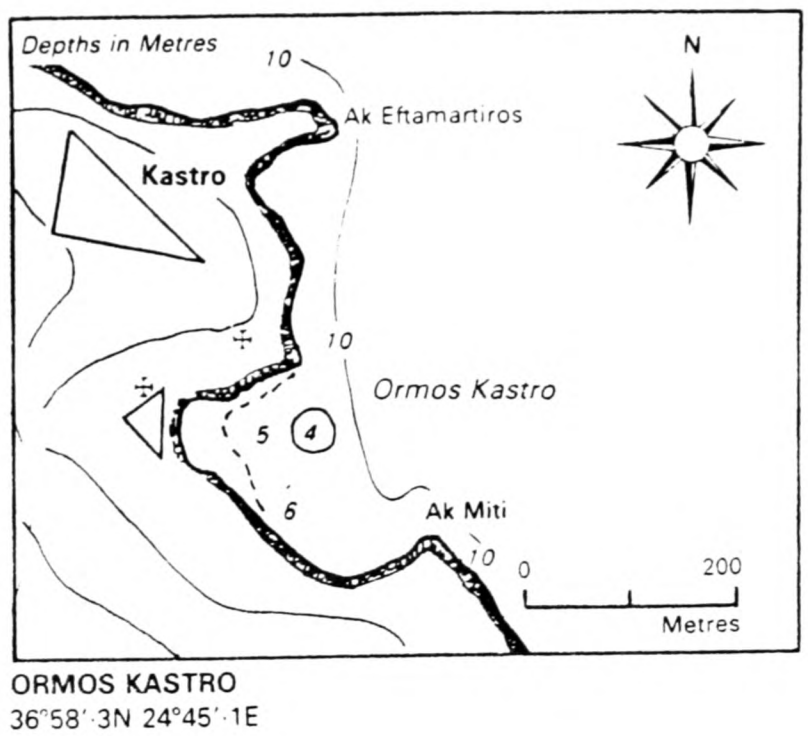


FIG. 2.11: *Seralia Bay after Heikell 1994: 250.*

To the south of Vlasi, Tsokha bay is more sheltered due to the long, steep promontory of Khondropou which extends along the north side (*Pl.I.67*). Vlikhada and Khokhlakoi bays are sufficiently indented to provide points of anchorage, and, with steep surrounding slopes, offer some shelter against northerlies, but are open to the west (*Pl.I. 68-69*).

The 'shallow lagoon-like inlet' of Vathi looks out directly upon the islands of Poliegos, Kimolos and Melos to the south-west (*Fig.2.9, Pl.I.55-56*), and is considered by the *Greek Water Pilot* to provide the best all-round shelter on Siphnos — a combination of its gently shelving sand bottom and protection against sea swells.[153] Vathi is approximately 3 hrs walking distance from the centre-east of Siphnos. Plati Yialos may also be reached via a steep climb around the north of Katsistria hill, followed by a sharp descent to the east.

The sand-bottomed bay of Fikiada offers the closest anchorage to the Melos island group (*Fig.2.9, Pl.I.58-59*), although the bay is exposed to the south-west, which can cause an eddy effect around the southern promontory (*Fig.2.1*).[154] From Fikiada, communication with the rest of the island can be made via Vathi, following the line of valleys to the north, or via Plati Yialos, following the southern coastline over the steep and rugged promontory of Kaminaki.

Bays with southerly aspect

The bays of Plati Yialos ('Wide Beach', *Fig.2.10, Pl.I.60*), Apokofto (*Fig.2.10, Pl.I.61-62*) and Faros ('Lighthouse', *Fig.2.10, Pl.I.63-64*), which lies approximately 1.5-2 hrs walk from Kastro, are open to strong gusts from the south in winter months, but the sand bottomed bays provide good anchorage and beaching, and provide excellent shelter from northerly and westerly winds.[155] Faros operated as the primary port for Siphnos in more recent historical times,[156] and may have functioned likewise in antiquity.[157]

Several smaller anchorages — Tourkavlako, Khlakopo and Sarli, each offering shelter to various degrees from northerly and westerly winds — also lie on the south coast. Khalakopo is the most sheltered of these, and is open only to the east. The off-shore islet of Kitriani provides an alternative location for anchorage, forming a sound opposite the south coast. The islet also contains a number of small inlets which can offer some shelter, with the south side of the islet offering anchorage in lee (i.e.

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[153] Admiralty Hydrographic Office 1945: 468; Philippson 1952: 77; Heikell 1994: 249. Buchon 1911: 188 gives an account of a night sailing between Amorgos and Siphnos on October 20th/21st 1841, 'We had been obliged to hold to the cape; and at six o'clock only were we able to enter the port [of Vathi] which is very narrow.'

[154] Philippson 1952: 77. *cf.* Dear & Kemp 1987: 55, 'Points of land or other similar obstructions produce eddies. They can also be formed by particular winds, especially on mountainous coastlines where the wind can be deflected or accelerated by the contours of the coast and act on the surface water of the sea to give it a temporary eddy.'

[155] Admiralty Hydrographic Office 1945: 468; Heikell 1994: 250.

[156] Faros was also known as 'Cuma' or 'Skala' (Leake 1856: 158, 156). For evidence of Venetian merchant shipping based at Siphnos, Coronelli 1696: 236; Thiriet 1961: vol.3, 42 (no.2367 of 23 IX 1434), 60 (2443 of 1 VI 1436).

[157] See above p.64.

protected from prevailing northerly winds).[158] It is worth noting to this effect that Kitriani, 'the island lying opposite the *chora* of the Siphnians', was a suspected mooring spot for pirates in Hellenistic times.[159]

Bays with easterly aspect

The east coast of Siphnos, facing the Paros island group, contains few natural anchorages beyond the small coves of Napos, Kalapodia, Prosfiri, Avlaki and Agriambela (although Agriambela at least appears to have operated at one time as an anchorage for local potteries).[160] From Ayios Sostis north to Akrotiri Kheronisou, even heavily indented inlets such as Rikhakia, Akhlada and Vlikhada are exposed to northerly winds and strong swells (*Fig.2.7*).

Indeed the only anchorage of note is the rocky cove of Seralia, which lies immediately below and to the south of Kastro (*Fig.2.11, Pl.I.65*) and approximately 40 minutes from the inland villages in the Apollonia region.[161] It is reckoned to be, 'suitable only in calm weather, being entirely open to the prevailing northerlies.'[162] Seralia seems to have operated as a harbour at some periods, since remains of a (probably medieval) landing platform stretch for some 5m into the shelving bay. The evidence of Isokrates XIX.19, where a night sailing from the *asty* of Siphnos (Kastro) to Paros is described, would also suggest its use as a harbour, although the sailing was undertaken in rather exceptional circumstances.[163] However, Seralia appears unsuitable for the stationing of any ancient naval vessels,[164] which further supports the suggestion of Faros as the main ancient harbour.

CONCLUSIONS

Chapter 2 has drawn attention to three general points of significance to the whole thesis:

1. The suitability of the Siphnian *chora* for the study of the economic geography of the ancient Greek countryside, and the limits of the evidence.

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[158] For anchorage in lee of off-shore islands, Kemp 1988: 473; Blue 1995 Fig.IV.10.vi.

[159] *IG* XII, 5.653.29-30 (a Hellenistic decree of Syros), 'ἡ ἐπικειμένη ἀπέναντι νῆσος τῆς χώρας τῶν Σιφνίων'.

[160] Admiralty Hydrographic Office 1945: 468.

[161] Gkion 1876: 163.

[162] Heikell 1994: 250. Sonnini 1801: 265 (if from personal autopsy) reckoned, 'Cette île n'a point de ports, si ce n'est pour de petits bâtimens; le lieu le plus considérable, que l'on nomme *Serai*, est construit sur des rochers escarpés, qui ne laissent au-dessous du bourg qu'une très-petite anse où les bateaux jettent l'ancre, mais non pas pour long-temps, parce que si le vent du nord les y surprenoit, ils seroient bientôt brisés à la côte: l'on se hâte de tirer à terre ceux du pays aussitôt qu'ils sont déchargés.' Also Randolph 1687: 38.

[163] The speaker claims that the countryside was watched (ἐφρουρεῖτο μὲν γὰρ ἡ χώρα). Reger 1997: 13 argues that this easier access to the sea meant that Kastro won out over Ayios Andreas as the main settlement on the island from the Archaic period.

[164] Morrison & Williams 1968: 67-8, 128-131 for the location of ship-sheds.

2. The salience of the insular environment in which the study takes place.

3. The usefulness and limitations of methodologies which address questions of regional, insular archaeology.

Chapter 2 has also demonstrated the following specific points of relevance to the analysis of rural sites in following chapters:

4. The complex interaction between humans and their environment over a long time period, together with dynamic climate and tectonic activity, has altered some aspects of Siphnos' physical environment since antiquity, most notably its metal ore resources. However, evidence of wholesale ancient deforestation or soil erosion on the limestone mountain areas is lacking.

5. Mineral resources were spread throughout the eastern, southern and western countryside of Siphnos, often situated high on steep mountain slopes. As a consequence, any exploitation of such resources using pre-mechanised equipment would favour a large and local workforce. The island is well supplied with stone and iron resources for internal consumption, but was also endowed with mineral resources (silver, lead, talcum schist, and possibly gold) which at certain periods in classical antiquity were exploited as commodities for export. The case of the Siphnian potters in more recent times shows how long-distance movements of raw materials, goods and workers might co-exist with an agrarian economy.

6. The numerous boundaries of impermeable schists and permeable crystalline limestone rocks create springs in several rural areas which make the island, despite its low annual rainfall, relatively well provisioned for water in the north, centre and west, with the east coast more dependent upon supplementary sources from cisterns.[165] This enables the opportunity for dispersed rural habitation.

7. The physical geography and geology of the island favours dry cereal (barley) cultivation in the flatter south-eastern side of the island, while the steep-sloped, mountainous areas of the island offer opportunities for cultivation of olives, vines, fruits and animal husbandry. The geological composition of the island provides micro-fragmentation of agrarian resources. Characteristic of Siphnos are niches of alluvial and schist soil which, in combination with the island's water supply, offers the opportunity for intensive arboriculture.[166]

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[165] Thus Philippson 1901: 59 on the 'magnificent watersources of Siphnos'.

[166] Vielweib 1983: 125.

8. The maritime resource of Siphnos has tended to be overlooked by some scholars, who have dismissed its potential as fit 'only for caboteurs' rather than a navy.[167] However, the fact that the island can provide 'good, small harbours' is of great historical importance to the local economy, as documented in the case of the Siphnian pottery industry, where wares were loaded directly onto small ships in many of the small inlets on the island.[168] They provide good opportunity for communications with the Melos island group to the south-west, and the 'western string' of the Cycladic islands to the north and the Saronic gulf beyond. In addition, the sheltered anchorages on the south coast offer more indirect maritime communication with the eastern Cyclades.

9. The diverse distribution of certain agrarian and non-agrarian resources throughout the countryside (e.g. mineral resources, opportunities for garden and arboriculture cultivation) required intensive labour for their exploitation. Intensive fruit and vegetable gardening, the exploitation of mineral resources, animal husbandry (including apiary and dove rearing), and the human 'service' resource of sailing have all been features of the Siphnian economy in historically documented periods.[169] The following chapters undertake to analyse the archaeological record of Siphnos, and indicate, through the type and distribution of its economic geography, the extent to which such a 'mixed' economy also existed in antiquity.

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[167] Tsountas 1899: 74. Bérard 1927: 158 follows Tsountas' pessimistic appraisal of Siphnos' harbours. Arrian II.13.4 for the arrival of 100 Persian warships in Siphnos to meet the Spartan King Agis III in 333 BC (Bosworth 1980: 223).

[168] Philippson 1901: 59. See also Tournefort 1741: 185 for the prosperity brought to the island during Ottoman rule in the 17th century, 'The ports of Siphanto were pretty much frequented about fifty Years since: one *Basili*, a rich trader of this Island...drew thither by his Industry and Ingenuity a great Resort of Ships from France and Venice.'

[169] Philippson 1952: 79.

CHAPTER 3

THE ARCHAEOLOGICAL RECORD OF RURAL SITES

HUMAN LANDSCAPES ON SIPHNOS

In order to provide a topographical and chronological context to the rural sites discussed below, the following section provides a survey of archaeological sites on the island (*Fig.3.1*) which form, 'strata of superimposed landscapes, the results of successive crystallisations which register the modifications of the environment and human societies.'[1]

ANCIENT AKROPOLEIS

Ayios Andreas

Situated on the summit of a low mountain on the ridge of Profitis Elias, the akropolis (named after the local church on the same summit) covers approximately 110 m x 100 m (*Fig.3.2, Pl.I.37)*.[2] The perimeter double wall dates to the Late Mycenean period, with alterations made in the Late Geometric period.[3] One entrance, on the north side, led out towards Kamares, while the gate on the south east side led out towards Vathi and Plati Yialos. Sherds from Late Mycenean III B to Hellenistic times were found in the stratigraphy, although the exact chronology of post-Bronze Age settlement is uncertain without a final excavation publication.[4] The akropolis has been described as one of several tactically sited hilltop refuge sites in the Geometric Aegean,[5] although cultic activity has also been suggested on the site,[6] and one nineteenth-century traveller reported seeing the remains of stone theatre steps on the eastern slope of the hill.[7] The site has wide views over the south and east of the island, towards the Paros island group (*Pl.I.31*).

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1 Brunet 1992: 50-51.

2 Philippaki 1973: 102.

3 Philippaki 1973: 94.

4 Philippaki 1973: 100. Further preliminary reports in Philippaki 1976, 1977, 1978, 1979, 1980, 1981.

5 Snodgrass 1991a: 8; Fågerstrom 1988: 82-84.

6 Mazarakis 1997: 171 interprets a LG temple on the site; Buchon 1911: 205 claimed that the church of Ayios Andreas was built on the foundations of an ancient temple.

7 Buchon 1911: 205.

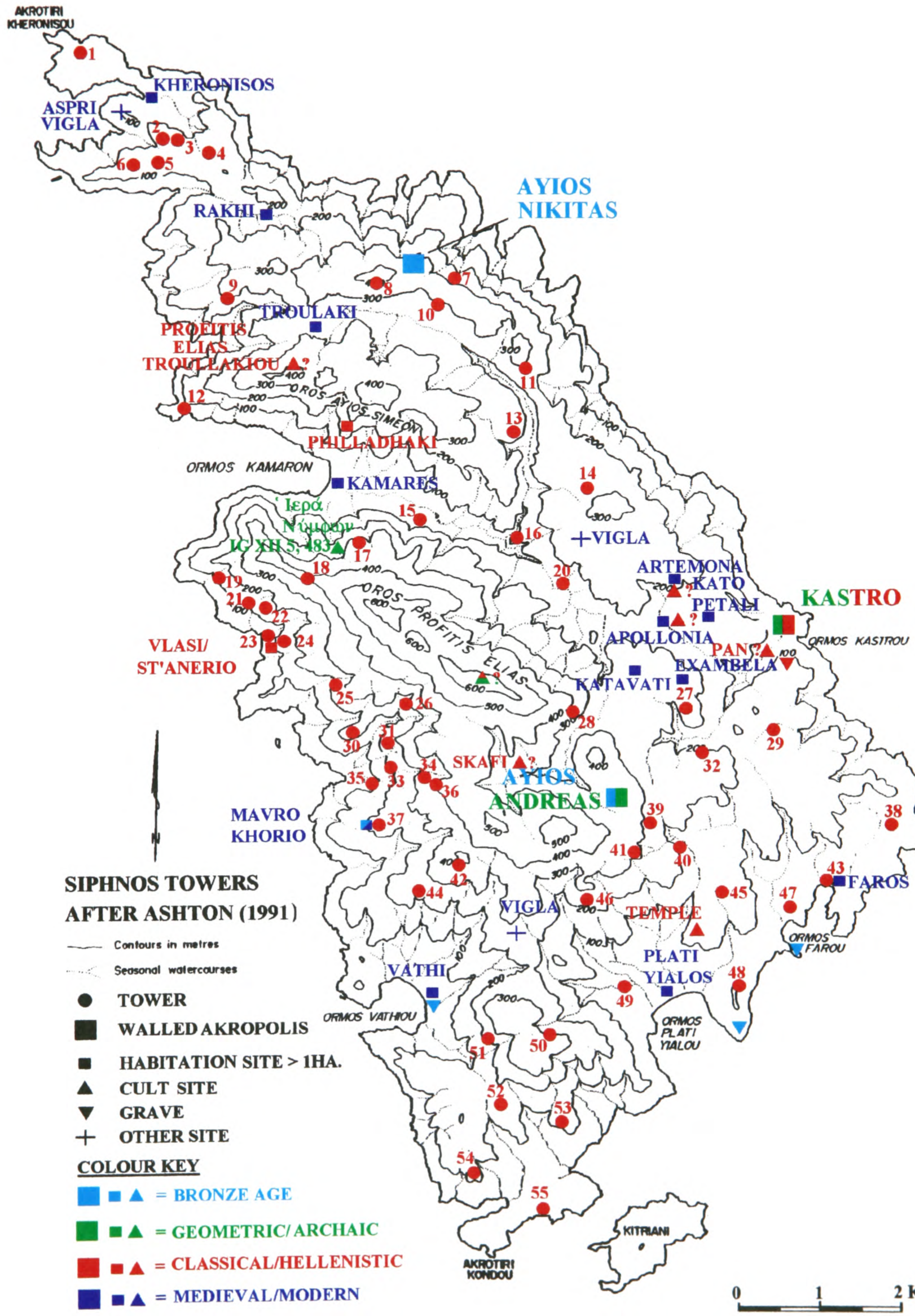

FIG. 3.1: *Recorded archaeological sites and settlements on Siphnos.*

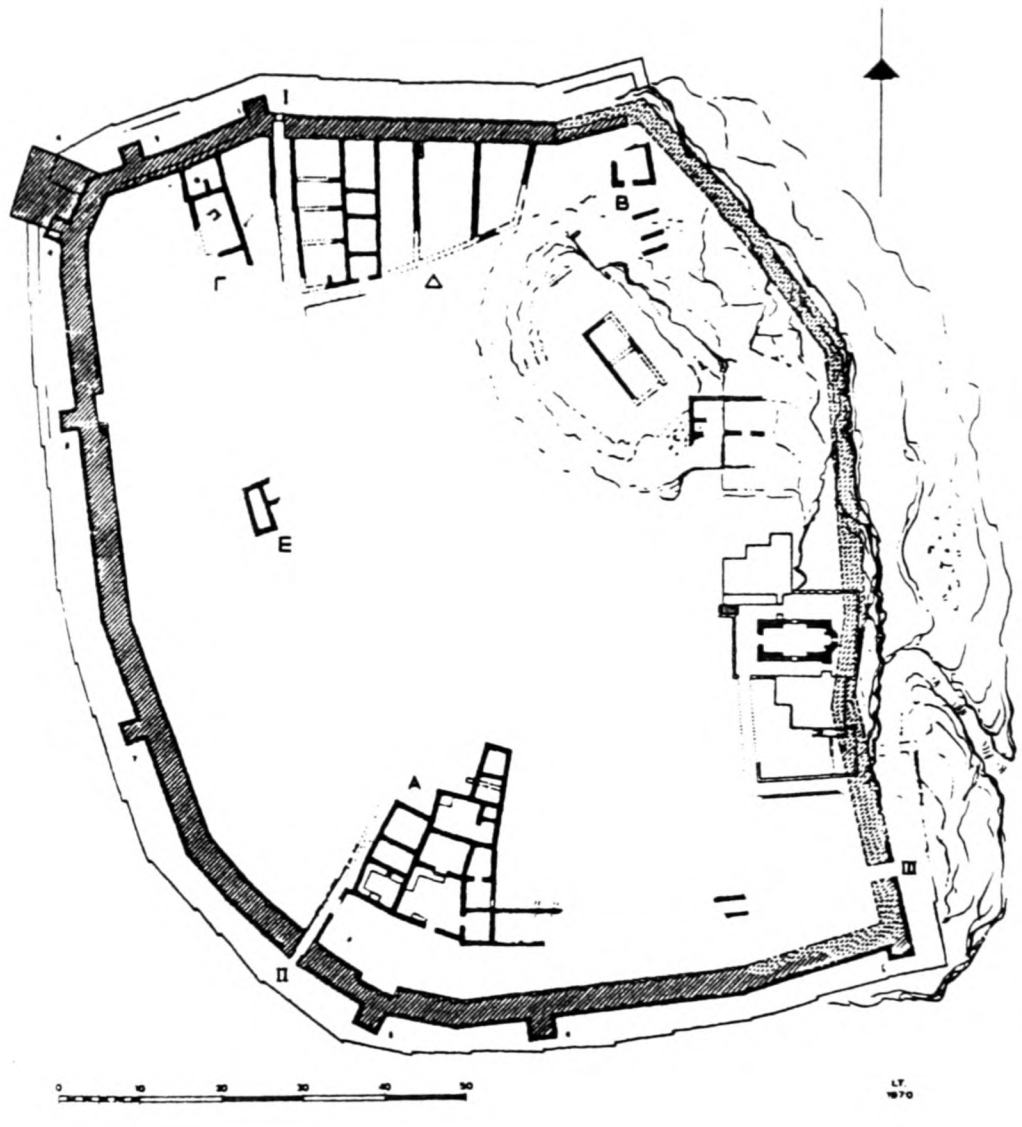

FIG. 3.2: *Plan of Ayios Andreas akropolis after Philippaki.*

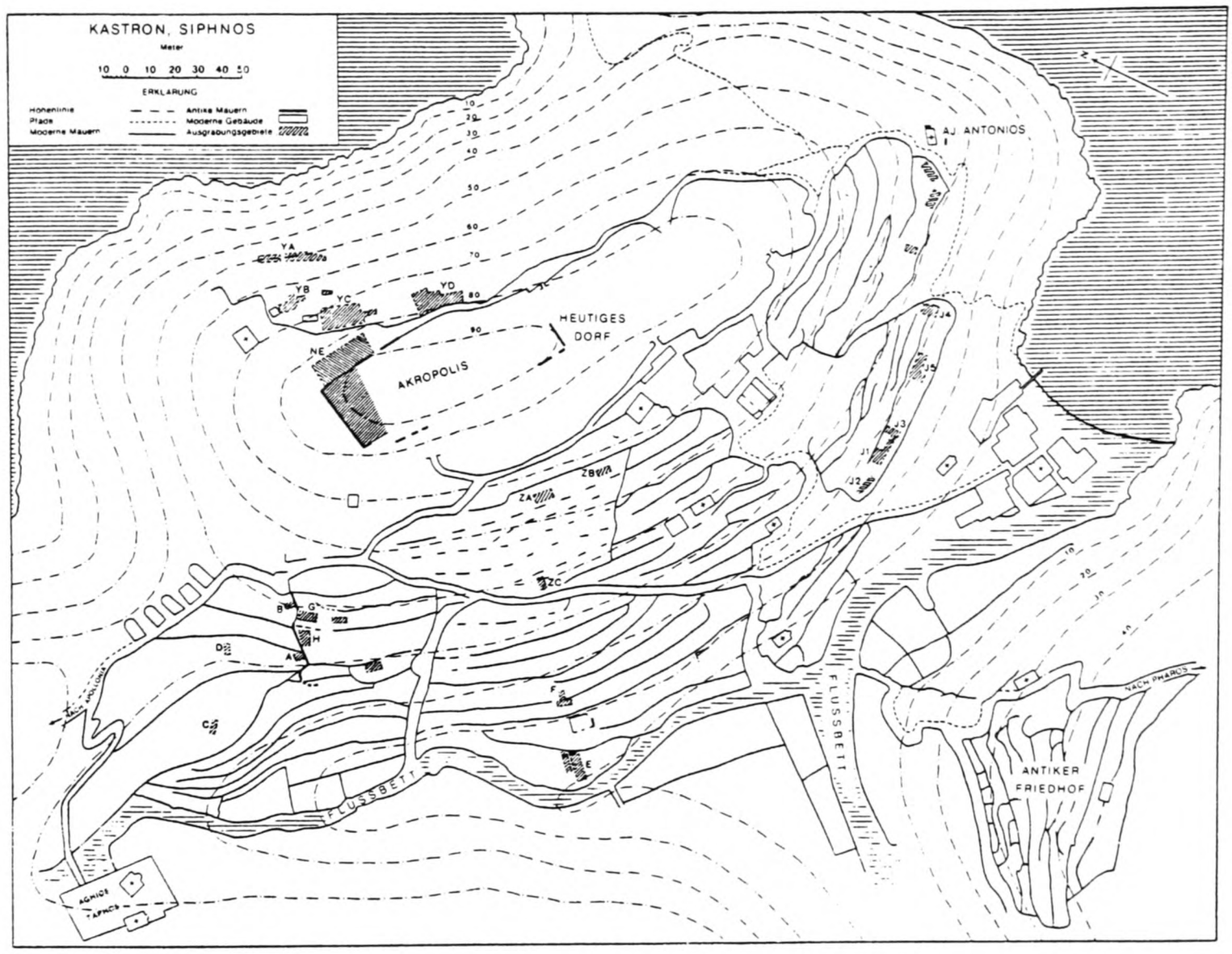

FIG. 3.3 *Plan of Kastro akropolis after Brock and Mackworth-Young 1949.*

Kastro

The akropolis of Kastro ('Castle'), which lies above the south-east coast and has extensive views towards the Paros island group, has been only partially excavated, due to the presence of medieval and modern settlement which lies on the plateau stretching approximately 200 m x 50 m (*Fig.3.3*, *Pl.I.38*).[8] Excavators found no trace of habitation between the Middle Cycladic and Early Geometric periods,[9] with the earliest Iron Age pottery dated to the eighth century BC in a series of domestic walls and buildings, and a marble akropolis wall of ashlar isodomic masonry, probably dating to the Late Classical period.[10]

The finds of several Classical and Hellenistic public inscriptions, together with the remains of monumental statuary, has supported the assertion that Kastro was the *asty* of the ancient *polis*, and ceramics indicate continuous habitation between Archaic and Roman times.[11] A cemetery on the hill to the south of Kastro contained graves from Late Geometric to Roman periods,[12] and the remains of an ancient temple (attributed to Pan by some travellers) were reported in the Erkies valley.[13] The excavators also recorded a site, 'situated about half an hour's walk from Kastro on the road to Pharos', suggestive of a hamlet which had been occupied continuously from Archaic to Roman times.[14]

Ayios Nikitas

An unpublished akropolis lies at the site of Ayios Nikitas chapel in the north east of the island (*Pl.I.39-40*). In the absence of excavations, no clear dating of the structure has emerged: the fortification walls appear to date from the Late Bronze Age, although an Archaic phase of occupation has been proposed on the grounds of surface pottery.[15] No further site chronology is known.

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[8] Brock & Young 1949; Stillwell 1976: 842; Fågerstrom 1988: 80-82; Ekschmitt 1993: 173-179; Lang 1996: 181.

[9] Brock & Mackworth Young 1949: 33.

[10] Brock & Mackworth Young 1949: 2-9.

[11] *IG* XII 5, 480.1-5. Also *SEG* I 346, 347 (see Daux 1970; Sheedy 1988, 1992).

[12] Brock & Mackworth Young 1949: 16. The contents of many graves had been looted.

[13] Bent 1965: 32, 'The ruins of this temple were converted into a little church, and the spot is still called "goat's foot" (τραγόποδι) from the statue of Pan.'

[14] Brock & Mackworth Young 1949: 18. Unfortunately the site was not recorded on their map, and subsequent attempts to locate it have proven fruitless (pers. comm. Richard Catling).

[15] Ashton 1991: 52; Preziosi 1994: 53.

ANCIENT RURAL SITES

Bronze Age sites

At the village of Mavro Khorio ('Black Village'), immediately adjacent to tower **37**, there is evidence of intermittent, settlement from the Late Bronze Age to post-Medieval times.[16] The sequence of habitation, abandonment and re-settlement is unclear without excavation, but as has been noted in preliminary survey, several buildings and walls, which re-use tower masonry in upper courses, may also possess ancient foundations.[17]

An Early Cycladic site including graves (and possibly a settlement), together with Mycenean tombs at Vathi were excavated by Tsountas in the late nineteenth century and were briefly published.[18] A burial site at Soroudi on the east tip of Plati Yialos is also attributed to a Bronze Age date.

Archaic/Classical/Hellenistic sites

Philladhaki

The site of Philladhaki, located 250m above sea-level on the slopes of Mt. Ayios Simeon overlooking Kamares bay, comprises a series of large walls, buildings and a stone platform approximately 11 m x 7.5 m (*Pl.I.41-45*), dated to the Hellenistic period.[19] Given its location, it seems unlikely that Philladhaki functioned as a regular settlement site. It has been suggested that the site may have acted as a refuge above the bay of Kamares, although the orientation of the large stone platform with a series of triangular niches would not rule out the possibility of cult activity.

Profitis Elias Troullakiou

Ancient foundations have been found under the church of Profitis Elias Troullakiou on the ridge of Ayios Simeon overlooking Kamares. They have been interpreted as the walls of an akropolis.[20] However, given the small size of the site, the foundations may more likely belong to a cult site.

Vlasi

The size and arrangement of buildings, walls, cisterns and ceramic scatters along an approximately 200 m stretch in the coastal area of Vlasi between towers **23** and **24** would seem to

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[16] Mycenean sherds - Fimmen 1921: 14; Leekley & Noyes 1975: 51. Classical sherds - Ashton 1991: 110-1. Mavro Khorio is marked as a 'Medieval/Modern' site >1ha. in *Fig.3.1* from the extant remains of the last phase of village settlement in the Venetian period, but earlier traces of on-site activity should not be ignored.

[17] Preziosi 1994: 67.

[18] Tsountas 1899. An Early Cycladic figurine was reportedly found at the site of tower **8** (Dragatsis 1920: 159), but without stratigraphic evidence, no judgement can be made on its context.

[19] Ashton 1991: 154-7.

[20] Ashton 1991: 19, 156.

suggest a Classical-Hellenistic settlement of an order larger than a single farmstead (*Pl.23.2, 24.2*).[21]

Cult sites

In the locality of Kamares at Korakies, a cave dedicated to the Nymphs was recorded.[22] In the south of the island, at the later site of Panayia tou Vounou, several travellers noted that the church was built upon the foundations of an ancient temple (*Pl.I.46*), which some have identified with Pan.[23] Topographical research has suggested the presence of ancient foundations, possibly connected with cult activity, at the church of Skafi, and the monastery of Profitis Elias.[24] In addition, the villages of Artemonas and Apollonia are associated with the respective cult sites of Αρτεμις 'Εκβατηρία ('Artemis of Disembarkation') and 'Απόλλων 'Εναγρος ('Apollo in the Field') while a cult of Ζεὺς 'Επιβήμιος is also attested in a lexicography of Hesychius (perhaps to be associated tentatively with mountain-top sites on Profitis Elias or Ayios Simeon).[25]

MEDIEVAL AND MODERN SETTLEMENT PATTERNS

Villages

Kastro appears to have functioned as the aristocratic centre and capital of the island into the eighteenth century AD, with a population of several thousand at certain times.[26] In addition, nine or ten villages across the island are reported by the seventeenth century AD, although the names vary from reports of travellers (*Fig.3.1*).[27] However, it is clear that the densest concentration of nucleated settlements was located in the south-east of the island forming, 'an almost continuous network on the central plateau.'[28] The villages of Artemonas, Apollonia, Pano and Kato Petali, Exambela and Katavati appear to have existed from at least the time of Ottoman rule.[29]

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[21] See below pp.150-158.

[22] *IG* XII 5, 483, 'Ιερά Νύμφων. (Ross 1840: 144). Jeffrey 1990: 296 dates the inscription to the late Archaic (*c.* 500 BC).

[23] Bent 1965: 36, '[The church] is built with the pillars of an old Doric temple.' Also Coronelli 1696: 236; Pasch di Krienen 1773: 116; Van der Vin 1980: 94. However, for its identification, see above n.13.

[24] Preziosi 1994: 54.

[25] Hesychius, s.v.' Εκβατηρία,' Εναγρος,' Επιβήμιος. Stephanus Byzantius *Ethnika* 105-6 mentions Apollonia as a πόλις, together with another site called Minoa (Stephanus Byzantius *Ethnika* 454). Ross 1840: 146 remarked on a dense scatter of Classical/Hellenistic sherds around **47** and interpreted it as a habitation site (*cf.* Bent 1965: 36 who associates the site with Minoa). Whitehead 1994b for discussion of site-classification and reliability of πόλις attribution in Stephanus.

[26] Thévenot 1665: 207; Tzakou 1984: 9.

[27] Tzakou 1983: 183; Riedl 1983: 20-21.

[28] Pash di Krienen 1773: 114; Buchon 1911: 193; Tzakou 1983: 188.

[29] Tournefort 1741: 185; Leake 1856: 157. No settlements are marked on Leake's map for Plati Yialos, Vathi, Mavro Khorio, Kamares, Troulaki, or Kheronisos, but it appears that little topographic research was conducted outside the south-east of the island.

The administrative centre of the island moved from Kastro to Apollonia,[30] reflecting a move in population in the eighteenth and nineteenth centuries AD. This was ostensibly due to the threat of piratical incursions, but is perhaps better explained as part of a wider socio-economic transformation from Ottoman to Independent Greece, away from the traditional aristocratic centre of power at Kastro to settlements in the most fertile area of the island.[31] In the north of the island, small villages are attested at Troulaki and at Kamares,[32] which has undergone considerable change in the nineteenth and twentieth centuries, first as the focus of the mining industry, and later due to tourist development.[33]

Monasteries and other rural sites

Monasteries

Monasteries at Vrisi, Ayios Simeon, Profitis Elias, Panayia Tosou Nerou and a large Nunnery at Panayia tou Vounou acted not only as centres of religious worship and the focus of island-wide festivals, but also exerted a strong influence on patterns of land holding, and served as refuge sites.[34] The strong ecclesiastical pull attracted initiants from all over the Cyclades, who comprised a significant portion of the island's total population during the period of Ottoman rule.[35]

Other rural sites

Rural structures belonging to farmers and artisans are attested in the archaeological record of the modern period. *Thimonies* (single storey stone buildings) are common in once cultivated arable areas of the island, and functioned as seasonal homes for farm labourers from the villages during harvest time.[36] Rectangular in shape, these structures comprised a single, un-partitioned living space around a hearth, and were often associated with adjacent threshing floors, stone presses and dovecotes. Homestead potteries were located at numerous bays in the island, including Kheronisos, Vroulidia, Artimoni, Vathi, Fikiada, Plati Yialos, Apokofto and Faros.[37]

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30 Also called Stavro ('Cross') as the nexus of communication between villages in the south-east of the island.

31 Buchon 1911: 192-193; Tzakou 1984: 12.

32 A settlement at Kamares was marked on Buondelmontius' 1474 map (Legrand 1897).

33 Tzakou 1979: 57, 1983: 190.

34 Gkion 1876: 58-59; Tzacou 1983: 183. According to Sebastiani 1687, over 10% of the island's population of 3,500 were either priests, monks or nuns (Simopoulos 1970: 580). 30 priests, 2 monasteries with 40 monks, and another 3 with 100 monks were recorded.

35 Wheler 1682: 49; Spon & Wheler 1724: 99.

36 Tzakou 1984: 31.

37 See *Map 1*.

Long term settlement and population patterns

> 'The rural Greek population has quite literally been in motion for centuries...If Greek villages have indeed been in a state of flux for many centuries, what is one to make then of the points which sometimes seem to exist between these settlements and those of antiquity?'
> Sutton 1990: 594-595

The fluidity of long term Aegean settlement and population patterns is a phenomenon familiar to anthropologists of the area,[38] and appreciation of its consequences for our understanding of ancient rural populations is becoming increasingly widespread.[39] On Siphnos, evidence of considerable 'elasticity' both in the long-term island population trends (*Table 3.1*), settlement patterns, and in short-term, seasonal mobility, is well attested for the historical period of the last 500 years.[40]

The towers of Siphnos do not feature in any surviving written document from antiquity, and today the individual Siphnian towers are known either by descriptive names, e.g. *Aspros Pyrgos* ('White Tower' - **48**) or by the locality in which they are situated, e.g. *ston Ambourdekhti* ('Water Receiver' - **5**).[41] However, it is within such a long-term historical-topographical context that these essentially 'prehistoric' monuments are located spatially and temporally, and in such a situation the most fruitful approach to investigating their use is archaeological, to which comparative evidence drawn from historical, epigraphic and ethnographic sources may also contribute.

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[38] Especially Kolodny 1974; Sutton 1988; 1994.

[39] Cavanagh 1991: 103-4, although acknowledging the difficulty of finding direct historical attestation of rural population fluctuation in ancient Greece, recognises, 'how, through mechanisms of change such as that indicated with the short span of the family, the basic pattern of rural settlement in Ancient Greece could be open to the transformations which are increasingly indicated by the archaeology of survey as well as by historical analysis.'

[40] Slot 1982: 14 for the relatively high population density of the island in 17th-century AD Aegean, attributable to the prosperity from merchant shipping based there. N.B the population of 4,500-5,500 in the census of 1880 (Gkion 1876: 161) gives a population density between 60-75 persons/km^2, significantly higher than the overall population densities for Greece at the time (Sallares 1991: 75 on 1880 census figures giving a population density of 32.5 people/km^2 for Greece, excluding Thessaly, Makedonia and Thrace; Garnsey 1988: 90 on a rising density of 15.8-37.6 persons per km^2 in Greece between 1838-1896.

[41] Likewise the Dema tower (and wall) in the Parnes-Aigaleos region of north Attika, not mentioned in any extant literary sources, is known by its modern Greek name and has been investigated primarily through archaeological means (Munn 1993: 11).

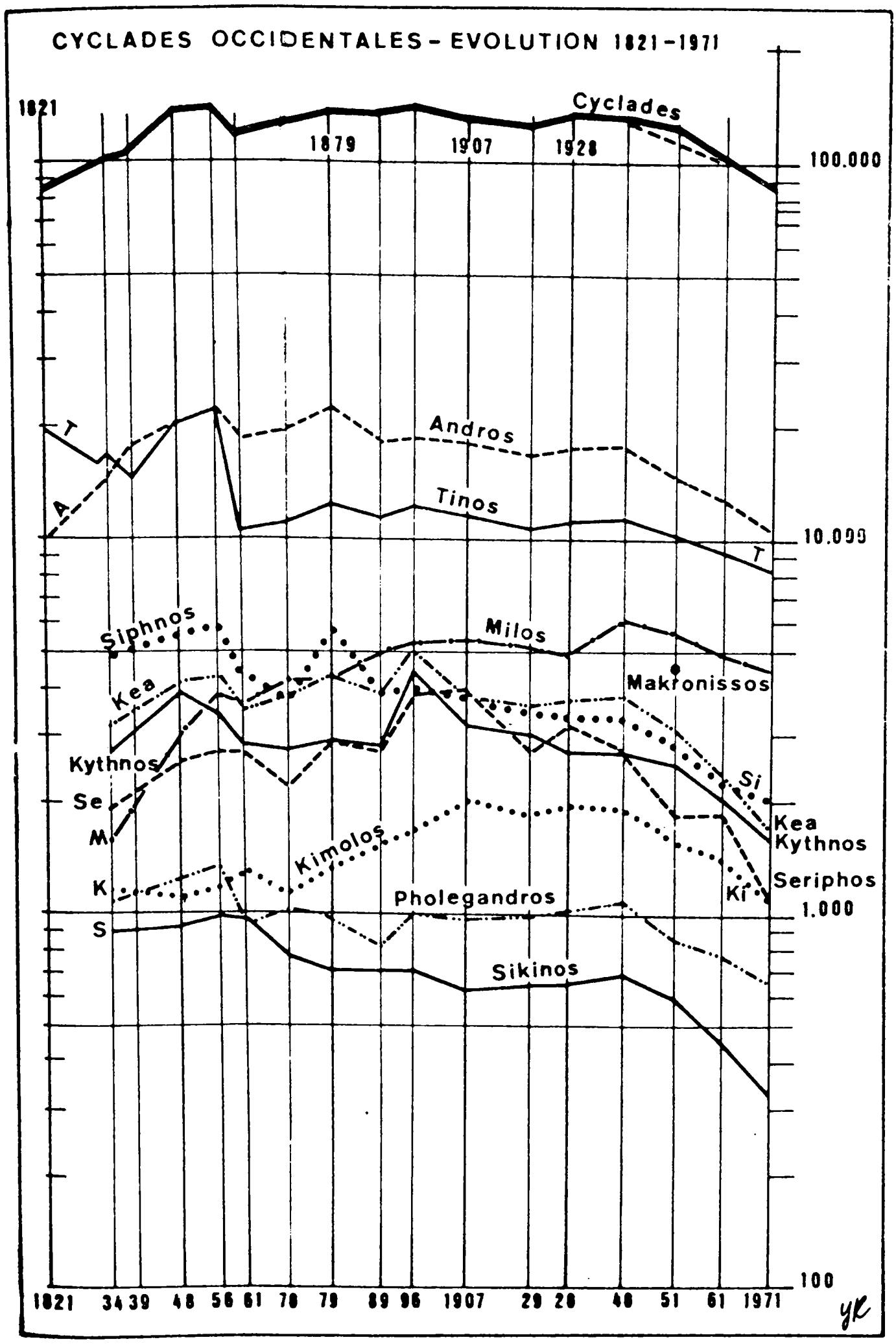

TABLE 3.1: *Recorded population of Siphnos 1821-1971 in comparison to other Cycladic islands after Kolodny 1974.*

THE ARCHAEOLOGICAL RECORD OF TOWER SITES: PRESERVATION, IDENTIFICATION AND DATING OF SITES

> Ασκρης μὲν δὴ πύργος εἷς ἐπ᾽ ἐμοῦ καὶ ἄλλο οὐδὲν ἐλείπετο ἐς μνήμην
> Pausanias IX.29.2
>
> Of Ascra in my time only one tower and nothing else was left behind for posterity...

Research into rural sites on Siphnos has been pursued for over a century and a half in a number of occasional excavations, extensive site surveys, and local topographical studies (to some extent chance discoveries supplemented by information from local residents), which has increased the number of known sites to a current total of 55 (*Table 3.2*).[42] Thus, although the present record of Siphnian rural sites is not the product of an intensive survey project, the numerous sites can nonetheless provide the basis of an investigation into the economic geography of the ancient countryside, once factors affecting the archaeological visibility of those sites have been considered. The following chapter evaluates the effects of site alteration and destruction upon the archaeological record of Siphnos. Methods of site dating are discussed, and hypotheses concerning the functions of rural sites are examined.

PRESERVATION AND IDENTIFICATION OF RURAL SITES

Pausanias's rhetorical observation on the archaeological visibility of Hesiod's home in later antiquity succinctly reveals the bias of archaeological survival towards monumental construction in the overall record of 'superimposed landscapes', a factor which has been recognised by modern archaeologists engaged in a holistic approach to the ancient countryside.[43] Nonetheless, it is also clear that the ability of such objects to 'outlive' the material residues of contemporary activities, and to stand as relatively well-preserved topographic and mnemonic structures (in the context of long-term landscape history) means that they offer an unparalleled opportunity to investigate the man-made infrastructure of the ancient countryside.

The overall distribution pattern of recorded rural sites is inevitably incomplete, even in the most intensive conditions of survey; however, site visibility is also affected by the problem of site destruction (caused by both ancient and post-antique human activities and natural events such as earthquakes) which has sometimes reduced these once prominent structures to foundation level,

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[42] Preliminary excavation work was carried out at the sites of *Laouteri* (**18**) and *Aspros Pyrgos* (**48**) by Dragatsis, although no full reports were ever published. In addition, separate architectural studies of individual towers have been published (Haselberger 1978a on **20**, **27**, **48**; Hohmann 1983 for an architectural study of **48**).

[43] Brunet 1992: 48.

making subsequent identification uncertain.[44] For example, ancient re-use and alteration has been documented on Lefkas, where quadrangular towers were constructed in later (Hellenistic) levels at three round tower sites, perhaps as part of a general expansion, or at least re-use of these sites.[45] In cases where towers (or parts of towers) were rented property, lessees might be charged with the supervision of ongoing repairs (which might feasibly include anything from routine work to major reconstruction).[46]

Late-antique over-building and cult activity (as well as modern 'treasure' digging) have also contributed to alteration of some tower sites.[47] In some areas, mortared Frankish towers tended to occupy ancient sites, but appear not to have re-used ancient dry stone tower masonry.[48] Scatters of stone masonry, whether through natural or human agency, may also contribute to the destruction of *in situ* masonry, if the material is later utilised in other building structures.[49] Threshing floors, windmills, churches, field walls and industrial sites, such as lime kilns, might all incorporate individual blocks, or even subsume the original plan altogether.[50]

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[44] Langdon 1982: 98 n.22. Boussac & Rougemont 1983: 115 n.10 on problems relating to tower identification on Amorgos. Cherry, Davis, Mantzourani 1991b: 286, Brunet 1988a: 170-190 on the identification of possible tower foundations in the territories of Koressos (Keos) and southern Thasos respectively.

[45] Dörpfeld 1927: 258-260; Dousougli & Morris 1994: 216 n.5. *cf.* the square structure of polygonal masonry found in the enclosure of the Karydhi round tower, Attika (Munn 1983: 439 fig.6; Ober 1985: 164-165).

[46] E.g. *ID* 1417, B, col. II.92 (with Kent 1948: 251 n.18), where the lessee of a χώριον is to repair the tower (ἐπισκεῦαι τὸμ πύργον). See Saprykin 1994: 14-26 for phases of construction and alteration at Plot No.9 in the Herakleian peninsula, including expansion of a tower complex. Saprykin identifies 'at least five construction phases', dating the first to the Late Classical/Early Hellenistic period, although the evidence on which these phases are identified and dated needs more caution in the light of discussion below p.98.

[47] Lohmann 1993a: 142-3, 162-3; Munn 1993: 87. Towers were still being (re-) used on rural properties in second-century AD Attika as epigraphic data attests (*IG* II^2 2776.14-5, 24, 65-7, 115-8; Miller 1972: 67-93; discussion of re-use in Munn 1983: 71 n.65). Biblical sources also indicate their use in the Eastern Mediterranean during Old Testament times (Meyer 1920: 100), while New Testament sources confirm their agricultural use in Roman Imperial times, continuing at least until the mid-third century AD, when a tower in Palestine is included with a δεκανία, an (unkown) amount of land (*OGI* 615).

[48] Lock 1986: 103 for sites in Euboia; McLeod 1962: 390-392 for the Tower of the Princess at Kiveri in the Argolid.

[49] Ober 1987b: 586.

[50] Examples of tower masonry re-used in churches: Mantineia (Hodkinson & Hodkinson 1981: 248, including personal observation of modern building work which incorporated tower masonry); Attika (Keramopoullos 1931: 161); Boiotia (Camp 1991: 193-194); Keos (Cherry, Davis, Mantzourani 1991b: 85-6); Thasos (Kozelj & Wurch-Kozelj 1989: 175). Rebuilding of tower masonry into walls of *spitakia* on Lesbos, see Spencer 1995c: 28-29 sites 131, 134 (general destruction and re-use of masonry at Lesbos tower sites, Spencer 1995c: 58). Repair and re-use of rural enclosures in the Halikarnassos Peninsula, Radt 1970: 177, 187 n.16. On widespread rural construction activity in nineteenth-century Keos, due to the break up of large estates and re-organisation of land-holding, see Whitelaw 1994: 164. For lime kilns see Young 1956a: 138 n.42 on the cautionary tale of a round tower totally destroyed in the construction of a limekiln and factory. See also Jameson, Runnels, van Andel 1994: 304.

Author	No.	REPORTED TOWER NOS.	Tower Plans	Site Plan Nos.	Tower Dimensions	Map
Ross 1840: 144-6	5/9	20, 27, 43, 47, 48	no	no	no	no
Fiedler 1841: 134-6	3	27 (?), 47, 48	no	no	no	no
Leake 1856: 157-60	7	20, 26 (?), 27, 30 (?), 43, 47, 48	no	no	no	yes
Bent 1885: 21-40	3	1, 43, 47	no	no	no	no
Pollak 1896: 203-14	4	20, 27, 43, 48	no	no	no	no
+Dragatsis 1915-24	36	1, 4-12, 16-21, 25-27, 29, 30, 32, 34, 37-40, 43-45, 47-49, 50 (?), 53, 55	18, 20, 48	no	6/36	no
†Gryparis 1928	28		no	no	no	yes
+Young 1956b	24/38	1, 4-6, 7, 9-13, 19-20, 22, 25, 27, 30, 33, 37, 39, 45, 47-49, 55	yes	22, 45, 53	yes	yes
*Haselberger 1978; 1983		20, 27, 48	yes	20	yes	no
*Hohmann 1983		48	yes	no	yes	no
+Ashton 1991	51/55	1-6, 8-11, 13-15, 17-39, 41-55	yes	no	yes	yes
+Preziosi 1994	51/55	1-6, 8-11, 13-15, 17-39, 41-55	no	8, 17, 23, 25, 31, 37, 45, 53, 54	yes	yes
†Birkett-Smith 1995	51/55	1-6, 8-11, 13-15, 17-39, 41-55	no	no	no	yes
		+ = island-wide survey/catalogue				
		* = site specific study				
		† = map locating towers				

TABLE 3.2: *Previous surveys of towers on Siphnos, indicating (where information is available) sites visited, dimensions recorded, plans drawn of towers, sites and maps.*

TOWER NO.	DESTRUCTION	TYPE OF ACTIVITY	DISPLACEMENT OF MATERIALS
44	PARTIAL	(MODERN) BUILDINGS/WALLS	ON SITE
43	PARTIAL	BUILDING/SUBMERSION	SUBMERGED
9	PARTIAL	LIME KILN	ON SITE
49	PARTIAL	RIVER BANK SUPPORT/WALL	ON SITE - 50m
39	PARTIAL	ROAD CONSTRUCTION	ON SITE
45	PARTIAL	ROAD CONSTRUCTION	ON SITE
4	PARTIAL/RE-USE	FARM BUILDING	ON SITE
38	PARTIAL/RE-USE	FARM BUILDING	ON SITE
46	PARTIAL/RE-USE	FARM BUILDING	ON SITE
15	PARTIAL/RE-USE	MODERN BUILDING	ON SITE
36	PARTIAL/RE-USE	FIELD WALL	100m
47	PARTIAL/RE-USE	FIELD WALL	50-100m
22	PARTIAL/RE-USE	(MODERN) FIELD WALL	50m
6	PARTIAL/RE-USE	MONOPATI WALL	ON SITE
14	PARTIAL/RE-USE	RETAINING WALL	ON SITE
2	PARTIAL/RE-USE	MODERN THRESHING FLOOR	ON SITE
20	PARTIAL/RE-USE	MODERN THRESHING FLOOR	ON SITE
51	PARTIAL/RE-USE	MORTAR/PATCHED MASONRY	ON SITE
30	PARTIAL/RE-USE	PATCHED MASONRY	ON SITE
33	PARTIAL/RE-USE	PATCHED MASONRY	ON SITE
32	PARTIAL/RE-USE	WINDMILL	ON SITE
16	TOTAL	QUARRYING ?	?
7	TOTAL ?	?	?
12	TOTAL	?	?
40	TOTAL	?	?
	PARTIAL = destruction affecting part of original tower plan		
	RE-USE = tower masonry re-used in later structure		
	TOTAL = entire tower plan no longer visible		

TABLE 3.3: *Site destruction and masonry re-use recorded at Siphnian tower sites, according to partial, partial/re-use, total destruction and type of activity.*

	A	B	C	D	E	F	G	H	I	J	K
1	1	0	0								
2	0	4	1	0	0	0					
3		0	0	0	0	0	0				
4		0	1	0	2	(1)	0				
5		(1)	0	0	0	0	1	0			
6			0	0	0	1	1	0	0		
7		0	1	1	2	(1)	1	0	0		
8			3	1	0	0	0	0	0	ASTY 0	
9			0	2	2	0	1	0	1	1	0
10				0	4	0	0	1	1	0	1
11				0	2	1	1	1(2)	1	2	0
12				0	0	0	0	0	1	0	
13				0	0	1	1	1	0		
14					0	1	1	0			
15					0	1	1				
16						0					

( ) = no. including reported towers no longer extant

FIG. 3.4: *Map of Siphnos indicating distribution of towers in 1km^2 grids after Birkett-Smith 1995.*

In some cases, pictorial, photographic evidence of destroyed towers may have to be relied upon in lieu of surviving material evidence, and in others only the descriptions of earlier travellers remain.[51]

In conclusion, adaptation, cannibalisation and occasional wholesale destruction of tower masonry (whether for other structures or industrial activity) ought to be considered an important factor affecting archaeological visibility in certain areas. No special case is required to plead the disappearance of large quantities of stone masonry since antiquity.[52]

Destruction or partial re-use, where it has been possible to ascertain activities affecting individual towers on Siphnos, is summarised in *Table 3.3*.[53] Factors include apparent antique alteration **(30)** (*Pl.30.2*), windmill construction **(32)** (*Pl.32.1*), threshing floor construction **(2)** (*Pl.I.2.1*), road building **(39, 45)** (*Pl.I.39.1*), and tourist development **(43)** (*Pl.43.1*).[54] In addition, towers **1, 14, 27, 34, 37, 49** all stand within 50m of country chapels, often a destination for the post-antique re-use of tower masonry.[55] The general absence of large post-antique settlement sites and the lack of substantial tourist development on the north, west and south-west sides of the island (with the exception of the expanded village settlement at Kamares), and the absence of metalled roads through these areas has likely assisted preservation there

However, the current distribution of recorded towers in these areas (*Fig.3.4*) may not solely be the product of site destruction in the south-east area of the island where modern settlement is concentrated, or be due to the fact that sites on limestone often tend to be more archaeologically visible than sites on other rock formations, due to less dense vegetation.[56]

DATING RURAL SITES

A common problem associated with the archaeology of monumental rural sites is the dating of their construction and subsequent use (their 'life-cycle'). Dating is usually attempted through analysis of ceramic evidence, either in excavation strata, or surface scatters, and the masonry styles

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[51] e.g. Camp 1991 on Rhakes tower. Jameson, Runnels, van Andel 1994: 500 fig. A.31 on Thermisi tower. Haselberger 1978a: 352 on the spread of masonry around the Palaiopyrgos tower on Paros. Similarly Kozelj & Wurch-Kozelj 1989 for masonry scatters at Thasian tower sites. On recent destruction of masonry and scatter of blocks in the vicinity at tower site of Hellenikon-Choreza on Andros, Koutsoukou & Kanellopoulos 1990: 163 n.15, 168.

[52] *contra* Cherry, Davis, Mantzourani 1991b: 287.

[53] Pasch di Krienen 1773: 115 additionally reports a tower located near the bay of Vathi, but in the absence of any further information, it is impossible to check whether the tower referred is **44** or another structure.

[54] The construction of a metalled road between Katavati and Vathi in November 1995 resulted in damage to tower **39** at Kadhi when stone chippings were tipped onto the west side of the tower, although the basic plan and structure survives (*Pl.39.1*)

[55] See n.50. Pseudo-isodomic masonry worked into a rubble field wall opposite the chapel of Παναγιά του Ηλιου is likely to have come from the nearby towers **34** or **36** and heightens the possibility that tower masonry may also be built into the chapel

[56] Rackham & Moody 1996: 6. See below Ch.5 for detailed analysis of tower distribution on the island.

employed in stonework.[57] However, neither approach is unproblematic, since excavation at a tower site may reveal nothing more than the paucity of diagnostic material.[58]

Recent ethnoarchaeological work has highlighted the role of abandonment as a key process in the shaping of archaeologically visible remains, and thus an 'orderly' abandonment — including the dismantling of structural materials (wooden frames, roof tiles) and the collection of movable property (furniture, storage vessels and domestic equipment) — may leave relatively little trace of otherwise archaeologically robust remains indicating pre-abandonment human activities.[59] Furthermore, where material evidence is deposited, for example surface sherd scatters on a site, it may not necessarily correspond to a period of tower use there, since the ceramics may be the remains of preceding activity or later (post)antique re-use.[60] The presence of walls that appear to be

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[57] e.g. Kaltsas 1985: 219 on problems of dating rural domestic complexes in Messenia. For attempts to establish relative chronology of rural sites through masonry style, see Radt 1970: 181-9, though the classification system of these sites in Halicarnassos peninsular is based on the assumption that there are identifiable 'Lelegic' and 'Greek' elements of architecture which categorise 'simple' and 'developed' forms of enclosure. *cf.* attempts of Carpenter & Boyd 1977 who ascribe the architecture of rural 'Dragon Houses' to ethnic groups (Karians) present as labour in the quarries of Greece (compare the earlier 'diffusionist' tower studies of Thiersch 1909; Schuchhardt 1929). Jameson 1994a: 56 on general problems concerning the date of dispersed, rural sites with reference to evidence from the Southern Argolid survey where the most intensive period of rural construction is dated to 375-275 BC.

[58] Munn 1993: 81 for excavations at the Dema tower in northern Attika and an attempt to date the structure to the first half of the fourth century BC. The only material found was of a later fourth-century BC date, which Munn claimed was from a 'secondary re-use' phase. Others argue that the lack of early fourth-century BC material makes a 'first' phase date in the second half of the fourth-century more likely (Ober 1985: 151); *cf.* Spitaels 1978: 44 on disturbed stratigraphy at Tower AX in Insula 3 Compound at Thorikos). For the difficulties in establishing the period of initial occupation at Thasian tower sites and rural complexes, Brunet 1988a: 199. Excavation of 'blockhouses' at several sites in the Argolid (Appendix 3.1) produced little in the way of diagnostic ceramic material between the Early Helladic and Christian periods (Lord 1941: 109; *cf.* Fracchia 1985: 684-687). Munn 1993: 70-71, 85 for similarly exiguous Classical remains from the excavation of the Dema tower. On the general paucity of material remains from excavated towers, Munn 1983: 91 n.177; Osborne 1992a: 22 n.3.

[59] Cameron 1993: 3-6. *cf.* Munn in Wells 1992: 171 (though note reservations by Foxhall *ibid*) on rural settlement in southern Argolid (Jameson, Runnels, van Andel 1994), 'Households are occupied for a generation...This suggests that in individual cases these houses in the countryside must be operating within the life-cycle of a family.' Also Keller in Wells 1992: 173 on life-cycle of fifth- to fourth-century BC rural sites at Karystos (Euboia). On the short period of occupation at the Vari house, Jones, Graham and Sackett 1973: 397. Compare Young 1956a: 128 on the packed earth between plaster and wall surface of the Red tower, which he took as evidence for a considerable period of occupation, although how this would be distinguished from two distinct periods of occupation, for example, is not made clear. The tower complexes in Chersonesos Taurike appear to have been occupied for longer (perhaps continuous) periods of occupation than rural sites in the Aegean. Dufková & Pečírka 1970: 139 comment on the life cycle of 'Farm Pechonkin 3' which spanned the fourth to second centuries BC; Saprykin 1994 argues for multiple construction and occupation phases at these sites from Late Classical to Late Roman periods. *cf.* Lohmann 1993a: 137 n.1061 who estimates the duration of occupation at a tower complex in Atene to 160 years from the late fifth-century. For general problems of isolating the remains of single generation households in agrarian societies, Smith 1992: 30.

[60] On this point I differ from the epistemology of Kosso 1995: 193 who, referring to a hypothetical Athenian 'farm' site, states, 'It is very likely that the ceramic material at the Attic farm site bears information on dates because of its resemblance to comparanda found at the Agora and dated with reference to the texts. The credibility of the farm site evidence depends in part on the textual evidence in the sense that refuting the latter would undermine the former.' Kosso appears to ignore any problematics of pre- and post- 'farm' ceramic deposition, as well as the re-use of sturdy pottery (e.g. Archaic/Classical storage vessels) in later contexts.

arranged in conflict with the discernible internal plan of a tower may also be a further indication of later phase usage.[61]

Epigraphy

In cases where evidence is available, epigraphy can help clarify site chronology, either through 'internal' dating of information contained in the inscription, or via approximate dating of letter forms. For example, an inscription (*IG* XII 8, 683) built into a tower on the Pyrgos cape of Thasos which dedicates the structure as a monument to Akeratos has been dated to the late Archaic period (late-sixth century BC).[62] Epigraphic material found at the Smovolon tower of Tenos dates to the late-third or early-second century BC, although there is some debate as to whether the inscription belongs to the original construction.[63] However, there are no examples of *in situ* epigraphy at Siphnian sites, and dating must rely on ceramic and masonry material.[64]

Ceramics

Ceramics at Siphnian sites include a distinctive cross-hatched style of *pithos* dated to the Archaic period (*Pl.18.2*).[65] This 'Siphnian' pottery may be found embedded in the masonry and internal-fill (**18**, **28**), with a preserved *pithos* occasionally situated in the ground-floor interior (**23**).[66] Ceramic wares (usually black glaze fineware or *amphora* handles) of the Classical and

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[61] Rural wall dating is notoriously difficult: Pečírka 1970: 466-7 on the problem of dating the walls and farms on Chersonesos due to incomplete excavation and ambivalent archaeological material. Some traces of fifth-century pottery were identified, but the majority of the pottery was of a Hellenistic date, with Pečírka favouring the latter date. Also Schaus & Spencer 1994: 414, 427-9; Whitelaw 1994: 166 for respective difficulties in dating rural walls on Lesbos and Keos.

[62] Ακηράτο ε[ι]μὶ μνῆμα τῶ Φ[ρασ]ιηρίδο
κεῖμαι δὲ ἐπ' [ά]κρο ναυσ[τ]ά[θ]|μο σωτήρ[ι]ον
νηυσίν τε κα[ὶ ν]αύτησιν. ἀλλὰ [χαίρετε[ε].
See Appendix 2.6 (The tower is best interpreted as a memorial, although the maritime content of the inscription and its location would not preclude its use as a naval marker). Osborne 1986: 168 n.7 rejects the late date of tower construction generally proposed by Lawrence 1979: 187-188, 197. Brunet 1988b: 76-7 also favours an Archaic date.

[63] Λυσίθε[ος] 'Αρισοτολόχ[ου] κατεσκεύα[σεν] (*IG* XII 5, 955); [Λυ]σίθεος 'Αρισοτολόχ[ου] (*IG* XII 5, 956). Weil 1877: 62 n.6 claims that the inscription was near the tower, but not part of its wall. However, see Maier 1959: 163-6. Étienne 1990: 33 sees Lysitheos as a magistrate, 'un militaire ou un épimélète des travaux', but this is due to his interpretation of Tenian towers as part of a Late Classical/Hellenistic 'defence system'. He appears unaware of recent epigraphy related to private ownership of towers (e.g. Langdon & Watrous 1977; Waelkens 1982) and scholarship concerning their functions. It is possible that it may have been private property (i.e. Lysitheos as builder and owner) or a private benefaction for public use.

[64] N.B. Boussac & Rougemont 1983: 117 question with regard to Amorgos whether towers there would have been dated differently if it had not been for (Hellenistic) epigraphic evidence.

[65] Dragatsis 1920: 55, 164. The 'Siphnian' pottery style, so named from the ceramic material excavated at Kastro (Brock & Mackworth Young 1949) has never been securely provenanced to the island (Butt 1977: 304). An Archaic (sixth-century BC) date is generally accepted, although an earlier seventh-century BC date may also be possible (Richard Catling, pers. comm.). Siphnian *pithoi* of this type have been found in the Athenian Agora (Sparkes & Talcott 1970 pl.65, 1506, 1508), and Keos (Sutton 1991: 256, 258 fig.11.13). For the 'Siphnian' style generally, Boardman & Hayes 1966: 73-76, 1973: 34-36; Butt 1977: 299-308.

[66] Ashton 1991: 82-83.

Hellenistic periods may be present in sherd scatters at sites (**6**, **15**, **19**, **23**, **24**, **25**, **28**, **30**, **37**, **38**, **44**, **51**, **52**, **53**, **54**, **55**), but at some towers the only pottery assemblages are un-diagnostic coarseware (**1**, **3**, **5**, **13**, **17**, **21**, **33**, **34**, **39**, **46**, **50**) while at other sites there is a paucity of ceramic wares (**9**, **10**, **22**, **41**, **42**, **43**, **49**). This is partly due to difficulties of visibility at some of these sites.

However, the problem of correlating non-stratified pottery to a specific date of site use, due to a lack of stratigraphy and the robustness and longevity of coarseware pottery (which may have been re-used over a considerable period of time in antiquity), means that they may be read only as general indicators of site activity.[67] Even relatively large and dense Archaic and Classical fineware and coarseware scatters in the vicinity of a tower site (e.g. **18**) do not rule out the possibility that they represent a phase of activity prior to the construction of a tower there.[68] Substantial, datable archaeological material, such as the large, Archaic basin with relief design adjacent to tower **23** (*Pl.23.3*), may have survived as a domestic heirloom for several generations (life-cycles) within a household.[69]

The broad weight of ceramic evidence therefore suggests a general Classical-Hellenistic date, but the nature of the evidence means that dating by this means can only be approximate.

Masonry

In the face of such problems when trying to establish a chronological link between ceramic assemblages and towers, attempts have been made to establish relative chronology from the styles of masonry employed in the cut blocks of external walls and entrances. Since the external walls of most Siphnian towers survive to a height of several courses (despite the problems of site destruction), remains are usually sufficient to identify masonry styles.[70]

As with ceramic evidence, however, this method may only date certain towers to relatively broad chronological periods.[71] Masonry styles may therefore be used with caution as a dating tool; however, they cannot be used to reconstruct a 'development sequence' of individual Siphnian towers. Such an attempt would be open to circularity: masonry might be dated to a certain sequence

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[67] Sutton 1991: 247-250, 256 on 'Siphnian' pottery.

[68] Ashton 1991: 72-73. Sherds are densely scattered (approx. 5+ sherds/m^2) around an area 100m^2 around tower **18** (personal observation, Nov. 1995).

[69] Sparkes & Talcott 1970 pl.65, 1513 for a parallel from the Athenian Agora. Some evidence of contemporary activity at sites is provided by storage of agricultural implements in towers (e.g. Konecny 1993 for stone presses at Lykian tower complexes). *Table 4.9* for stone presses at **11**, **22**, **29**, **48** (Isager & Sydsgaard 1992: 68 date the appearance of stone pressing beds not earlier than the late-fifth century BC), but implements are usually unstratified, and can only be dated approximately (Lohmann 1993a: 157 n.1168).

[70] See Appendix 1.2.

[71] Kallet-Marx 1989: 307. See also Scranton 1941: 12; Wycherley 1949: 46-47; Maier 1961: 93-99; Garlan 1968: 246-247; 1974: 15-16 for the ambiguities of dating walls on the grounds of masonry style.

in the 'chain' on the inference of other masonry which appeared 'contemporary'.[72] Instead, analysis of masonry styles can suggest a broad chronological indication of their construction date (although only 'patch-up' masonry can help indicate the subsequent 'life-cycle' of the structure).

Of the datable styles of masonry and chisel work, trapezoidal masonry may be recognised from fifth century BC onwards, and ashlar masonry from the late-fifth century, while bevelling techniques are considered to date only from the Hellenistic period (*Table 3.4*).[73] Isodomic arrangements of masonry courses at some towers bear comparison with the isodomic marble blocks of the akropolis walls on Kastro (where the lower edges of blocks on the south corner were drafted). The date of this section of akropolis wall is best attributed to the Late Classical period.[74] At some sites masonry style may have been influenced by type of stone, for example at **50**, where limestone was quarry faced and trapezoidal in shape, with marble broached and ashlar. The variety of masonry work found at certain towers, probably due to the presence of different masons, further illustrates the difficulties in attempting to date by style.[75]

In the light of these ambiguities, it is perhaps not surprising that the dating of towers has provoked considerable discussion and produced a wide variety of views. Dragatsis' dating system was idiosyncratic and ultimately inconsistent, ranging between dates from the Late Bronze Age to Medieval periods,[76] while Young preferred to leave the question of dating beyond implying a broadly Classical date. Ashton dated towers from the late Archaic to Hellenistic periods on the basis of sherd finds, masonry styles and entrance types (*Fig.3.5*). Ashton's dating system has, however, been challenged on historical grounds, namely the introduction of the arch as an architectural feature under Macedonian influence only from the late-fourth century BC.[77]

Six towers with arch-shape entrances have been identified (**11**, **14**, **18**, **20**, **27**, **48**) (*Pl.11.1-2; 14.1; 20.1-2; 27.2; 48.2*), although other towers whose entrances are now destroyed may have

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[72] Ashton 1991: 130-33 draws attention to the similarity of tool marks on the bevelled edges of towers **47** and **48** as a possible stylistic synchronism by the same mason. Other similarities can only be drawn from general architectural styles.

[73] Scranton 1941: 22-3, 160; Haselberger 1978a: 369; Lawrence 1983: 167-172. See Appendix 1.2 for masonry styles in individual Siphnian towers.

[74] Brock & Mackworth Young 1949: 2, pl.3.5 give a sixth-century BC date (after Herodotos III.57-58) while acknowledging that the use of drafted blocks would be unusual at such an early period, and is more likely dated to the Later Classical period (fourth century BC).

[75] Winter 1971: 83; Osborne 1992b: 46. *cf.* Appendix 2.2 for Hellenikon-Choreza square tower on Andros (Koutsoukou & Kanellopoulos 1990: 166). Trapezoidal isodomic, quarry-faced masonry received flat pointed finishes on upper and lower block faces with bevelled joints, and drafted edges on different blocks, perhaps corresponding to alternate courses built by different masons.

[76] *cf.* Dragatsis 1915, 1924.

[77] Boyd 1976: 92-98; 1978: 88; Haselberger 1983: 136-142, esp. 141; Preziosi 1994: 59-61.

POLYGONAL	**TRAPEZOIDAL**	**ASHLAR**
Irregular	*Irregular*	*Irregular*
	Pseudo-Isodomic	*Pseudo-Isodomic*
	Isodomic	*Isodomic*

TABLE 3.4: *Schematic Classification of the Styles of Greek Masonry after Scranton 1941: 23-24 with reference to masonry found in Siphnian towers.*

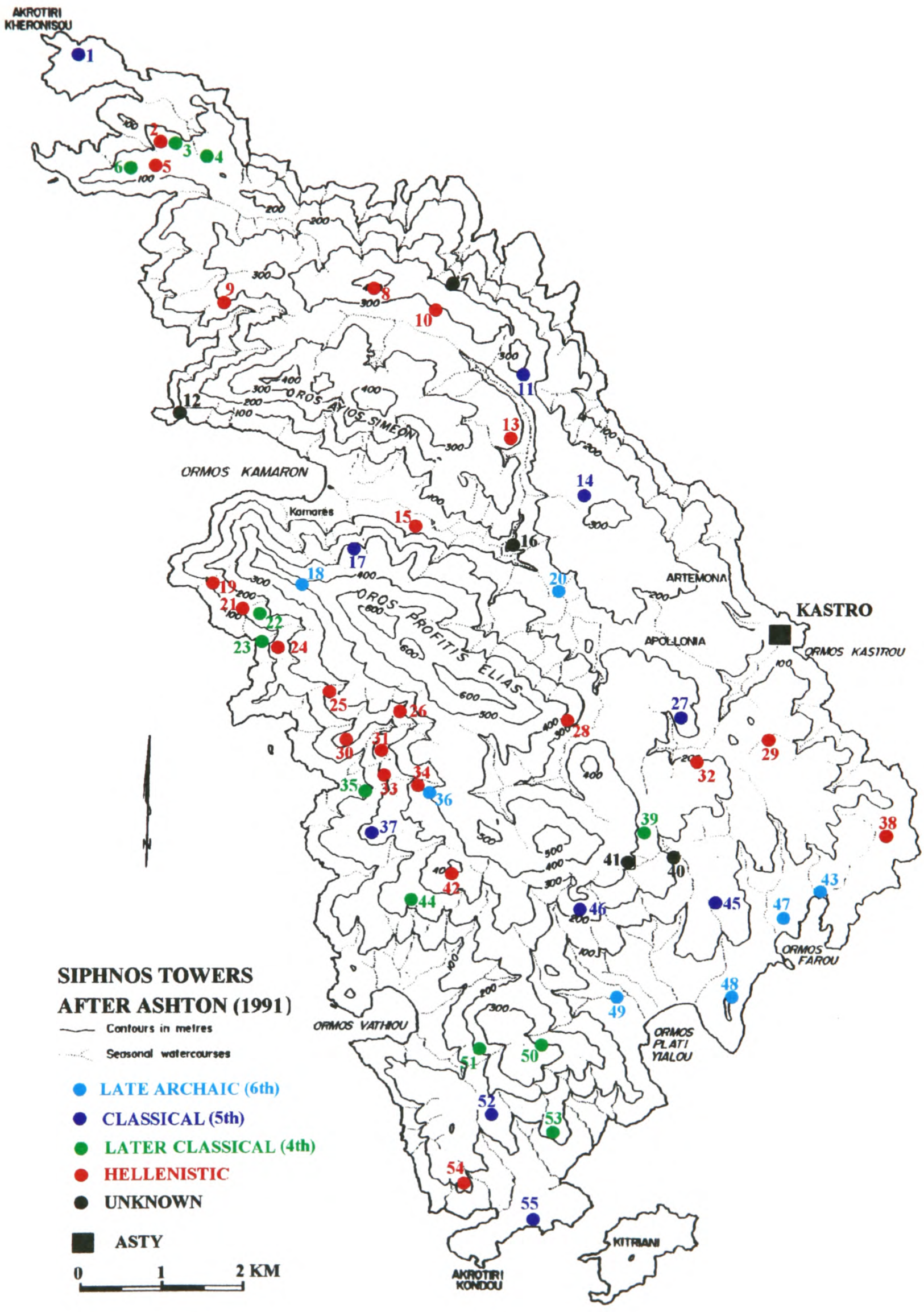

FIG. 3.5: *Map of Siphnos towers indicating approximate date of construction according to Ashton 1991.*

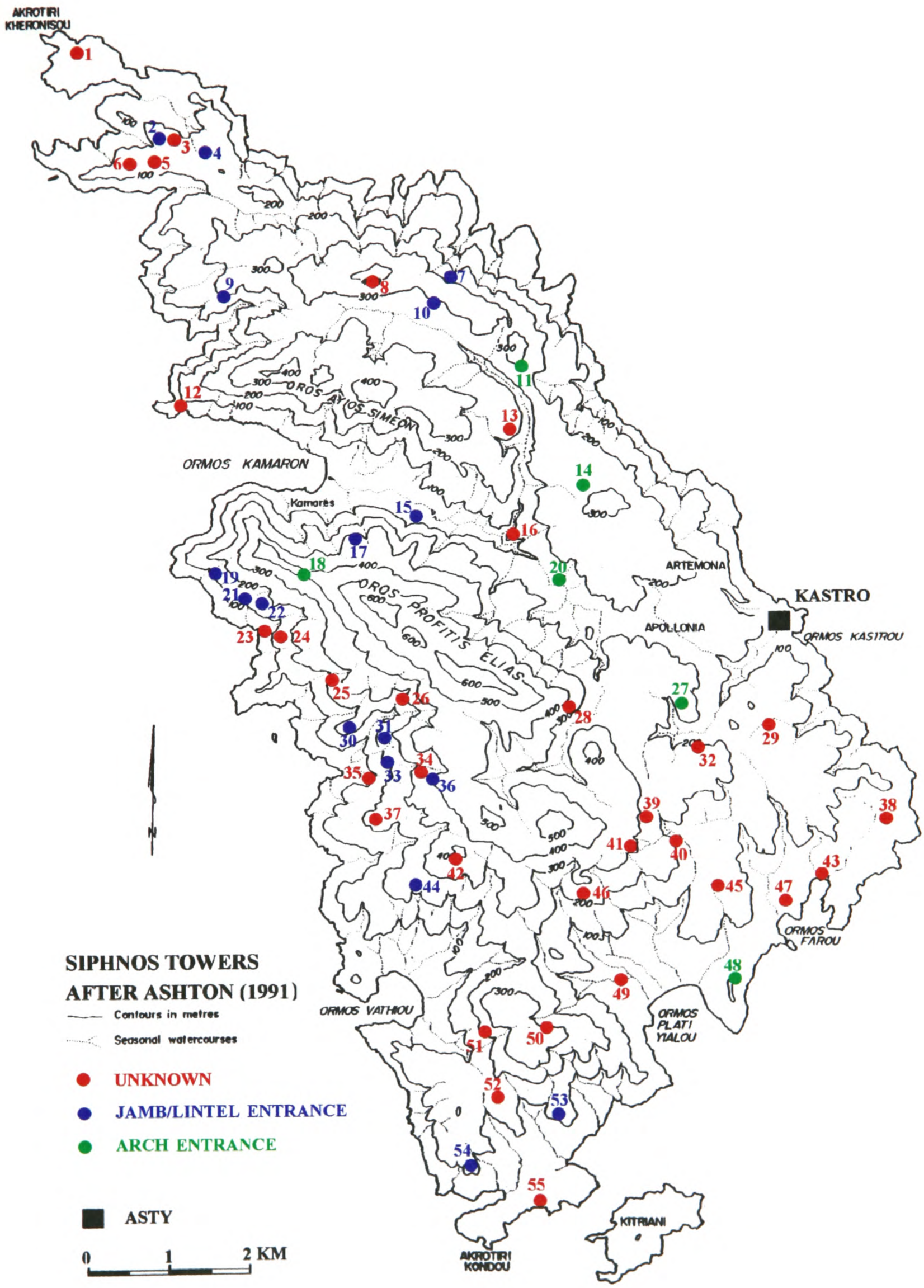

FIG.3.6: *Map of Siphnos towers indicating masonry style of entrance.*

possessed a similar style (*Fig.3.6*).[78] None were 'true' arches: the effect was created by chamfered grooves on carved springers with a keystone inserted in a corbelled span.[79] Ashton dated these 'arch' entrance towers to the Late Archaic or Classical periods, although a Hellenistic date seems preferable on architectural-historical grounds. The presence of bevelled margins on the masonry at towers **14**, **27**, **43**, **47**, **48**, **49** would also support a lower, Hellenistic date (*Pl.14.1; 47.1*).[80]

Other entrance styles are less diagnostic: a jamb and lintel arrangement is the most common entrance type (*Pl.4.1; 19.1-2*), although there is a degree of architectural variability between individual towers of this type. Some jambs, e.g. **44**, are notably thick, (*Pl.44.1*), and may even extend to a block type (e.g. **29**, **39**), or may be recessed from the external circumference (**31**).[81] The jamb-lintel style is consistent with a Classical-Hellenistic date, but further chronological specification based on jamb masonry style is not possible.[82]

Despite methodological problems in dating rural sites (which neither excavation nor survey have satisfactorily solved), the overall weight of ceramic and masonry evidence suggests an upper date of construction (for towers with jamb-lintel entrance and trapezoid masonry) in the later Classical period (fourth century BC) and a lower date of construction in the second century BC (at least for 'arch' entrance structures).[83] The inevitably approximate nature of dating Siphnian towers from available archaeological evidence means that the historical 'life-cycle' of individual towers is uncertain. However, the extensive range of architectural and locational information makes Siphnian rural sites eminently suitable for investigation of longer term landscape history which may explain the location, distribution and function of these sites.[84]

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[78] The entrance of **35** is not extant, but what appears to be the displaced lintel has a decorative chamfer similar to those found on arched towers. See Ashton 1991: 106-7.

[79] Haselberger 1978a: 361 fig.14; Ashton 1991: 76 photo 20A, 91 photo 27B. For 'true' and 'false' arches, see Boyd 1978: 90-93.

[80] Haselberger 1978a: 369-370; Haselberger 1983: 138-142.

[81] The threshold may also be recessed e.g. **5** (Ashton 1991: 46-7), although in this case the entrance type, whether jamb/lintel or 'arch', is unknown.

[82] For jamb entrances, and the problem of dating the architectural remains of such rural building complexes on Delos, see Brunet 1988b; 1989.

[83] Haselberger 1983: 142 attempts to date Aegean towers in general between early-fourth to first centuries BC. Cherry, Davis, Mantzourani 1991b: 291 date Keian towers from the late Archaic to early Hellenistic period. Spencer 1995c dates Lesbian masonry towers to the Archaic period, and isodomic masonry towers to the Hellenistic period on Lesbos. Dousougli & Morris 1994 follow Dörpfeld 1927: 256-262 in assigning a Late Classical-Hellenistic date to towers on Lefkas. Konecny 1993: 51 dates Lykian towers to the Hellenistic period on stylistic grounds of pseudo-isodomic masonry. Osborne 1986; Brunet 1988a; Kozelj & Wurch-Kozelj 1989 date Thasian towers between Archaic and Hellenistic periods. Hanson 1995 attempts to attribute these rural sites essentially to a pre-fourth century, Classical period of construction.

[84] Thus Snodgrass 1991b: 63, 67 on the opportunity of classical archaeology to contribute to the study of the *conjonctures* of Annaliste history, 'the man-made rural landscape is the embodiment of the *longue durée* and *moyenne durée* in action.' See pp.19-20 above.

FUNCTIONS OF MONUMENTAL RURAL SITES: HISTORICAL, EPIGRAPHIC, ETHNOGRAPHIC AND ARCHAEOLOGICAL EVIDENCE

The definition of functions associated with monumental rural sites, and the application of such hypotheses to archaeological material has been extensively debated, especially where written sources offer only a partial illumination on subjects such as specific uses of architectural forms, internal space and the relationship of the site to its locality. In addition to ancient written sources, ethnographic and archaeological comparison may also provide useful inferences about the roles of towers in the ancient countryside. The following discussion reviews problems of interpretation which will be considered with regard to the Siphnian data.[85]

Interpretations of stone built towers fall into two broad domains (*Table 3.5, Fig.3.7*).[86] In the 'public domain', towers might function as strategic, military structures (such as forts and watchtowers), communication structures (such as beacons and lighthouses), or administration centres (toll collection). In a private, domestic context, it has been argued that such structures might operate as residences or secure storage space for chattels (which in the public domain might be classified as a refuge facility).[87]

THE PUBLIC SPHERE

Forts, watchtowers and refuges

Early interpretations of monumental rural sites attributed a public, strategic function almost exclusively to such sites, in keeping with prevailing scholarly interests.[88] In narrative histories it was common to find towers fulfilling a public, military function,[89] in parallel with φρούρια ('forts')

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[85] Material relevant to the discussion below is found in Appendices 2-3, which contain comparative data from Aegean islands and other areas of the Mediterranean where rural towers have been recorded. Given the variability of information concerning the architecture of towers themselves, as well as any topographical data about associated structures and land use in the vicinity, coverage is inevitably inconsistent, e.g. only one of several towers on Skyros which were mentioned in passing (Friedrich 1906b), was described in any detail; Osborne 1986: 171 on the limited investigation of the landscape in the immediate vicinity of Thasian towers; Spencer 1993: 152 notes the absence of land use information concerning Argolid 'block-houses' and towers (Lord 1938; 1939; 1941); Thielemans 1994: 139 notes the lack of a consistent terminology, and variability of recorded information, in the study of Attic towers.

[86] e.g. Munn 1983: 15-62 reviews the functions of towers according to a typology of 'military' and 'farm' uses: the following discussion below illustrates how more sophisticated differentiation is required.

[87] Young 1956a: 131-143; Cherry, Davis, Mantzourani 1991b: 292-3.

[88] See above pp.13-14.

[89] On strategic importance, Thoukydides III.51 where two towers (δύο πύργω) on the island of Minoa or on the mainland of Nisaia (Thoukydides' wording is ambiguous), were captured by Nikias in his conquest of the island in 427 BC. The relationship of the passage to Megarian topography (Strabo IX.1.4; Pausanias I.44.4) is much discussed, in particular the location of the towers (see Gomme 1956: 333-6; Adcock 1947; Beattie 1960; Munn 1983: 82 n.122; Hornblower 1991: 441-2) but the strategic function of the edifices is not in doubt (*cf.* the more general φρούριον 'fort'

and φυλακαί ('watch-posts').[90] The tendency towards a public, military interpretation of many rural archaeological sites in much of modern literature is perhaps due to the definition of the English word 'tower', [91] and its association with the Greek word πύργος, which might be used in military terminology to describe a stone or wooden structure attached to city walls,[92] or a moveable siege engine.[93]

In archaeological terms this has traditionally been expressed in the general (and sometimes rather vague) category of 'watchtower' to include structures comprising several storeys of monumental stone masonry.[94] The application of such an undifferentiated category has been compounded by the uncritical interpretation of function on the basis of architecture alone, and insufficient consideration of location.[95] Indeed, one of the tallest preserved towers at Ayia Marina, Keos has a markedly restricted viewshed, located on the lower slopes of a valley (*Pl.I.70*).

Re-evaluations of the function of many rural sites have prompted more recent 'military' interpretations of stand-alone rural towers to seek more explicit substantive architectural evidence. One proposal, which depends on the restoration of upper storeys as catapult chambers, has argued that stone towers of notable height (usually 4 or 5 storeys) acted as artillery posts in border areas of *poleis* which were regularly disputed.[96] Such studies appear to have been pressed into service as

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of Boudoron on the headland of Salamis in Thoukydides II.93). The use of mountain watchtowers and pirate refuges in Spain is noted by Livy XXII.19.6.

[90] e.g. Thoukydides II.13.6, II.24.1.

[91] In the *OED* sense (I.1) 'A building lofty in proportion to the size of its base, either isolated, or forming part of a castle, church, or other edifice, or the walls of a town'. The second definition of 'tower' (I.2), 'A structure used as a stronghold, fortress or prison, or built primarily for purposes of defence', is too narrow in its range of meanings when applied to the Greek word πύργος or variants (e.g. diminutive πυργίδιον), as is discussed below in the chapter.

[92] Aristophanes *Birds* 1161-2. *IG* II^2.244 col.II.84 = Maier 1959 no.10.84 (Piraieus walls). *SIG*^{3} no.961 (Smyrna); *cf.* Aineias Tacticus: XXXIII.3 'ξύλινοι μόσυνες' (Whitehead 1990: 197). The archaeological and epigraphic evidence for round and quadrangular circuit towers is very substantial - for a general review see Winter 1971: 75-7, 175. Local surveys can be found in McNicoll 1972; 1997 (Asia Minor); Kienast 1978 (Samos); Ober 1987b (Attika and Boiotia).

[93] Aineias Tacticus: XXXII.2 (see Whitehead 1990: 193); Diodoros XIII.54.7. On literary usage of πύργος in a defensive sense, see Callimachus *Hymn to Delos* XI. 22-23, where Cycladic islands 'shelter all around with their ramparts'.

[94] Also suggested for structures of other periods, e.g. a tower overlooking the coast of north-west Keos (Cherry, Davis, Mantzourani 1991a: 60 fig.4.3, 72) and tentatively dated to the Turkish period. Possessing entrances at both ground and first-floor level, it possessed a small surface area (2m x 2m) and hence had only limited storage ability. See below n.113.

[95] This approach is evident in Adam 1982: 71-75 where stand-alone towers at Oinoi and Aegosthena in Attika, and 'block-houses' at Kephalari and Ligourio are described as watchtowers ('les tours de guet'), 'Ce type d'édifice éloigné des villes ou des places fortes, mais généralement en communication optique directe ou par relais, avec celles-ci, était destiné à assurer la surveillance des principales voies de passage, à prévenir la garnison ou la cité voisine d'une approche hostile et, dans une certaine mesure, à en retarder l'avance'. However, there is no discussion of how such structures would have functioned, nor any discussion of other possible functions.

[96] Ober 1987b (1992 for circuit wall towers) *contra* Lohmann 1992: 40; 1993: 138-9. In the Megarid, debate focuses on whether traces of ballistic activity can be inferred from the masonry in the upper courses of several towers

part of a wider debate concerning the changing nature of warfare and military strategy in the fourth-century BC *polis*, with particular reference to the countryside of Attika and the development of a strategic and communication system throughout the *chora*.[97] Several studies have concentrated on this role of towers as links in communication networks comparable to medieval *vigla*, day and night look-out posts situated on mountain slopes or peaks.[98]

Written evidence for more complex inter-communication systems of a military nature comes from a didactic treatise of Aineias Tacticus, generally attributed to the mid-fourth century BC, with a later review of Aineias's work and other strategists by Polybios, for whom it appears to have been something of a pet subject.[99] However, rural towers are not directly mentioned with regard to signalling. Persons referred to as watchmen (ἡμεροσκόποι) are to be stationed on heights in order to pass a visual signal (e.g. smoke, fire, shield glinting or rather more prosaically, shouting) in a chain to the *asty*, or to communicate, when an enemy is threatening at harvest time, the need to return to the *asty* at dusk.[100]

A tower is not a necessary pre-requisite for such a system, as a bonfire on a hilltop would function efficiently as a signalling device as well as allowing more flexible, less permanent positioning, and the term used by Aineas Tacticus anyway is a general one.[101] It would therefore appear unlikely *a priori* that those rural towers situated low down or with limited aspect to areas such as the coast would have been constructed for the sake of a communication system, nor where towers are situated in close proximity to one another in areas of good intervisibility.

It has also been argued that certain coastal towers may have functioned as pilot beacons or lighthouses,[102] although the extent to which such landmarks may also have operated as deterrents to

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(Tillyard 1905/6; Hammond 1954; Haselberger 1979; Ober 1987b), or whether the presence of a cistern, in addition to its situation in arable land, makes an agricultural function more probable (Lohmann 1992: 40).

[97] Garlan 1989: 119-121; Hanson 1995: 327-355 on fourth-century BC changes in aims and strategies, from short campaigning, hoplite warfare to long campaigning, siege warfare by mercenary troops (*cf.* Amyard 1959).

[98] Rackham & Moody 1996: 199 for *vigla*. Kallet-Marx 1989 on the Evangelistria tower in Boiotia; Camp 1991 on towers in the Attic-Boiotian border areas. The Dema tower has been interpreted as a command post (Jones, Sackett and Eliot 1957: 173), and, with the other round, solid-filled towers, part of a mountain top observation post system along the western frontiers of Attika (Munn 1993: 63). See Appendix 3.2.

[99] Aineias' exposition on fire signals was located in his lost work '*Preparations*' (Aineias Tacticus VII.4, 'ὡς δὲ δεῖ τοῦτο γίγνεσθαι καὶ ὡς αἴρειν τοὺς φρυκτούς, ἐν τῇ Παρασκευαστικῇ βίβλῳ πλειόνως εἴρηται'), which is likely to be the source of Polybios' *excursus* (Polybios X.43-47). See Munn 1983: 43-7; Whitehead 1990: 111-113. Oblique reference to fire signals in the countryside, Aineias Tacticus VI.7; XV.1. *cf.* Pliny *Natural History* II.181 on the (undated) 'piratical terrors' which prompted the organisation of fire warnings.

[100] Perhaps not unsurprising given Aineias' programmatic statement at VII.4 (see above n.99). See Aineias Tacticus VI.1 on the stationing of scouts at elevated points; VII.2 on dusk warnings. Also Polybios X.42.7-8, 43.3; Livy XXVIII.5.16-17 implying mountain-top chains of fire signals.

[101] Literary references to σκοπιαὶ collected and variety of meanings discussed in Munn 1983: 84 n.133.

[102] For πύργος as lighthouse, see Gow & Page 1965 Posidippos no.11; Strabo XVII.1.6, XVII.1.9 (*cf.* Strabo XIII.1.22 describing the use of a navigation tower to sail from Abydos to Sestos). Archaeological evidence and reconstruction of ancient lighthouses is collected in Thiersch 1909 (*cf.* Blackman 1982b: 207-8). Kahane & Kahane

unwanted naval traffic is unclear.[103] Indeed, the kind of physical threat posed by the activities of *leistai* may not have been dissimilar to the plundering tactics of 'formal' hoplite warfare,[104] and the need for security (of people and chattels) among a rural population finds support among literary and epigraphic testimony.[105] The real or perceived threat of enemy soldiers, freebooters (not always readily discernible from the former) or pirates, suggests that a tower might serve an important refuge function, either providing temporary shelter to a few people within the structure, or, according to Ormerod, 'more in the nature of a fort', with a surrounding courtyard offering protection to a greater number.[106]

Such a theory, connecting monumental rural construction in the later Classical and Hellenistic periods with piratical activity was popular among Rostovtzeff-influenced scholarship, which argued for a qualitative change, and quantitative increase in depradations experienced in the Aegean, with 'peripheral' Hellenes (Aetolian, Cretans) or barbarians (Tyrrhenians and Illyrians)

1971: 254 on landmarks for nautical orientation. For towers on the northern and southern capes of Aegina, see map in Furtwängler 1906 (and below Appendix 2.7). Osborne 1986 nos. 26, 27, 29 for Thasian towers interpreted as beacons (*cf.* Kozelj & Wurch-Kozelj 1989 and Appendix 2.6 below).

[103] *Iliad* XVIII.207-213 for the use of beacons as 'artificial lighting' for guards to spot incoming enemy ships at night. On the interpretation of several coastal towers as naval watchtowers and beacons, see Koutsoukou & Kanellopoulos 1990: 172-174 for Tokeli tower (Andros); Kozelj & Wurch-Kozelj 1989 for Fanari & Pyrgos towers (Osborne 1986 nos. 27, 29), and Evraikastro structure (Thasos); Keller 1985: 203, 210-11 on two Euboian towers (*cf.* the coastal beacons of Euboia mentioned in Euripides *Helen* 1126-7 and Polybios X.42.7). Tracy 1986 sees historical echoes from the Persian Wars in the use of fire beacons to announce the capture of Troy (Aeschylus *Agamemnon* 281-311). For more sinister uses of pyres as 'beacon-traps' luring ships, see Fågerström 1988: 147. Generally, see Ormerod 1924b: 43-44, 69-72.

[104] Ober 1985: 47-50; McKechnie 1989: 109-111. Thus Aristotle *Politics* 1256b 1 notes that people may combine two or more of his five categories of 'livelihood' (βίοι): nomadic, farming, plundering, fishing, hunting.

[105] Plutarch *Eumenes* VIII.5 on rural structures sheltering slaves and livestock, 'κατὰ τὴν χώραν ἐπαύλεις καὶ τετραπυργίας σωμάτων καὶ βοσκημάτων γεμούσας'. *cf. IG* II^2, 2776.117-8 for the *eschatia*, small tower (*pyrgidion*) and *tetrapurgia* (ἐσχατίᾶς πυρ̣γιδίου τετραπυργίας Ἀτηνῆσι) of an Atene estate in the second century A.D. 'Refuge tower' at Rhamnous cited in *SEG* 24, 154.84. For attempts to identify archaeological examples of τετραπυργίαι on the Halicarnassos peninsula, see Keil & Premerstein 1914: 102; Bean & Cook 1957: 91-92. On the occasional phenomenon of 'twin', adjacent towers see Lohmann 1993a: 139-41 site CH3B (Atene); McLeod 1960: 319-20 (Perama peninsula, Salamis); Jameson, Runnels, van Andel 1994: site B50 (southern Argolid) and Appendix 3.1 below. All recorded Siphnian towers appear to be single edifices.

[106] Ormerod 1924a, 1924b: 41-48. This assumption is recently evidenced by Pritchett 1991: 352-358, who organises his material on 'Towers in Rural Areas' as a sub-heading of 'Raids and Pirates'. The theory was no doubt popularised by contemporary accounts of travellers to the Mediterranean, e.g. Newton 1865: 79, 'Our small society has been enlivened by the visit of a French gentleman, M.L——, who resides at Maltepe, on the opposite coast, the ancient promontory of Cane, where he has brought a large estate for the cultivation of olives. He lives there with a large retinue of native servants, but cut off from all European society. His house is a *pyrgo*, with one large room on the first floor; the ground-floor being devoted to cattle and farming stock. The other day this gentleman had a visit from twenty-five pirates, who landed on a little island off the coast, where M. L—— has a quantity of sheep. He told his shepherd not to grudge them anything they might want, and they had the modesty to be content with thirty-five sheep ! M. L—— looked on the whole affair with great complacency, regarding the loss as a species of black mail, such as the Scotch Highlanders used to levy on the rich Lowlanders.'

DOMAIN	SUGGESTED FUNCTION	CRITERIA	SUGGESTED EXAMPLES	REFERENCE
PUBLIC	MILITARY			
	(artillery) Fort	strategic location (e.g. communication route); military architecture (e.g. weapon slits); artillery mechanism on upper storey	5 storey *propugnaculum* at Oreum on Euboia - Livy XXVIII.6.2	Ober 1987b
	Watchtower	*pyrgos* with wide viewshed (on slope, mountain-top etc.)	Boiotia/Attic towers	Ober 1985; Camp 1991
	Refuge	*pyrgos* (with large internal storage/habitation space), courtyard wall in rural area	Aegean island towers	Ormerod 1924a, 1924b: 41-48; Rostovtzeff 1953: 202
	Signal	platform base; wideviewshed; component in an intervisible network	platform towers on east coast of Thasos	Kozelj & Wurch-Kozelj 1989
	ADMINSTRATIVE	public building located at harbour/land border	toll collection	Aineias Tacitus XI.3
	MONUMENT	solid fill tower and flat platform top	cult/statue platform base (Apollo Proopsios, Mt. Hymettos ?)	Lohmann 1992: 40
	MONUMENT	*pyrgos* with dedicatory inscription	Tomb/memorial (Akeratos, Thasos)	*IG* XII, 8.683
PRIVATE	RESIDENCE			
	tower house	*pyrgos*; internal lock	Timon's residence in Attika	Pausanias I.30.4
	rural farmstead	*pyrgos, aule* (courtyard), *oikia* (house)	female slaves' quarters on Attic farm	[Dem.] XLVII
	STORAGE			
	domestic/agricultural equipment and produce	external lock; partitioned internal space (horizontal and vertical)	*pithon* (cellar); basement/upper floor grain storage	*pithon* (*IG* XII 5, 872.53); granary (*IG* I^2 76.10-12; II^2 1672.292); Burford 1993: 141
	lower case = subset			

TABLE 3.5: *Table summarising tower functions, criteria and examples.*

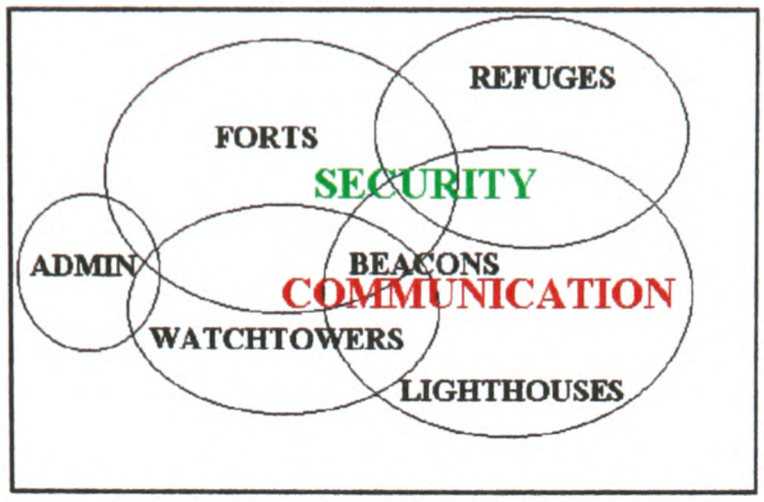

FIG. 3.7a: *Schematic diagram illustrating range of functions in 'public' domain of towers.*

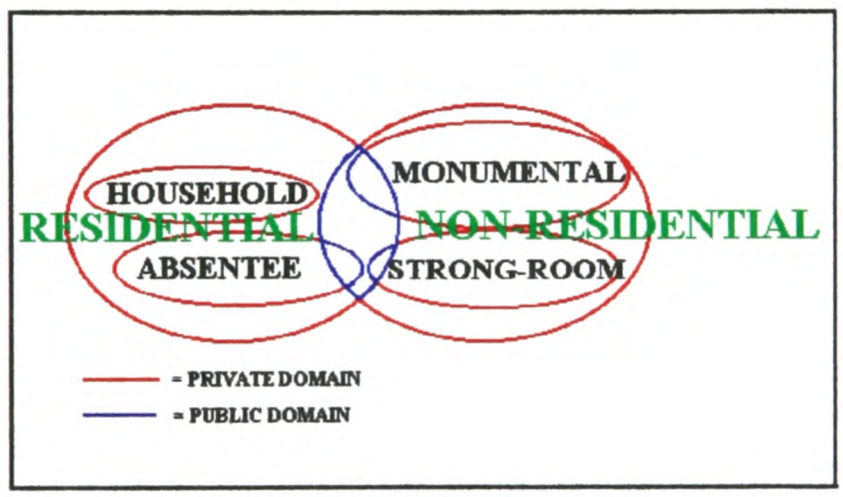

FIG.3.7b: *Schematic diagram illustrating range of functions in 'public' and 'private' domains.*

respectively held responsible.[107] However, it is clear that this view is over-determined by a moralistic attitude towards warfare and piracy, and underestimates its prevalence in the Archaic and Classical periods.[108]

Indeed, practical difficulties involved in identifying 'undesirables' at long range would reduce the effectiveness of any 'early-warning' system involving towers at the 'face-to-face' level of society.[109] In addition, the 'public' nature, and actual 'defensibility' of monumental rural sites deserves critical examination.[110] The case of Aglomakhos' tower, reported by Herodotos, serves as a cautionary tale,

> ἑτέρους δέ τινας τῶν Κυρηναίων ἐς πύργον μέγαν' Αγλωμάχου καταφυγόντας ἰδιωτικὸν ὕλην περινήσας' Αρκεσίλεως ἐνέπρησε.
> Herodotos IV.164
>
> 'Arkesileos burned alive some of the other Kyrenaians who fled into Aglomakhos' great tower, a private edifice, by piling wood around it.'

The need for the noun πύργον to be qualified with the adjective ἰδιωτκὸν ('private') suggests that the audience might need to distinguish it from other (public) edifices. Although we do not know whether Aglomakhos' tower was of stone, wooden or mud-brick construction, the story illustrates that structures could only offer limited protection to sustained attack, and that monumental construction may have been more decorative than necessarily functional.[111]

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[107] 'The Aegean was at the mercy of domestic pirates... 'Piracy had indeed been practised in Greece from time immemorial. But the frequency of the Hellenistic inscriptions that refer to it, though inscriptions of this period are comparatively rare, indicates that this ancient practice had now become very common and was carried on with cynical ruthlessness. There is further evidence of this in the fact that it was not till the fourth century that the Greek islands began to build watch-towers and refuge-towers to protect their *peaceful* population against *pirate* raids, and such activity is specially notable in the third century.' Rostovtzeff 1953: 196, 202 (my italics). Also Holleaux 1952: 124-145; Larsen 1968: 210-212 for Aetolian 'piracy'.

[108] Humphreys 1978 for the importance of such activities in Archaic and Classical Greece; also Garlan 1989: 173-201; de Souza 1995. Thus Davies 1984b: 286 *contra* Rostovtzeff, 'Implicit in such a sketch is a view of pirates and their landward counterparts in brigandage as evil and marginal predators on settled society. That view is unsatisfactory, not so much because it reflects too Manichean a morality...as because piracy was too pervasive, and too firmly interwoven in the fabric of Greek society to be dismissed as marginal.'

[109] So Haselberger 1978a: 365; Osborne 1986: 174; Cherry, Davis, Mantzourani 1991b: 293; Dousougli & Morris 1994: 218; Preziosi 1994: 69; Spencer 1995b: 30.

[110] Indeed, it might be argued that an isolated tower structure projected a more complex, and subtle series of architectural messages, by employing a public, military style and incorporating it into the domestic sphere. On the application of the circuit tower form to isolated towers, see Ober 1987b: 591. For comparative architecture between curtain walls and stand-alone 'signal' towers in the countryside, Krischen 1922: 23-48.

[111] On the fire resistant properties of stone towers in comparison to other rural structures, Hanson 1983: 58-63. See also the story told by the medieval Serbian chronicler Daniel, where monks were forced to take refuge from Catalan pirates in a tower (πυφγος) within the courtyard of their monastery on Mt. Athos as it was burned (Soloviev 1933: 223-224; Lock 1986: 106 n.17). The tower usually operated as a store-room.

Consideration of such a hypothesis in regard to specific archaeological sites requires careful study of internal architectural space within towers to evalue the potential storage and habitation space available,[112] together with analysis of site distribution (especially if several monumental structures are located in close proximity).[113]

Other suggested functions

One other 'public' function associated with towers is that of administration (e.g. collections of tithes, tolls, harbour dues), a function of bay towers attested in Aineias Tacticus XI.3.[114] An official, public role of this kind has been associated with the tower at Cape Zoster near Vouliagmeni in Attika and a similar function is consistent with the position of at least one tower on Siphnos (**43**).[115] However, this is probably best seen as a 'minority' function when evaluating the overall archaeological record.

Conclusion

Given the implicit bias of much traditional scholarship towards the attribution of functions within a broadly 'public' category — 'watchtowers', 'signal beacons', 'refuges' or 'administrative' posts — more recent scholarship has been correct in questioning the evidence on which such assertions were made, and directing attention towards the (often neglected) private, domestic sphere.[116]

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[112] See below Ch.4. Nowicka 1975: 34 n. 73 cites a large tower (16 x 12.3m, 22.5m in height, wall width ~0.8m) at Olba in Cilicia located by a *temenos* and dated to the Hellenistic period, which may have played a formal role as a refuge. An inscription to Domitian (*SEG* 6.672: ἀσύλω τὸν πύργον) marked its reconstruction and dedication to Artemis Pergaia at the end of the first century AD. However, the notion of ἀσυλία is surely on the level of the individual supplicant and is closely linked to cultic and symbolic aspects of the tower's location: formal association with group shelter from hostile forces is not implied (*cf.* Woodward 1932: 9-11).

[113] Woodhouse 1897: 153-161 and Lawrence 1979: 178 cited the towers of Aetolia as examples of refuges, but given their small size, Munn 1983: 75-76 n.94 is probably correct in rejecting this interpretation in favour of a domestic, agrarian context.

[114] Fourth-century BC Chios possessed a (public) tower where officials had their quarters, adjoining a *stoa* by the shipsheds (Aineias Tacticus XI.3-4). The tower was the target of attacking forces who used ladders to scale the wall. For Venetian towers as administrative posts in bays and harbours see Thiriet 1958 no.371; Lock 1986: 107 n.26, 108-111. *cf.* Lawrence 1964: 110 on medieval towers in Central Italy.

[115] On Cape Zoster tower see Stavropoullos 1938: 6-7 (tower as fort); Eliot 1962: 32 n.25 (stamped lead weights in lowest stratum suggesting administrative role); discussion in Munn 1983: 80 n.111. Administrative roles for some inland towers and 'forts' generally viewed in the negative by Munn 1983: 86-7 n.149; Ober 1985: 155-7, 200. Towers in Piraieus were positioned for blocking maritime passage if necessary, but might also have fulfilled an administrative role (Thoukydides VIII.90.4; Garland 1987: 182-3).

[116] Young 1956a: 143 n.62. *cf.* Lock 1986: 104-109, 1989, 1996; Langdon 1995: 497 for the domestic context of medieval, mortared towers in Greece.

THE PRIVATE SPHERE

Monuments

Monuments, such as tombs or platform bases connected with cultic activity, strictly bridge the typological division between 'public' and 'private' domains, since it is arguable that some towers may have enjoyed either status, depending on the source of funding for their construction.[117] However, the only surviving ancient evidence which clearly suggests a sepulchral or cultic function belongs to Timon the misanthrope's tower residence (Pausanias I.30.4), supposedly used as his mausoleum (Lucian *Timon* 42), although the circumstances of the story ought to suggest the relative rarity of this function.[118]

Some have claimed that solid-filled mountain-top towers may in fact be monumental platform bases for the display of statues, rather than signal (fire) platforms.[119] However, this function does not appear applicable to hollow interior towers, although their undoubted prominence in the ancient landscape might make them suitable boundary markers, even if this might only be a secondary function.[120]

Residences

Recent studies of rural sites, which have accorded more weight of interpretation to residential aspects of household organisation, have favoured re-interpretation of many tower sites as *Turmgehöfte* ('farm-towers'), part of rural farmsteads,[121]

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[117] The memorial (μνῆμα) to Akeratos does not state whether the tower was set up at public or private expense.

[118] Lucian *Timon* 42, 'αὐτὸς δὲ ἤδη πᾶσαν πριάμενος τὴν ἐσχατιάν, πυργίον οἰκοδομησάμενος ὑπὲρ τοῦ θησαυροῦ μόνῳ ἐμοὶ ἱκανὸν ἐνδιαιτᾶσθαι, τὸν αὐτὸν καὶ τάφον ἀποθανὼν ἕξειν μοὶ δοκω'. Fracchia 1985: 688 rejects the sepulchral role which has been ascribed to Peloponnesian 'block-house' pyramids in favour of an agricultural function (*cf.* Opperman 1972) , due to the architectural and material evidence for human occupation.

[119] Tower platforms on Hymettos tentatively linked to the cult of Look-Out (Προόψιος) Apollo (Munn 1983: 89 n.168; Lohmann 1992: 40 n.35; *cf.* Parker 1996: 29 n.2). *cf.* Pouilloux 1947-8: 262 no.1 for Hellenistic inscription from Thasos listing tower, exedra and statue dedicated to the gods by Herakleodoros, a *proxenos* from Olynthos.

[120] Euphrantas tower (πύργος ὅριον) appears as a boundary marker (Strabo XVII.3.20), although its liminal placing may have meant that it became a convenient territorial marker only in later times. *cf. IG* XIV 352, II.35 which refers to 'the marker on the tower' (ἐς τὸν τέ(ρμονα) τὸν ἐν τῷ πύργῳ) in the boundary demarcation of a property (κλάρος). Likewise *SEG* XXVI.227 (Langdon & Watrous 1977: 166 no.2), a rock-cut inscription by the Cliff Tower, Soumion where the tower is used as a directional marker ([ἐδαφος] πρὸς τὸν πύργ[ο]ν). *cf. SEG* XII.100 (= Lalonde, Langdon & Walbank 1991 **P5**) lines 74-5 on the tower and house (πύργος κ|αὶ οικία) used as a boundary marker in a *poletai* lease. Bousquet 1965: 666, 676 suggests that the mountain boundaries (ὅρια) and watch-posts (σκοπιαι) on the frontiers of Hellenistic Myania and Hypnia were watchtowers, although without further specification they are just as likely to have been natural points of vantage (Munn 1983: 85 n.133). *cf. SIG*^{3} 527.50-55 and the οὐρεια (mountain-posts) of the Drerians on Crete.

[121] e.g. Pečírka 1973; Kreeb 1983 on *Turmgehöfte*; Munn 1982: 278; 1983: 15-93 who divides a typology of Attic rural sites between 'military towers' and 'farm towers'.

> 'The opinion of some scholars that these were military farm-buildings is contradicted by the material found....The tower, which was a constant and prominent feature of all the farmhouses, served...as a watchtower, and, if needed, as a defence against attack.'
> Pečírka 1970: 475

Residence within a tower (albeit for dependent female members of the *oikos*) can be glimpsed in [Dem.] XLVII. The land (χωρίον/ἀγρός) of the plaintiff, which lay near the hippodrome and was inhabited by his household, with several neighbours and a road nearby, possessed a house (οἰκια), a garden (κῆπος) with a gate (θύρα), a courtyard (αυλη) and a tower (πύργος). The two alleged intruders, Euergos and Mnesiboulos, were unable to gain access to the tower,

> αἱ μὲν ἄλλαι θεράπαιναι ἐν τῷ πύργῳ γὰρ ἦσαν οὗπερ διαιτῶνται ὡς ἤκουσαν κραυγῆς, κλείουσι τὸν πύργον, καὶ ἐνταῦθα μὲν οὐκ εἰσῆλθον, τὰ δ' ἐκ τῆς ἄλλης οἰκίας ἐξέφερον σκεύη
> [Dem.] XLVII.56
>
> 'For the other female domestic slaves were in the tower, where they dwell, when they heard a racket, and locked the tower. The men could not enter there and took the belongings out from the rest of the house.'

The tower also appeared to operate as a stronghold for moveable property as well as for people. Firstly the plaintiff contrasts the success with which the intruders carried off property from the rest of the house (ἐκ τῆς ἄλλης οἰκίας), and then alleges that Euergos and others returned to take more property (σκεύη) which had been in the tower the previous day but had now been moved outside, presumably into the garden or courtyard area since Euergos once more broke the gate down to obtain the property,

> ὁ δ' Εὔεργος οὑτοσὶ εὐθὺς ἐκ τῆς πόλεως μεθ' ἑτέρων ὁμοίων αὐτῷ ἐλθὼν εἰς ἀγρόν, τὰ ὑπόλοιπα σκεύη, εἴ τινα τῇ προτεραίᾳ ἐν τῷ πύργῳ ἦν καὶ οὐκ ἔτυχεν ἔξω ὄντα, ἐπειδὴ δ' ἐγὼ ἦλθον, διὰ τὴν χρείαν κατηνέχθη, ἐκβαλὼν τὴν θύραν ἥνπερ καὶ τῇ προτεραίᾳ ἐξέβαλον κακῶς ἐνεστηκυῖαν, ᾤχετό μου λαβὼν τὰ σκεύη.
> [Dem.] XLVII.63
>
> Euergos, this man here, immediately went from the city with these same other men with him to the farm. The remaining equipment, which had been inside the tower the previous day and did not happen to be outside, had been brought down for use. When I came, Euergos had wrenched out the gate which he had wrenched out the previous day and which was now standing precariously, had taken my things and was gone.

However, there is no direct reference to the use of towers as *dwellings* for free members of an *oikos*: an *oikia* and *aule* were also crucial residential features for the household.[122] Comparative

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[122] The tower belonging to Timotheos, Konon's son (Aristophanes *Wealth* 180) is interpreted by Davies 1971: 509 as part of the Long Walls, illustrating private munificence in a highly public context. Nowicka 1975: 62 n.4 viewed it as a private monument, Munn 1983: 30 as a rural residential structure on the reference to Timotheos' land

evidence may be sought in the 'non-military', and secular character of rural tower complexes noted in the iconography of Hellenistic and Roman wall paintings,[123] and usually interpreted as visualisations of working farmhouses in a rural context.[124] Towers rarely stand alone, but adjoin large complexes of buildings.[125] Nor do the Archaic models of towers from the Samian Heraion demonstrably represent dwellings.[126]

Exactly what constitutes sound archaeological evidence for permanent habitation at rural sites in general,[127] and at stone tower sites in particular (where any contemporary wooden structures would now be invisible) is much debated, especially the extent to which architectural features constitute evidence of permanent habitation.[128] Where organised water collection systems were constructed, such as ground-floor cisterns, water conduits and spouts, it would appear reasonable to infer some degree of regular habitation.[129] However, it might be argued that intensive seasonal activity involving a large work-force would also require a substantial storage system. The presence of upper storey windows (often south facing) is one feature among some of the best preserved and most elaborate towers which suggests a residential function.[130] However, it is clear that this is not a universal feature of tower architecture.

The small quantity of pottery recovered from excavation at several tower sites, and the absence of domestic wares in assemblages should caution us against the automatic assumption that towers

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in [Dem.] XLIX.11. In any debate concerning residence and monumentality, the importance of the reference is the clearly private nature of its funding.

[123] Grimal 1939: 42; Ling 1977: 8.

[124] Grimal 1928: 29; Frayn 1984: 91, on the 'large, towered farms of North Africa' represented in Roman mosaics, indicating pastoral activity. *viz.* Leach 1988: 265 n.13, 'we cannot be certain that the formulaic structures of the painters correspond exactly to contemporary reality.'

[125] Leach 1988: 265.

[126] Schattner 1990: 113-116 on so called 'tower houses'.

[127] Carter 1990: 408 argues that a high percentage of black-glazed fineware pottery among domestic wares proves permanent habitation at farm sites in the *chora* of Metapontum. Bintliff & Snodgrass 1985: 139 favour roof-tiles as diagnostic *indicia*, 'To the important question whether or not our "sites" represent permanent structures or centres of habitation at all, we can at least give a confident answer. The invariable discovery, on all our Archaic to early Hellenistic sites, of terracotta roof-tiles can only mean that these sites contained buildings of durable construction in stone, brick, or timber.'

[128] Pečírka 1973: 128, 'Thus the tower, as a relatively strong and therefore durable building, can help us to find the ancient farm, as can wells and cisterns, threshing floors, oil mills and wine presses.' See Lohmann 1992; Osborne 1992a with comments of P. Halstead in Wells 1992: 59. Rural complexes interpreted as farms on Delos (Brunet 1988a; 1988b; 1989), Karystos (Keller & Wallace 1988), southern Attika (Watrous 1982). Problems of identifying permanent settlement (or otherwise) at rural sites in van Andel & Runnels 1987: 158-9, Snodgrass 1987: 116-119. Osborne 1985b: 121, 127 argues from *IG* XII 5, 872 that οἰκία does not necessarily translate as 'house' and that only κλίσιον may refer to a farm dwelling (moderated by Étienne 1990: 26 n.56).

[129] Haselberger 1978a: 367; 1983: 97 on conduits built into the upper floors of the Ayia Marina tower (Keos).

[130] e.g. Haselberger 1983: 121-2 for upper windows in Ayios Petros (Andros), Ayia Marina (Keos), Kheimarrou (Naxos).

situated in arable, or even marginal land, were domestic residences.[131] Vessels suitable for the storage of domestic produce (*pithoi*), and structural material for habitation (such as roof-tiles, walls and buildings) have been found at towers, but they cannot be used as a universal indicator of farmstead sites since intermittent occupation (and hence storage activity) would leave similar archaeological traces.[132] Problems of evidence also raise questions about the *type* of any occupation: ownership might not necessarily equate with permanent habitation by the owner at the site.[133] We know of at least one case where a bailiff (ἐπίτροπος) supervised a tower complex for an absentee landlord (a scenario which must be given due consideration in the majority of cases where epigraphic evidence is lacking).[134]

Storages and seasonal centres

Thus, a tower *per se* (without accompanying evidence of other associated structures such as a courtyards and domestic buildings) is not diagnostic of permanent, 'farmstead' habitation by members of an *oikos*, and architectural analysis must be integrated within a wider 'archaeology of site'.[135] This is also applicable to those *pyrgoi* which appear to stand-alone, since the choice of interpretation is not simply a dichotomy between a public, military function and one of permanent residence, just as there are a range of words (πύργος, βάρις, ἔπαυλις, τετραπυργία, τύρσις) which in certain contexts may have meant a secure rural structure.[136]

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[131] See above n.58.

[132] Isager & Skydsgaard 1992: 68; Osborne 1996b: 167, 'Tying the changing pattern of material deposition in the landscape to changing social, economic or political conditions demands that the patterns of material deposition be interpreted. Much attention has been paid by survey archaeologists to the interpretation of small sites. After an initial enthusiasm for labelling all small sites farms, scholars have become more sensitive to the difficulty of knowing whether an agricultural building was or was not in residential use.' Koutsoukou & Kanellopoulos 1990: 159 argue for permanence of occupation at the Tsouka tower (Andros), on the basis of household and kitchen ware pottery remains found in and around the site, which was situated many kilometres from ancient urban settlement.

[133] Burford 1993: 56-58. As Munn 1983: 73 n.8 notes, the historical cases of Asidates and Timotheos do not prove *permanent* habitation of tower complexes (see above n.122). For towers on estates, *SEG* 24.46.3 = *IG* I^3 430c.3 ('πύργος ἐγ Κολοναῖς') belonging to one of the Hermokopidai (Meritt 1967: 85, Holloway 1966: 84). Strabo's comment (III.4.13) on Poseidonios' criticism of Polybios — namely that Polybios exaggerated Tiberius Gracchus' destruction of Keltiberic towers (πύργοι) by calling them cities (πόλεις) — might suggest that by early Roman Imperial times the word could be used to denote an order of settlement, although the criticism would ring harsher if the πύργοι were taken to mean specifically military structures rather than settlements.

[134] *SEG* 26.227 at Cliff tower, Attika (*cf.* Xenophon *Oeconomicus* XII.2). Foxhall 1990: 109 suggests that well-built rural sites with poor pottery may suggest tenant-run activity, although she acknowledges that a slave-bailiff arrangement would produce much the same archaeological pattern. *cf.* Audring 1973 for discussion of the social status of the *epitropos*.

[135] The problem is summarised by S. Morris in Wells 1992: 59, 'It [a tower] is an architectural feature, it is not necessarily an agricultural feature. They are found in farmhouses but a tower does not necessarily indicate a farm.'

[136] For πύργος, Preisigke 1919: 424-5; Hasebroek 1922: 621. See now Young 1956a: 138; Avram & Nistor 1982: 368-73; Munn 1983: 33 n.73; Osborne 1985b: 121; Yoshiyuki 1993: 2. For τύρσις and related words see Rostovtzeff 1923: 374 e.g. τύρσινοδος attested on Amorgos (*IG* XII 7, 115.4); for βάρις Rostovtzeff 1953: 508. On κλίσιον (*Odyssey* XXIV.208-210) as a possible synonym for πύργος meaning a 'lock-up', see Dousougli & Morris 1994: 218. However, it is worth noting that Achilles' wooden hut at Troy is a κλίσια (*Iliad* XXIV.448) and that κλίσιον may derive from κλίνω as 'a place to lie down' rather than κλείω 'to shut' (see pp.143-144 below for discussion of the

Evidence for the interpretation of towers as partibly owned, rural storage units which may, or may not be associated with habitation (*Table 3.5*), appears in an epigraphic document from Tenos as part of recorded transactions involving landed property.[137]

ʾ Ανθεστηριῶνος ὀγδόει ἱσταμένου χ ʾ Αρ[τ]εμισιῶνος Τελεσικλῆς
Ε[ὐ]κλέους ʿ Η ρα[κλειδῶν παρ]ὰ Ὀρθέος Ὀρθιαδος ἐκ πό[λεως]
ἐπ[ριάτο] τὰς οἰκιάς καὶ τοῦ πύργου τὸ τέ[ταρτομ] μέρος καὶ τὰ
χωρία τὰ ἐν Ἰακίνθῳ πάντα ὅσα τε ἐπρίατο Ὀρθεὺς παρὰ
Πολυκράτους τοῦ Ἐ[πικρά]τους οἷς γείτονες Πλε[ίσταρχος, Αρτύ
[μ]αχ[ο]ς δραχμ[ῶ]ν ἀργυρίου δισχιλίων τετρα[κοσίων]. Αρτύμαχος
Αριστάρχου ʿ Ηρακλειδῶν παρὰ Τε[λ]εσικλέους Εὐκλέους
ʿ Ηρακλείδου ἐπρίατ[ο τὰ]ς οἰκίας καὶ τὰ χωρία τὰ ἐν [Ιακίνθωι? πάν]
τα ὅσα τ'ἐλαχεν Τελεσικλῆς πατρῴων [μέρ]ος καὶ ἃ προσεπρίατο
παρὰ Καλλιτέλους τοῦ ἀδελφοῦ οἷς γείτονες Πλείσταρχος
Αρτόμαχος κα[ὶ τ]ὰς ἐσχατ[ι]ὰς πάσας ὅσαι ἦσαν [Τελεσι]
κλέους [κ]αὶ Καλλιτέλ[ους] καὶ ὕδατος ἀγωγὰς ὅσαι εἰσὶν τῶν
[χω]ρίων τούτων καὶ τοῦ πύργου καὶ τοῦ πιθῶνος τοῦ ἐν τῷ πύ[ρ]γ[ῳ
κ]αὶ τοῦ κεράμο[υ τῆς στέγ]ης τὸ τέταρτομ μερός καθὰ [ἦσαν Τε]
λεσικλέους καὶ τὴν οἰκίαν καὶ τὸμ κῆπον ἃ ἐπρίατ[ο] Τελεσικλῆς
παρ' Εὐθυγένους καὶ τὸν κέραμον τὸν ἐν ταῖς οἰκίαις καὶ ὄν[ον]
ἀλέτην καὶ ὄλμ[ίσκον] δράχ<μ>ῶν ἀργυρίου τρισχιλίων ἑπτ[α]
κοσίων, πρατῆρες Αρατ[ί]δης Τύχωνος Θεστιάδης, Αρτύμαχος
Εὐκλέους ʿ Ηρακλείδης, ...αρχος Τιμηφένους [Ιακιν]θε[ύς],
Εὐθυ[γέ]νης Αρισταρχ[ος .....]ους ʿ Ηρακλεῖδαι, καὶ μέσῳ πάντε[ς]
καὶ χωρὶς ἕκαστος.
IG XII 5, 872. 48-55

On the eighth day from the beginning of Anthesterion and Artemision, Telesikles, son of Eukles of Herakleidai, bought from Ortheus the son of Orthiades from the city, the houses and the quarter part of the tower and all the fields in Hyakinthos which Ortheus bought from Polykrates the son of Epikrates whose neighbours were Pleistarkhos and Artymakhos for 2,400 drachmas of silver. Artymakhos, son of Aristarkhos of Herakleidai, bought from Telesikles, son of Eukles of Herakleidai, the houses and the fields in Hyakinthos - all of them which formed part of Telesikles' inheritance from his father and what he bought from Kalliteles his brother, whose neighbours were Pleistarkhos and Artomakhos - and all the upland areas which belonged to Telesikles and Kalliteles.

Also all these fields' water-courses, a quarter part of the tower and the storage room which is in the tower and the roof tiling belonging to Telesikles, and the house and the garden which Telesikles bought from Euthygenes and the roof-tiling which is on the houses and the grinding millstone and mortar stone for 3,700 drachmas of silver. The guarantors all liable individually and jointly are Aratides, son of Tykhon of Thestiadai, Artymakhos, son of Eukles of Herakleidai ...arkhos son of Timephenes of Hyakinthos, Euthygenes, Artistarkhos...of Herakleidai are duty bound all together and each for all.

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archaeological evidence for locks). ἐπαυλις and its derivations have both a military ('camp') and domestic sense ('rural building') respectively.

[137] Finley 1952: 226 n.21 on 'the complex network of transactions hidden behind the facade of sales in this so-called register of land sales'. Also Pringsheim 1950: 116; Fine 1951: 160 n.48 for discussion of legal terminology. Most recent emendation, discussion, dating (late-fourth century BC) and bibliography of this inscription in Étienne 1985a; 1985b; 1990: 52-84. On property ownership in the *polis* generally, Finley 1952: 88-117.

The inscription is important evidence for multiple division and ownership of rural structures (inherited and alienated) which might act as storages.[138] How, in Finley's term, 'fractional' ownership operated, is not clear, and commentators have preferred to leave the problem in rather vague terms of a legal, but not physical, division of property.[139] The inscription refers to physical internal partition of the same tower into which Artymakhos is buying - a πιθῶν 'cellar' as well as a tiled roof (τοῦ κεράμο[υ τῆς στέγ]ης).[140] Buildings, courtyards and other kind of property might also be held under fractional ownership,[141] and the use of μερός in the terminology of the sales, for example the division a tower into quarter parts (τέταρτομ μερός - lines 49, 52) suggests more than just an abstract notion of a 'share'.[142]

Urban and rural contexts

Nor were such monumental structures solely a feature of the rural landscape: they also appear as a feature of ancient village architecture,[143] not only in Attic deme centres such as Halai Aixonides, Rhamnous and Thorikos, but elsewhere in the Mediterranean, most likely forming the strong-room of an adjacent dwelling (*Fig.3.8*).[144] A tower might also occupy a prominent position on a roadside leading from a village, as on Tenos, where it might be used as a local landmark (in this case perhaps significantly situated on the boundary of land considered *eschatiai*).[145]

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[138] e.g. *IG* XII 5, 872.60-2 where half of all property, including a tower, is purchased on behalf of a minor from Kleothea, the daughter of Kleotheos. Newton 1883: 147 on the connection between these sales and dowry portions, which (line 1) followed in the lost section of the inscription. Étienne 1990: 75-84 for Tenian prosopography and 'family' trees of buyers, sellers, guardians and guarantors.

[139] e.g. Finley 1952: 71, 'The question need not detain us.' Also Finley 1952: 260 n.114.

[140] Osborne 1986: 174; 1987: 72 on πιθῶν. The purchase of roof tiling suggests that Artymakhos may have owned an upper portion of the structure, as well as the storage room below.

[141] Weiß 1908 for collection of papyrological references to fractional ownership. Harrison 1968: 243 for epigraphical evidence, especially *IG* XII 5, 872. Harrison includes watercourses among the property under fractional ownership in the Tenian land register (*IG* XII 5, 872.52), although the wording suggests that, in contrast to the quarter share of the tower propery, all watercourses were included (ὑδατος ἀγωγὰς ὅσαι εἰσὶν τῶν [χω]ρίων τούτων).

[142] Weiß 1908: 331 n.2. On archaeological evidence for the internal partition of towers, see below p.138f.

[143] Jameson 1990b: 101, 103 sees it as a 'rustic' flavour in an urban context.

[144] For towers in Attic village (deme) sites: Halai Aixonides (Ano Voula), Lauter 1993: 29-43; Andreou 1994; Rhamnous, *PAE* 1991: 2 fig.1; Thorikos, Spitaels 1978; Kyparissi, Van de Maele 1986, 1987, Lohmann 1993a: 129-133. Jameson, Runnels, van Andel 1994: 550 fig. A.31 on the circular tower situated at Thermisi village in the southern Argolid. Tower at the village (κώμη) Kardakon, Lykia in Maier 1959: no.76.17-18, 'ἐπισκευάσα[ι]|δὲ καὶ τὸ προυπάρχον αὐτοῖς πυργίον'. *P.Tebt.* I.47.13-17, a second-century BC petition which reports a raid upon an Egyptian village house. McKechnie 1989: 110 notes that while the other doors of the village house could be 'stoved in' (συντρίψαντας τὴν παρόδιον θύραν), the door to the tower had to be 'cut through' (τῶι πύργωι θύραν διέκοψαν μέρος τι), which, 'suggests that the tower was the farm's most important secure space.' Burford 1993: 61 for urban contexts of towers. For comparative plans of 'tower-houses' see Keil & Wilhelm 1931: 46-7; von Gerkan 1935: 91-3; Holland 1944: 129-138, Jones, Graham, Sackett 1973: 431-443 (*cf.* architectural similarity between village and rural towers in medieval Central Italy, Lawrence 1964: 110).

[145] *IG* XII 5, 872.19 where the boundary of χωρία and ἐσχατιαι is described, 'ἡ ὁδός ἡ ἐκ κώμης ἀ[γο]υσα ἐπὶ τὸμ πύργομ' (*cf.* Nowicka 1975: 99 n.90).

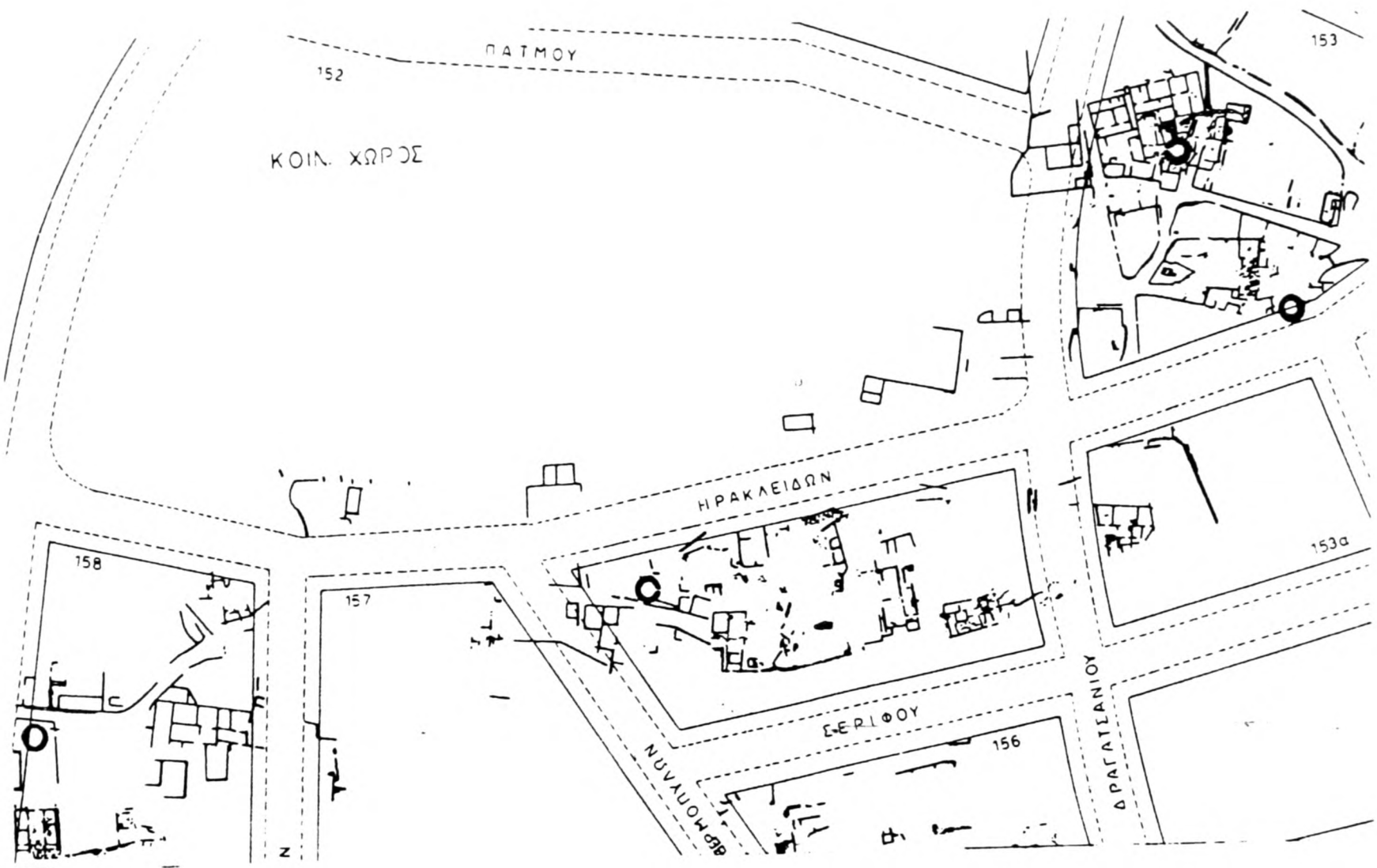

FIG. 3.8: *Towers and building complexes in the Attic village and deme centre of Halai Aixonides (after Steinhauer 1994 fig.11).*

CONCLUSIONS

Numerous functions of monumental rural sites are attested within public and private domains by literary, epigraphic and archaeological evidence.[146] It is clear that the interpretation of architecture and archaeological material at rural sites needs to be situated within a wider context of social history sensitive to topography, land use strategies and settlement. In particular, the storage facility of towers in rural areas forms an important category of use which has sometimes been neglected at the expense of a rather artificial polarity between 'strategic' and 'residential farmstead' functions. Secure storage areas of an *oikos* may not necessarily have been situated in the immediate vicinity of the primary household residence: risk spreading might go beyond strategies of land fragmentation and extend to diversified, seasonal storage according to the availability of labour and transport to process and carry agricultural produce from the countryside (for example in cases where landowners dwelt in the *asty* or a village).

The archaeological evidence of the Siphnian sites is considered in Part II, in order to examine contextually specific hypotheses concerning their use. The aim is to synthesise observable features of architecture in the extant sample of rural sites and integrate the data with locational factors.

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[146] Osborne 1986: 173; Koutsoukou & Kanellopoulos 1990; Cherry, Davis, Mantzourani 1991b: 291; Spencer 1993: 153; Konecny 1993: 54; Dousougli & Morris 1994: 218-9. The phenomenon is neatly summarised as 'Wehr, Wohn- und Wirtschaftsfunktionen' (Haselberger 1978a: 372).

PART II

MONUMENTAL RURAL SITES IN THE CHORA OF ANCIENT SIPHNOS

'Hypothetically, the economic relationship of a city to its countryside — we must start with a single city in isolation — can range over a whole spectrum, from complete parasitism at one end to full symbiosis at the other.'
Finley 1985a: 125

CHAPTER 4

SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE: ARCHITECTURE OF RURAL SITES

> τίς γὰρ ἐξ ὑμῶν θέλων πύργον οἰκοδομῆσαι οὐχὶ πρῶτον καθίσας τὴν δαπάνην, εἰ ἔχει εἰς ἀπαρτισμόν; ἵνα μήποτε θέντος αὐτοῦ θεμέλιον καὶ μὴ ἰσχύοντος ἐκτελέσαι πάντες οἱ θεωροῦντες ἄρξωνται αὐτῷ ἐμπαίζειν λέγοντες ὅτι οὗτος ὁ ἄνθρωπος ἤρξατο οἰκοδομεῖν καὶ οὐκ ἰσχυσεν ἐκτελέσαι.
> Luke 14: 28-30
>
> 'Suppose one of you wants to build a tower. Will he not first sit down and estimate the cost to see if he has enough money to complete it ? For if he lays the foundation and is not able to finish it, everyone who sees it will begin to ridicule him, saying, "This fellow began to build and was not able to finish".'

This chapter analyses the architecture, materials used in construction, organisation of internal space and structural orientation of Siphnian towers. The purpose is to consider aspects of ancient monumental construction within a social, rather than purely functional context.[1] As has been noted in architectural studies, durability alone does not make a building 'monumental'; such a description is also an expression of cost versus use.[2] Therefore an attempt is made to quantify the investment of labour and materials in such rural structures, and relate these estimates to theories of site use.[3]

The strength of this approach is in its potential to clarify possible relationships between architecture, location and function. A potential weakness may result if architectural typology is used as the sole determinant of tower function.[4] This pitfall can be avoided if the architectural information is then considered in relation to other factors, such as the presence of other structures found on site, and the location of these sites in the wider rural landscape.

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[1] Thus Rykwert 1996: 391, '"Plain reading" of a building is the univocal, antimetaphoric account of it that presents it as mute, as meaning no more than itself, the way it is built and used. The menace hidden in the discourse of a mute architecture is the ultimate barbarity that the developer's buildings may represent. Yet this notion of the mute architecture remains the dominant doctrine in architecture schools and of much architectural criticism. The mute Greek example has for too long and far too effectively been invoked to sanitize the building process and to present its products as incurably dumb.'

[2] Lefebvre 1974: 254. Here I differ from the definition of 'monumental' in Hansen and Fischer-Hansen 1994: 23 n.2 which suggests that 'monumental' buildings are built by the public for public use. See discussion above (p.115f) on the private dimension of monumental architecture.

[3] As Abrams 1989: 63, 'archaeologists do not excavate energy but rather the material embodiments of energy.' Kintigh: 1989: 25, Floud 1990: 28-33 generally for quantitative methods used in this chapter.

[4] As discussed above, Ch.3.

THE CONSTRUCTION OF TOWERS

GROUND-FLOOR AREA

All extant Siphnian towers comprise a round shape and a hollow ground-floor plan. Where ground-floors are partially filled (**19**, **21**, **23**, **25**, **27**), the rubble is clearly from collapsed walls rather than deliberately packed masonry (*Pl.19.1*). In this respect all Siphnian towers may be distinguished from types of solid-filled round towers, or half-filled, half-hollow 'compartment' towers found in Thasos and Attika respectively.[5]

Despite the problem of site destruction which may affect recovery and overall known pattern of towers,[6] the predominance of a circular plan, and the absence of any known examples of quadrangular plan structures is a remarkable feature of the rural archaeology of Siphnos. Although it is arguable that a round plan provided better protection against siege engines, which might attempt to dislodge corner masonry blocks from quadrangular structures, differences between plan shape are as likely due to stylistic factors.[7] However, it would be dangerous to assume 'uniformity' of function from uniformity of shape plan, without consideration of other factors.[8] Several potentially significant, distinguishing criteria — size (e.g. internal area and height), design (e.g. investment of labour and materials in construction) and location (e.g. orientation, aspect, and context of site) — may be considered useful in this respect since it is reasonable to assume that basic criteria of space and place would also have been important factors in the decision to construct the building.

Attempts to infer a direct relationship between tower size and function have tended to concentrate on 'military' functions of refuge and fortification, although recent attempts have applied a more integrated approach to tower dimension, location and function.[9] The quality of surviving ground plans generally makes it possible to calculate accurately the internal area of the

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[5] Munn 1983: 41; Ober 1985: 132-3; 148-9; 157-158; Lohmann 1992: 40 n.35 for solid-filled towers in Attika; Kozelj & Wurch-Kozelj 1989: 161-172 for solid-filled towers on the coast of Thasos; Thiersch 1909: 26-31 for examples in coastal areas of Egypt. On half-filled, half-hollow 'compartment' towers, see Vanderpool 1978; Camp 1991: 197-198; Munn 1993: 88-89; Thielemans 1994. These structures are usually ascribed a communication (or possibly cultic) function on account of their coastal and mountain locations. However, see below Chs.5-6.

[6] See above Ch.3.

[7] *viz.* differences in plan shape among Attic/Megarid towers (see Appendix 3.2). Camp 1991 argues that stylistic masonry comparanda can be used to differentiate the political identity of towers on the Attic-Boiotian borders by the use of a typology in which "compartment" towers in trapezoidal masonry are Boiotian watch/signal towers, and round towers in rubble or polygonal masonry, often with a solid base, are Attic signal towers (see Appendix 3.2, 3.3). *cf.* Cooper 1986 for discussion of structures on the Attic-Boiotian border, arguing that several identifications are based on unwarranted Atheno-centric assumptions.

[8] Osborne 1986: 166.

[9] e.g. Lawrence 1979: 189 claimed that military towers would be 4-15m in diameter/length, and that refuge towers would measure at least 7m in diameter/length. Both generalisations appear, however, too vague to have any significance. Now see Lohmann 1993a: 138-154; Yoshiyuki 1993: 9 fig.5 and Ch.3 above.

ground-floor for fifty-two Siphnian towers where the external diameter and wall thickness are known, and estimates from comparison with similar size towers can be made for a further two (**12**, **16**) where the approximate external diameter is known.[10] The external diameters of Siphnian towers range between approximately 4m (**42**) and 13m (**47**, **48**), but diameters around 6.5, 7.5 and 9m are especially common (*Figs.4.1-4.2*). According to an Ionic foot (measuring 0.295-0.297m) these diameters may correspond to diameters of approximately 22, 25 and 30 feet respectively.[11]

In order to provide a comparative context for this data, the internal area of Siphnian towers can be contrasted with the dimensions of towers recorded in southern Attika, since this region has been the subject of numerous intensive surveys and extensive individual inspections of rural tower sites, and contains one of the densest recorded distributions of stone towers outside Siphnos.[12]

A considerable difference between Siphnian and southern Attic rural towers is apparent in their internal ground-floor areas (*Figs.4.3-4.4*).[13] Only two recorded southern Attic towers (either quadrangular or round plan shape) possessed an internal surface area in excess of $30m^2$.[14] Most recorded southern Attic towers (13 of the sample) possessed an internal ground-floor area between $11\text{-}21m^2$, which compares closely with other Attic tower structures identified as part of larger domestic complexes.[15]

In comparison it is interesting to note that only one Siphnian tower possessed an internal surface area of less than $10m^2$ (**42**), and it is probably not coincidental that this tower happens to be one of the most haphazardly constructed edifices on the island, with irregular masonry and a supporting rock outcrop which would also have blocked any larger circumference (*Pl.42.2*).[16] Of the other six Siphnian towers less than $20m^2$ in surface area, **7** cannot be verified due to apparent site destruction, **23**, **26**, **30** and **31** are all rather limited from any larger diameter by their situation on rocky knolls.

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[10] See Appendix 1.2. The dimensions of **16** are unknown, and given extensive quarrying activity and agricultural building in the vicinity of the reported tower, it is assumed to be destroyed (Ashton 1991: 68-69). The tower was not located during extensive field walking of the region by the author in October-November 1995.

[11] N.B. Boyd & Jameson 1981: 332 for the variability of ancient Greek metrology.

[12] Of additional relevance to the present study is the influence of research in southern Attika, which played a role in the formulation of theories about Siphnian towers. See Young 1956a; 1956b for explicit comments about the mutual cross-pollination of theory and practice during his investigations in southern Attika and Siphnos. Unfortunately, the lack of precise architectural data concerning tower interiors at Chersonesos Taurike (Saprykin 1996) precludes a comparative study.

[13] Appendix 3.2 for full data on Attic tower sites.

[14] Langdon 1982: 94-95 favours interpretation of the Gur-I-Kuki tower as a fortification, noting the lack of space on the knoll for any other buildings; Lohmann 1993a: 142-3, 399-403 interprets the Gaidournisi tower complex as a homestead farm.

[15] The tower identified within the Vari House has an internal surface area of $9m^2$ (Jones, Graham & Sackett 1973: 366). See also Young 1956a: 134-135 (and below Appendix 3.2).

[16] Ashton 1991: 120-121.

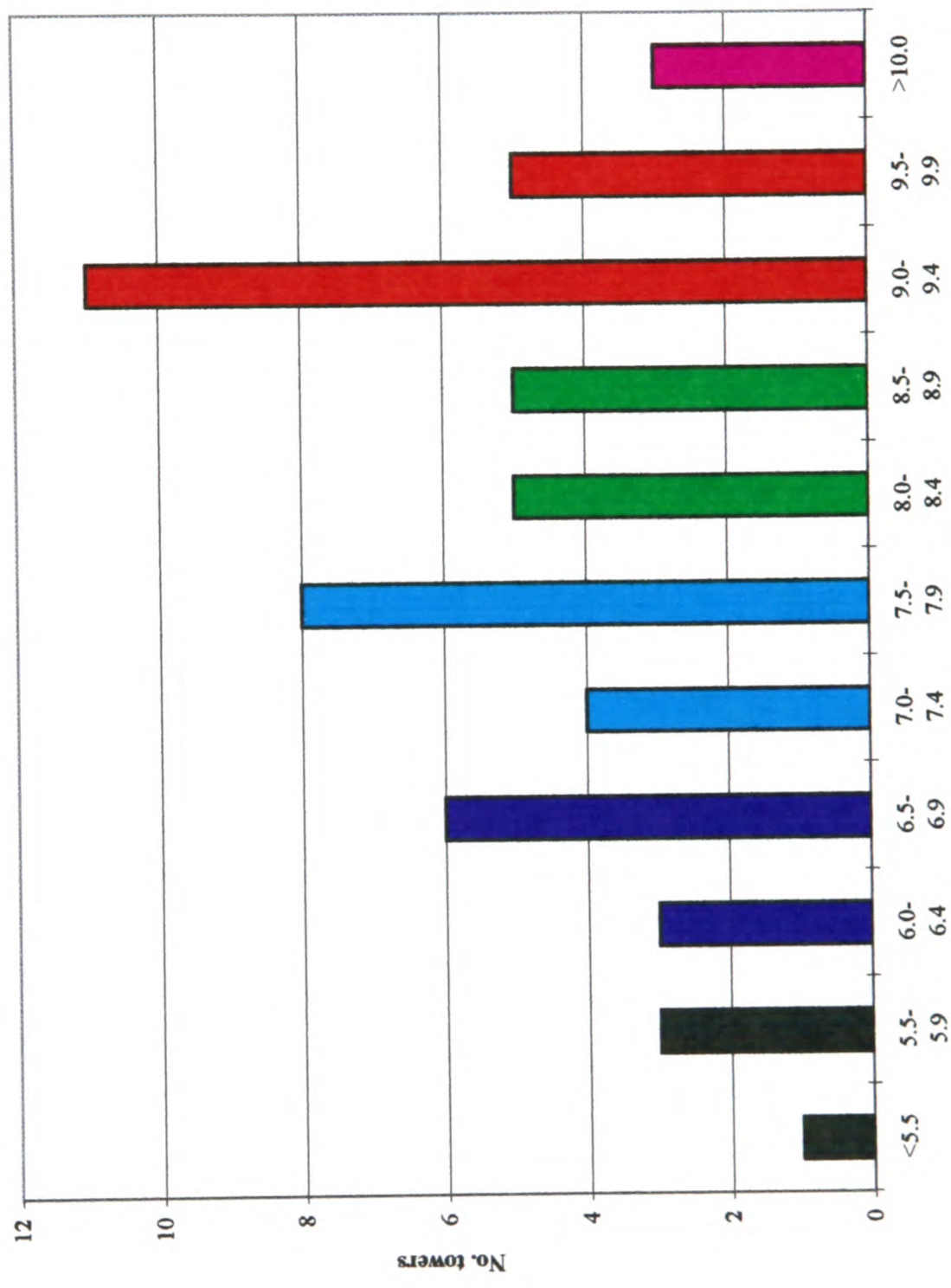


FIG.4.1: *Distribution chart of Siphnian towers' external diameters (54/55 recorded towers). 20% of tower diameters measure approximately 30-31 Ionic feet (9-9.4m). See FIG.4.2 for distribution of sites.*

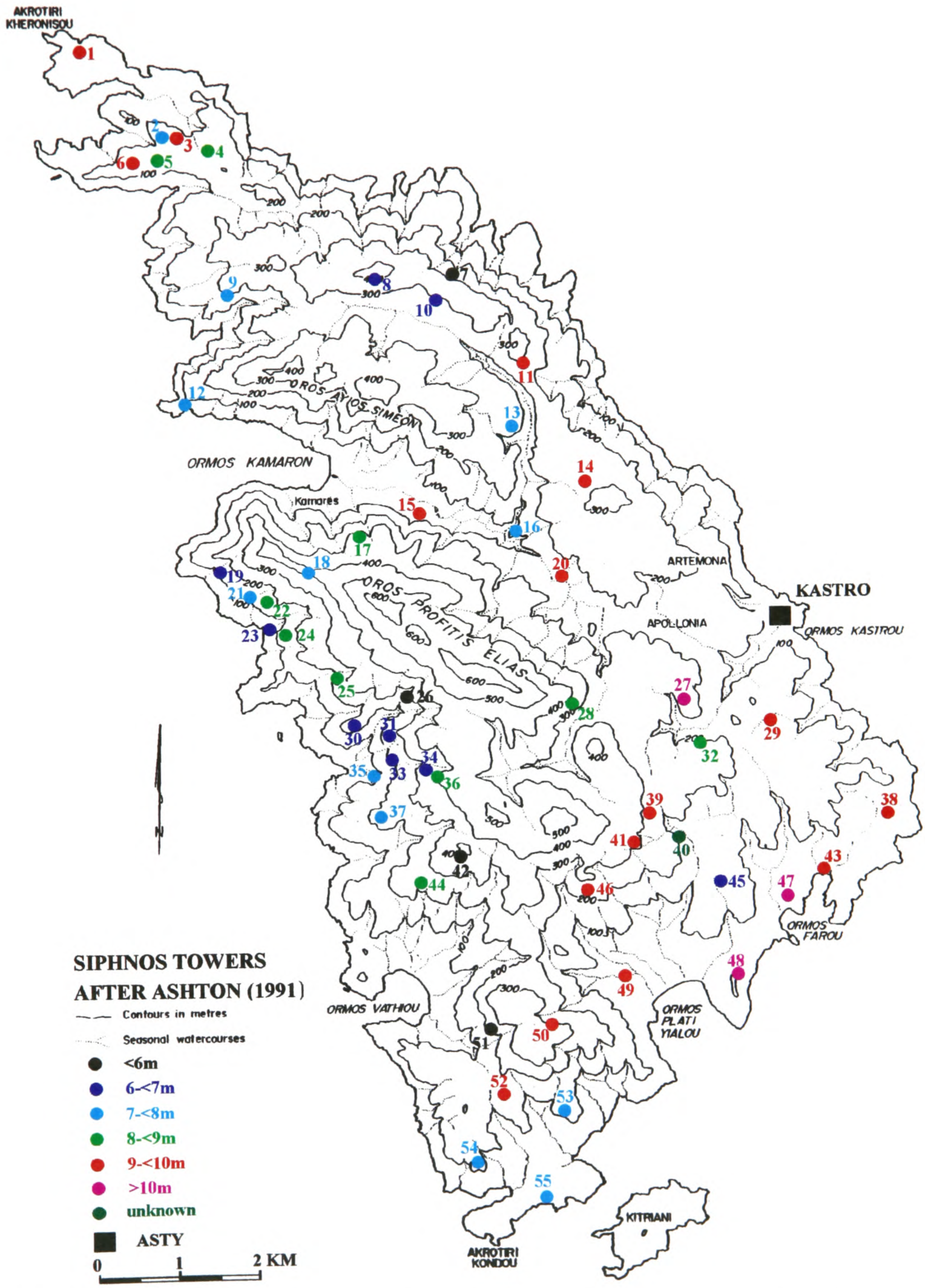
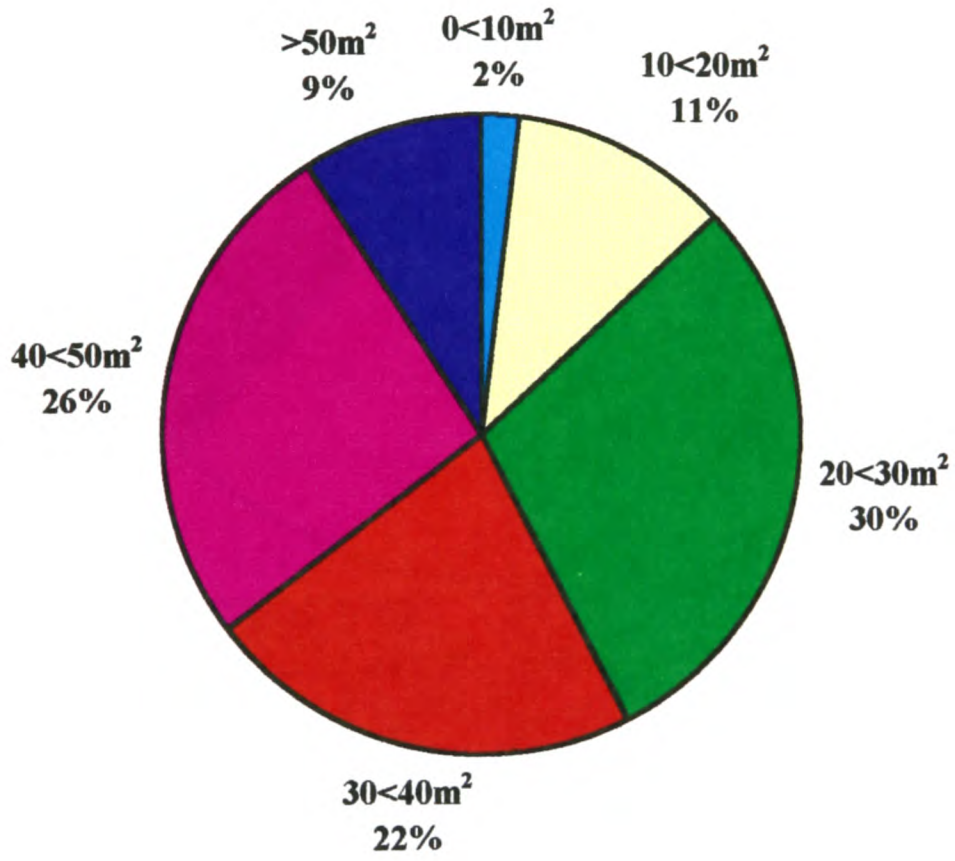


FIG. 4.2: *Map of Siphnian towers indicating distribution of external diameters. Larger area towers(>9m diameter) prevalent in south of island (plus* **1, 3, 6** *in extreme north). N.B. concentrations of similar size tower plans, e.g.* **53, 54, 55** *in south-west,* **30, 31, 33, 34** *in west.*

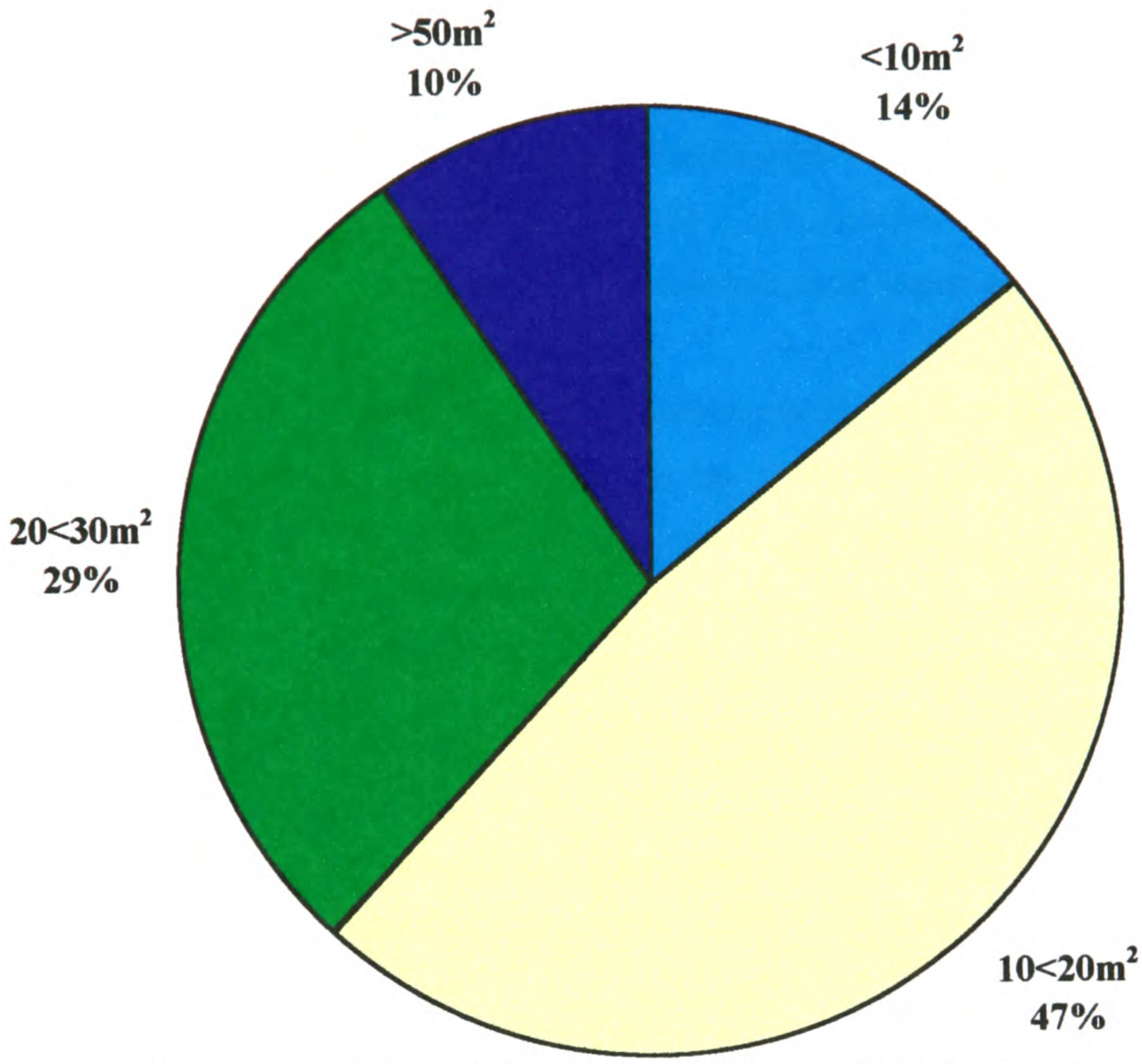
SIPHNOS TOWERS: INTERNAL SURFACE AREAS
SAMPLE SIZE = 54/55 RECORDED TOWERS



Internal s/area m^2	Siphnos No. towers
0<10m^2	1
10<20m^2	6
20<30m^2	16
30<40m^2	12
40<50m^2	14
>50m^2	5

FIG.4.3: *Pie Chart showing variation of internal surface areas in Siphnian tower plans. 87% of known structures with surface areas larger than 20m^2, 57% larger than 30m^2.*

INTERNAL SURFACE AREA OF TOWERS IN SOUTHERN ATTIKA. SAMPLE SIZE = 21 TOWERS FROM SURVEY



SOUTHERN ATTIKA SITES	P	Ext Dim (m)	Ext s/area m²	Block W (m)	Int Dim (m)	Int s/area m²
Gaidouromandra	□	~2.8+ x 2.5	~7	n/a	n/a	<7
CH 3B 2	O	4.7	17	0.8	3.1	8
Cliff tower	O	5.2	21	1	3.2	8
Red tower	□	4.4 x 4.4	19	0.6	3.2 x 3.2	10
Princess tower	O	5.8	26	1	4	13
LE 17	□	5.2 x 4.6	24	0.6	4 x 3.4	14
Yellow tower	□	6.6 x 4.1	27	0.7	5.2 x 2.7	14
CH 3B 1	O	5.8	26	0.7	4.4	15
PH 33	□	5.6 x 5.6	31	0.8	4.1 x 4.0	16
PH 2	□	5.4 x 5.4	29	0.6	4.1 x 4.1	17
Insula 3	O	7.5	44	1.3-1.5	4.7	17
TH 30	□	6.2 x 5.9	37	0.9	4.4 x 4.1	18
LE 5	O	7.5	44	1.3	4.9	19
Golden Pig tower	□	6 x 5.8	35	0.7-0.8	4.6 x 4.4	20
CH 3A	O	6.6	34	0.7	5.2	21
TH 37	O	6.7	35	0.7-0.8	5.2	21
TH 1	□	6.4 x 6.4	41	0.8	4.8 x 4.8	23
Hilltop tower	□	6.5 x 6.5	42	0.7	5.1 x 5.1	26
PH 1	□	6.7 x 6.6	44	0.7-0.8	5.2 x 5.2	27
GA 1	□	9.9 x 8.4	83	0.9-1	~7.9 x 6.4	~51
Gur-I-Kuki	□	~10 x 10	~100	~1	~8 x 8	~64

FIG.4.4: *Pie chart showing variation of internal surface areas in tower ground plans from southern Attika. Only 2 towers > 30m², with majority of towers 10-20m².*

In contrast to those Attic structures characterised as 'farm-towers', 47 (78%) of known Siphnian towers possessed an internal base area larger than $20m^2$, and nearly 60% exceeded $30m^2$ (i.e. over three times the area of the Cliff, Princess and Red 'farm-tower' structures of southern Attika), with the largest internal base area (**47**) in excess of $92m^2$.[17] However, it might be argued that the nature of much archaeological survey in these areas favoured the discovery of larger sites, and that differences in data collection may have resulted in smaller tower sites not necessarily being recorded on Siphnos. Nonetheless, direct comparison between similar size tower plans on Siphnos and southern Attika reveals considerable differences in the quality of construction: the irregular, rubble construction of the lower courses in many southern Attic towers stands in stark contrast to the cut, coursed masonry of Siphnian towers.[18]

Therefore from a purely 'functional' perspective (given the importance of a tower's internal area to its potential storage or dwelling facilities), the efforts of tower construction in southern Attika appear distinctly small-scale in comparison to the size of building on Siphnos. In a wider social context this notable difference becomes even more intriguing, since many Attic structures have been explicitly interpreted as part of permanently inhabited, household farmsteads, which may have worked relatively large areas of land (and thus processed and stored corresponding amounts of agricultural produce).[19] The 'over-size' appearance of Siphnian ground-floor tower plans — at least for the agrarian needs of one isolated *oikos* dwelling — may therefore suggest rather different underlying concerns behind their construction.

TOWER HEIGHT AND WALL THICKNESS

In evaluating the level of investment undertaken in the construction of a tower (which includes estimates of overall internal space), consideration of the building height is a crucial factor. Siphnian towers range in height of preservation from the foundation course (**1**, **5**) to over 5.5m (**27**, **48**) (*Pl.27.1*, *48.1*), with most preserved to a height of 1.5-2.5m. Buttressed foundations are rare, with only two towers (**10**, **15**), both located on valley slopes, displaying any evidence of such foundation support (*Pl.15.1*).[20] Only **27** appears preserved to near its original height, where drainage channels

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[17] See below Appendix 1.2.

[18] Compare Lohmann 1993a (esp. 147 fig.26) with Ashton 1991 *passim*. Chinking stones inserted in gaps of masonry may be found in some Siphnian towers (**24**, **30**, **33**, **39**, **51**, **52**), although it is not clear whether this is original or later patched material. Yener 1995: 95 for chinking stones in Lykian towers; Spencer 1995c: 59-60 in Lesbian masonry towers on Lesbos. See also below pp.158-163.

[19] According to Lohmann 1992: 51, 8 or 9 of 33 'farmsteads' in the Atene region of southern Attika occupied whole valley sections 25 ha. or more in size. See below Ch.7.

[20] Ashton 1991: 56-57, 66-67 (*cf.* Lock 1986: 105 for the general absence of buttressed foundations in medieval mortared towers).

are found in the sixteenth-course (the highest extant layer).[21] However, drainage cuttings and waterspouts occur in upper, but not top-most courses of Megarid towers C and F, and it is possible that the tower may have originally stood taller if the spouts were part of a drainage and water collection system.[22] Despite the absence of fully preserved *in situ* masonry at tower sites, some estimate of the original height can nonetheless be made, firstly from the evidence of upper storey structures (such as staircases), and secondly from approximate estimates of the amount of masonry rubble in and around a tower.

Structural evidence for the presence of at least one upper stone storey is provided by remains of cantilevered, stone staircases - either the slabs themselves or corbel holes - which ascend anti-clockwise (clockwise in the case of **48**) from both jamb-lintel and arch entrances (*Table 4.1*).[23] Where the internal wall lining is preserved, corbelled stone staircases appear a common feature; in addition, the architectural planning required to build cantilever steps strongly suggests an architect's plan.[24] Square shaped socket holes found in internal walls at a height of approximately 2m (**15**), indicate upper-floor beams, which may in some cases have been of stone (**30**).[25]

However, the question of upper storey height is much debated, in particular the extent to which it is possible to infer the likely original height of a poorly preserved tower from wall thickness, based on well-preserved structures such as the tower of Ayios Petros on Andros (20m height), Ayia Marina on Keos (17m height, *Pl.I.70*), Kheimarrou on Naxos (15m height), and Phanari on Ikaria (13m height), each comprising 3-5 storeys of high quality, coursed masonry with walls 1m or less in total thickness.[26] In contrast, mud brick construction with wall width 0.4-0.5m might support one storey.[27]

Young proposed that the maximum theoretical height of a stone tower might be two and one half times the diameter, and Lawrence noted that the height of both circular and quadrangular towers

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[21] Ashton 1991: 90-91.

[22] Hammond 1954: 109 for waterspouts. Thielemans 1994: 141-2 discusses the height of towers with regard to drainage systems.

[23] Staircase steps in Siphnian towers are approximately 1m in length, 0.2-0.4m in width and 0.2-0.4m in height (see plans in Appendix 1.3).

[24] Only **33** featured a different arrangement of step shape, with cantilevered rectangular slabs (Ashton 1991: 102). For cantilevered stone staircases between upper floors of stone towers, see Haselberger 1972: 437; 1983: 23-4 (Kheimarrou tower, Naxos). Also Haselberger 1978a: 369 fig.20; 1983: 101-2 (Ayia Marina, Keos), Haselberger 1983: 76-7; Coulton 1988: 149 (Ayios Petros, Andros). Identification of other types of staircase is problematic - wooden staircases may have left beam holes in stone masonry, but ladders can only be hypothesised in the absence of any other means of entrance to upper floor levels (e.g. Étienne 1990: 31 for Smovolon tower on Tenos).

[25] The extant height of **30** is 2.2m, even after apparent patching work. Large amounts of fallen masonry are found in the immediate vicinity (Ashton 1991: 96 photo 30A).

[26] See Appendix 2 for full details. Ayios Petros, Andros - Sauciuc 1914: 29-33; Haselberger 1983: 59-90. Ayia Marina, Keos - Haselberger 1978a: 367-9; Cherry, Davis, Mantzourani 1991b: 286. Kheimarrou, Naxos - Haselberger 1972; 1983: 7-58. Fanari, Ikaria - Papalas 1992: 93-97.

[27] Jones, Graham, Sackett 1973: 425.

TOWER NO.	STRUCTURAL EVIDENCE OF UPPER STOREY
1	aS
15	B
18	aS
19	aS
20	aS
21	aS
25	aS + W
27	aS
30	B; aS
31	aS
33	aS
35	aS
36	aS
39	aS
44	aS
48	cS
52	aS
53	aS
	aS= anti-clockwise stone staircase
	cS= clockwise stone staircase
	B = beam socket
	W = support wall

TABLE 4.1: *Evidence of upper storeys in Siphnian towers.*

INNER FACING THICKNESS (m)	NO. TOWERS	OUTER FACING THICKNESS (m)	NO. TOWERS	MINIMUM TOTAL WALL THICKNESS (m)	NO. TOWERS
0.1	2	**<0.5**	3		
0.2	9	**0.5**	**14**		
0.3	19	**0.6**	17	**0.6**	5
0.4	7	**0.7**	7	**0.7**	5
0.5	2	**0.8**	6	**0.8**	22
>0.5	1	**0.9**	2	**0.9**	8
		1	3	**1**	8
				>1	4
UNKNOWN	15	**UNKNOWN**	3	**UNKNOWN**	3

TABLE 4.2 *Thickness of Siphnian tower walls.*

	NO. OF TOWERS	TOWER NUMBERS
CUT MASONRY (coursed)	**44**	1-2, 4-7, 9-11, 13-15, 17-23, 25-29, 32-39, 41, 43-44, 46-55
RUBBLE MASONRY (uncoursed)	**3**	3, 8, 24
RUBBLE/CUT MIX	**5**	15, 30, 31, 42, 45
UNKNOWN	**3**	12, 16, 40

TABLE 4.3 *Types of masonry in Siphnian tower walls.*

TOWER	INTERNAL DIAMETER (m)	EXTANT HEIGHT (m)	VOLUME OF EXTANT TOWER (m^3)	APPROXIMATE VOLUME OF MASONRY (m^3) AT 50%	WALL MASONRY AREA (m^2)	ESTIMATED ADDITIONAL WALL HEIGHT (m)	MINIMUM TOWER HEIGHT (m)
25	7.1	2.9	115	57	19	3.0	5.9

TABLE 4.4: *Estimated minimum original height of masonry filled tower* ***25****. Figures from Appendix 1.2.*

with well-laid ashlar masonry might exceed the wall thickness by over twenty times.[28] Nonetheless, the exact number of upper storeys remains hypothetical in most cases, since Young and Lawrence's calculations were made for the maximum feasible height/thickness ratio, and of course do not preclude the construction of towers built well within such architectural parameters.[29]

From the evidence of 40 surviving examples, Siphnian tower walls typically comprised an inner facing 0.2-0.4m in thickness (*Table 4.2*). In all 52 Siphnian towers where dimensions are known, an outer facing exceeded at least 0.5m in thickness, and the total wall thickness exceeded 0.6m, with most towers possessing walls at least 0.8m in total thickness.[30]

The majority of Siphnian towers are also constructed of well-laid masonry — a further architectural feature which would support a height of several storeys — and a point of contrast with the Attic 'farm-towers' noted above. Only a handful of towers are made of rubble masonry, with 44 of the 52 towers whose masonry arrangement is known employing ashlar or trapezoidal blocks in neatly laid isodomic or pseudo-isodomic courses (*Table 4.3*).[31]

Another approach to estimating the approximate height of towers may be utilised where stone masonry has collapsed at the site, filling the volume of the tower with cut masonry. This is only a crude, positivist estimate of the extant material, and does not take into account the possible re-use of tower masonry off-site. However it may at least suggest a minimum number of storeys.[32]

Such an estimate may be calculated for tower **25**, where collapsed masonry currently fills the tower to its extant height of 2.9m (*Table 4.4, Pl.25.1*). There is also a considerable volume of collapsed masonry lying around the tower, which would have added further height, but which is not included in the estimate.[33] As a conservative working estimate, the volume of masonry contained in the tower is calculated at 50% of the overall tower volume, thus allowing for space between blocks in the rubble-fill, as well as collapsed internal masonry, such as staircases and partition walls. Since the volume of masonry contained in the wall can be calculated from the known internal and external tower diameter, rubble-fill can be translated into a figure representing additional full

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[28] Young 1956a: 135; Lawrence 1979: 190.

[29] As noted by Cherry, Davis, Mantzourani 1991b: 286-287. Thielemans 1994: 140 n.84 argues that Lawrence's observation on height and wall thickness ratio is limited to Vathychoria towers C and F, and cannot be used as a working generalisation. Thielemans reviews evidence for the height of Attic towers, and tentatively concludes that structures less than 7m in diameter with irregular masonry might reach up to 12m in height, those of larger diameter and well cut masonry some 14m in height.

[30] For the use of small stone inner-wall linings in Lykian towers see Yener 1995 (*cf.* Saprykin 1994: 22 for their use in the tower complexes of Chersonesos Taurike).

[31] Rubble masonry towers could also reach a height of several metres if closely packed, although most examples are those of the solid filled type. See Vanderpool 1978: 240 on the Limiko tower, Ober 1985: 176 on the Doskouri Tower (Appendix 3.2 below).

[32] See estimates of original height from rubble masonry by Ober 1985: 157-8 for Velatouri tower; Munn 1993: 70 n.13 for Dema tower, and now Thielemans 1994 for a review of estimates concerning tower heights.

[33] Ashton 1991: 86 photo 25A (**25**).

circumference height.[34] An additional height of approximately 3m may be estimated by this method, suggesting an original height in excess of 6m, i.e. at least two upper storeys (where storeys are 2-2.5m height).

In general, evidence for perishable construction material (such as mud brick and wood) in the exostructure of the upper storeys is, unsurprisingly, absent from the archaeological record.[35] Red earth deposits at a rural site may be symptomatic of mud brick upper storeys, and such would be relatively conspicuous on the stony ground and rock outcrops of many Siphnian tower locations.[36] Only at **28** is there a visible red earth-fill, but this is probably caused by weathering processes which create *terra rossa* throughout the slope (*Pl.28.1*). Additionally, circumstantial evidence may be adduced by the fact that in no surviving case of inner and outer facing is the total wall thickness demonstrably 'excessive', in the manner of ground floor walls (found in towers elsewhere) which appear to have supported mud brick upper-storeys.[37]

In conclusion, it is worth observing that to assume a 'uniform' height among monumental structures is an unwarranted assumption: indeed variability of ground-floor size among Siphnian structures also suggests variability in height. It is enough simply to point out that the ground floor and a single storey of the majority of these architecturally planned buildings would enclose an area larger than a Attic 'farm-tower' might achieve even if built to a height of 4 storeys. The wall thickness of all known Siphnian towers usefully illustrates their capability to support several stone upper storeys (to a height in excess of 10m). In addition, the quality of masonry used in construction, the wall thickness of extant structures, and estimates from comparative architecture indicate that Siphnian towers were designed for an least one upper-storey above the ground-floor,

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[34] It is not possible to infer a taper inwards in Siphnian towers, as occurs in the upper storeys of some tall round, stone towers, e.g. 3.5% taper on Ayios Petros, Andros (Haselberger 1983: 62), 2.5% taper on Kheimarrou, Naxos (Haselberger 1972: 435; 1983: 11), Tower F in Vathychorio, Megarid (Hammond 1954: 109; Muller 1982: 393; Ober 1987b: 592), though this does not mean that Siphnian towers never reached comparable heights.

[35] Literary evidence: Xenophon *Anabasis* VII.8.14, where the tower's wall thickness of 8 mud bricks proves too much for Xenophon and the besiegers (ὁ δὲ τοῖχος ἦν ἐπ' ὀκτὼ πλίνθων γηίνων τὸ εὖρος). Also Pliny *NH* XXXV.169 for the durability of Hannibal's earthen towers in Spain.Winter 1971: 173 for archaeological evidence of wooden and mud brick towers. On lease inscriptions from Arkesine on Amorgos (*SIG*^{3} 963.26 'τέγη στεγνὰ παρέξει') and a *horos* boundary stone from Keos (*SIG*^{3} 964A 11-14) suggesting mud brick and wooden frame construction of rural buildings, see Osborne 1985b: 123. For the expense of wood in rural construction, see Hanson 1983: 90-1.

[36] Munn 1993: 68 on earth deposits from mud bricks at tower sites (for costs of bricks see Maier 1961: 66 n.117, 71-5). Lord 1938: 489-90 argued that Argolid blockhouses did not possess mud brick upper storeys. The evidence is reviewed by Munn 1983: 329-337 in favour of mud brick storeys on top of a wooden ground-floor ceiling; see also Pikoulas 1996 figs.1-3 for hypothetical reconstruction of upper storeys.

[37] Of the four towers with total wall thickness significantly in excess of 1m (**46** - 1.2m; **47** - 1.2m; **27** -1.5m; **48** - 1.5m), two at least (**27**, **48**) possessed stone upper storeys. Stroud 1971: 129 argues that the roughly ashlar, grey limestone walls of the Mt. Oneion tower, over 1.5 m in thickness, were excessive if cut stone masonry was used in the superstructure, and suggests that mud brick would have been used in the upper storeys. N.B. also the (excessive) thickness of masonry in Lesbian tower enclosures (Appendix 2.5), where upper storeys are no longer extant.

reaching a minimum of 5-6m in height, and it is likely (given surrounding rubble) that towers stood taller.[38]

However, to attempt a functional typology based on wall thickness alone, as has been tried elsewhere, is inconclusive, and indeed is methodologically unsound, as by trying to relate site use to just one architectural feature, it runs contrary to the contextual approach which has been stressed throughout this case study.[39]

INTERNAL ORGANISATION

Partition of ground-floor space

Ground-floor dividing walls are one of the most consistent internal architectural features in Siphnian towers where diagnostic evidence survives. 29 towers exhibit an internal division of the ground-floor (*Table 4.5*), usually built with a double wall of small stones, or in some cases, worked blocks 0.5-1m in thickness.[40] The effect is to partition the internal surface area of the ground-floor into at least two rooms. In general, walls are orientated to run parallel with the ground-floor entrance; only one tower (**51**) certainly possessed an internal wall at a right angle to the entrance, although this may have also been the case in another four towers where the circumferences are partially destroyed.

Where there is a single wall, the staircase always ascends from the entrance away from the smaller of the rooms. Where there is a double wall (**48**) the staircase ascends around and above one of the partitions. The smaller partitioned room in most cases occupied less than a third of the internal area. For such relatively small demarcated areas, considerable effort appears to have been expended in the construction of a sizeable doorway together with the thickness of wall.

The height of these preserved walls range from the base course (**9**) to 2.2m (**48**). Doorways are preserved in a number of examples, with lintels (**48**), thresholds (**38**) and blocks (**9, 36**) indicating that the walls were part of a separate partition, and were not merely support walls. Where an identifiable internal support wall occurs (**25**), a double block wall (in addition to the inner lining)

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[38] Hohmann 1983: 30 fig.8 reconstructs **48** to a height of 6m with a single upper storey, although it is the opinion of this author that Aspros Pyrgos stood higher (to at least a second-floor), since Hohmann's reconstruction is unlike any other known stone tower of comparable dimensions, appearing too 'squat' and ignoring the evidence of fallen masonry on site.

[39] Nowicka 1975: 41 attempts to use wall thickness as a criterion for distinguishing military towers, but as Munn 1983: 27 observes, the evidence on the matter is equivocal and Nowicka's application of the criterion is inconsistent. Munn 1983: 59 reviews evidence of Attic towers and questions the assumption that 'military' tower architecture would necessarily have been more substantial in the thickness and height of walls than 'domestic' construction, though note Maier 1958: 23 n.30, who points out that curtain wall towers possessed considerably greater thickness (usually 2-3m), weakening the thesis of Ober 1987b that several rural towers were built for ballistic purposes.

[40] Some internal walls appear to be later additions in conflict with other aspects of the tower plan (**27**, **30, 39**) but in each case there is also evidence of an original internal wall (see Appendix 1.3).

runs through an arc of 90° around the inner circumference between staircase and dividing wall, at the likely height of ground-floor ceiling.[41]

All extant internal doorways are over 0.8m in width, and in many cases correspond closely to the size of the main, external entrance.[42] It seems unlikely that such an area was partitioned and secured for primarily habitation reasons, although the versatility of domestic space did not exclude such occasions.[43] The sizeable width of these internal room doorways suggests that the space within may have been used for the secure storage of large objects, a hypothesis consistent with the association of towers with moveable property suggested in literary and epigraphic sources.[44]

Although not relating specifically to a tower, vertical ordering of storage space according to dryness, coolness and light respectively, is also suggested in Xenophon's idealised description of an *oikos*,[45]

> ὁ μὲν γὰρ θάλαμος ἐν ὀχυρῷ ὢν τὰ πλείστου ἄξια καὶ στρώματα καὶ σκεύη παρεκάλει, τὰ δὲ ξηρὰ τῶν στεγῶν τὸν σῖτον, τὰ δὲ ψυχεινὰ τὸν οἶνον, τὰ δὲ φανὰ ὅσα φάους δεόμενα ἔργα τε καὶ σκεύη ἐστί.
> Xenophon *Oeconomicus* IX.3
>
> Thus the store-room calls for the most valuable garments and equipment to be placed in its stoutness, the dry, roofed places for the grain, the cool places for the wine, and the light places for all those things and activities which require it.

Thus the presence of internal partition walls in the ground-floor of towers has been interpreted as an indicator of a domestic function, with an explicit association made between the partitioned space and a storage room (πίθων) attested epigraphically for a Tenian tower, and archaeologically in towers of Chersonesos Taurike.[46] A substantial *pithos* is embedded within the partitioned area of **23**, but at another tower there is evidence of a basement area below the staircase, where a double block partition also existed at ground level (**25**).[47] However, secure storage for domestic produce,

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[41] Ashton 1991: 86-7.

[42] Internal wall doorway widths: **9** - 0.85m; **18** - 0.95m; **19** - 0.90m; **21** - 0.90m; **23** - 1.10m; **28** - 0.90m; **29** - 0.90m; **30** - 1.00m; **31** - 0.80m; **33** - 0.90m; **36** - 0.90m; **39** - 0.90m **48** - 2 x 1.20m.

[43] See Jameson 1990a: 184 on the arrangements in Plato's *Protagoras* 315D, where a storeroom (ταμεῖον) was converted into a bedroom for a guest.

[44] [Dem] XLVII.63 for moveable property stored inside the same tower in which the slave women dwelt. Also *IG* XII 5, 872.48-52, 61 for internal divisible space of towers (see p.119 above). For restricted access to lockable (storeroom) chambers according to gender and status, Aristophanes *Thesmophoriazousae* 421-423.

[45] Xenophon *Oeconomicus* IX.3, followed by Young 1956a: 143; Munn 1983: 35 n.86-7; Amouretti 1986: 72. Burford 1993: 250 n.43 notes that the dimensions (15 x 15 feet) of a granary in an inscription from Heraclea in southern Italy (*IG* XIV 645 l.138-141) bear similarity with some smaller rural towers recorded in the Mediterranean.

[46] Kent 1948: 295; Young 1956a: 137; Étienne 1990: 26 on *IG* XII 5, 872.53. See Saprykin 1994: 15, Plate 4 for circular cuttings in the pavement of a ground-floor tower belonging to Herakleian peninsula Plot No.9, which indicated *pithoi* storage within the tower. For the *pithon*, Robinson 1934: 128; Lazaridis 1961: 426-428.

[47] Ashton 1991: 86-7.

internal wall(s) parallel to entrance	internal wall(s) at 90° to entrance	internal wall-door entrance orientation unknown
1	3 ?	37
4	8 ?	38
9	23 ?	
10	34 ?	
17	51	
18		
19		
21		
25		
26 ?		
27		
28		
29		
30		
31		
33		
36		
39		
44		
48		
50		
53		
54		

TABLE 4.5: *Relation of extant internal walls to ground plan of towers.*

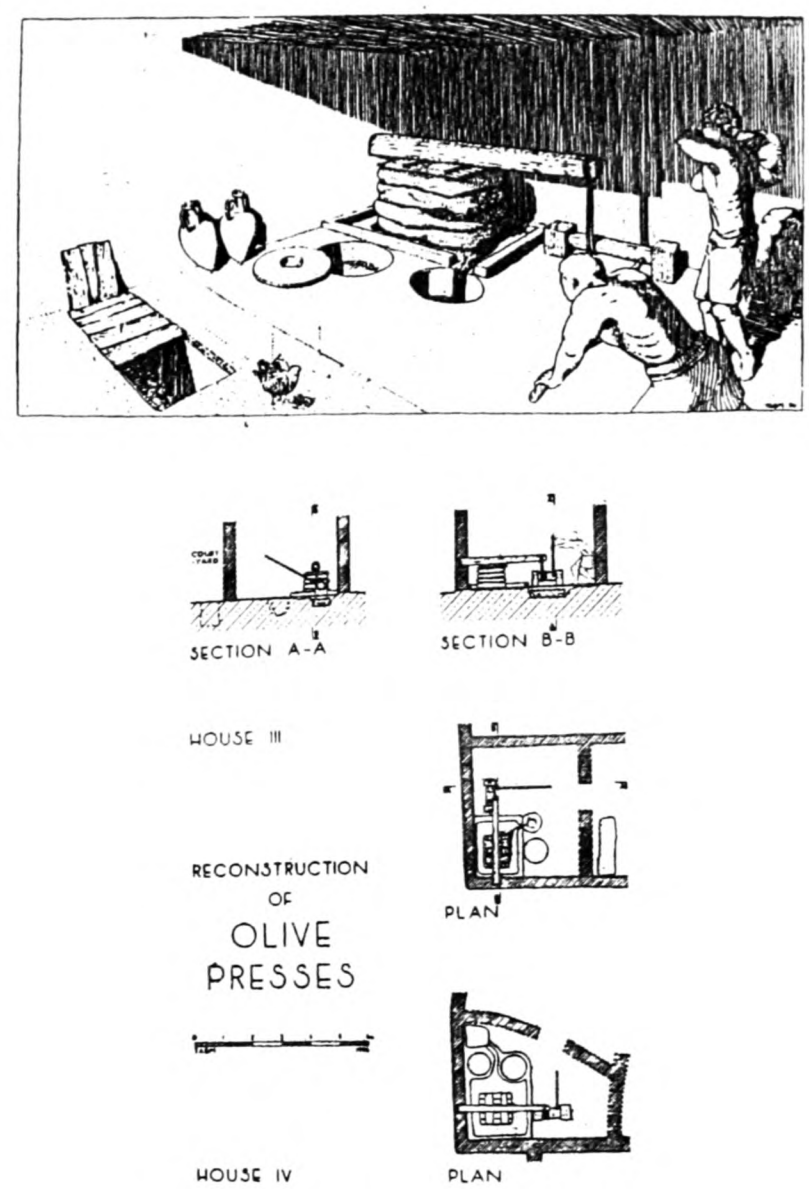

FIG.4.5a: *Plan of olive presses at Rachi settlement. Isthmia (after Archaeology in Greece 1996-7 fig.19).*

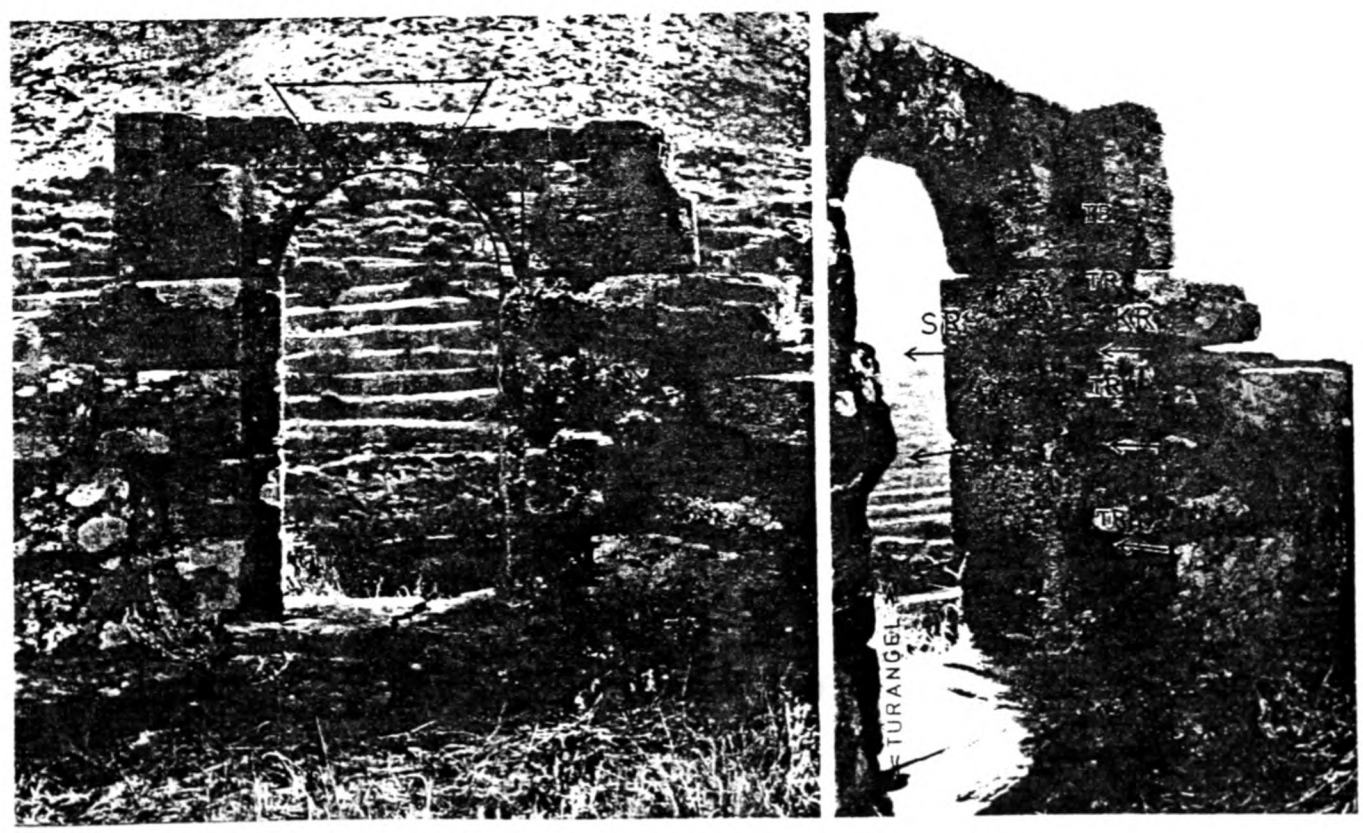

FIG.4.5b: *Tower* **20** *entrance interior with door hinges (after Haselberger 1978a: 355 fig.10).*

utensils and items of special use might also be referred to as an ἀποθήκη, θάλαμος, καλιά, ταμειῶν. All these structures could be located in the lower quarters of buildings, and therefore it is probably better to consider partitioned areas from archaeological evidence in more flexible terms, without uniform categorisation according to one functional name type.[48]

A notable internal arrangement occurs at **48**, where stone receptacles were built into the ground-floor of the central section near the doorway; the remains of a stone press are located a few metres away (*Table 4.9; Pl.48.3*).[49] The arrangement is similar to domestic olive press installations at Halieis in the Argolid and the Rachi settlement at Isthmia (*Fig.4.5a*), where *pithoi* were sunk into the ground-floor as run-offs and settling vessels for the stone presses.[50] Again, the presence of an agricultural processing installation does not necessarily indicate *permanent* habitation at the tower site, nor can we assume that storage area was restricted to a portion of the ground-floor area, with the rest of the internal space devoted to habitation areas.[51]

Access and security

As more scholarly attention has been paid to the architectural division of space and its social significance in classical antiquity,[52] another aspect of internal organisation relating to gender and status has been suggested in the light of the description of the θεράπαιναι (usually interpreted as household slaves) in [Dem.] XLVII.56, namely that towers provided secure domestic accommodation for dependent members of an *oikos*, or chattels engaged in agricultural or mining activities.[53] Thus towers in effect acted as prisons which were locked from the outside.[54] This theory can be challenged effectively on several grounds.

Firstly, the social seclusion of tower occupants appears something of an ideological *topos* in literary sources, e.g. the unmarried daughters of Lykomedes on Skyros (Philostratos Jun. *Imagines* I.1-3), Hero in her tower (*Anth. Pal.* IX, 381; Strabo XIII.1.22; Ovid *Heroides* XVIII.105-116). Therefore it would be incorrect to assume, on the basis of literary sources intent on portraying

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[48] Several of these, and other terms of storage appear with πύργος and πυργίον in the temple inventories of Delian Apollo (Kent 1948; Vial 1984: 317-356; Osborne 1985b; Brunet 1990a; Reger 1994: 189-197). From Menander *Samia* 233-234 it appears that ταμειῶν was used to refer to a store-room in an inhabited building.

[49] Hohmann 1983: 30 fig.7, 36 fig.22. Mattingly 1988: 187, 'Press beds often feature a circular or square channel surrounding the area where the pulped olives were placed for pressing. Oil oozed into the channel and was carried off to separating vats.'

[50] Van Andel & Runnels 1987: 106 fig.6; Ault 1994: 200, 205 fig.2, 206 fig.3. *cf.* shape of wine presses found in Delian farm sites (Bruneau & Fraisse 1981; 1984).

[51] For domestic storage rooms, see Jameson 1990a: 185. For agriculture and site use, see below Ch.6.

[52] Walker 1983; Jameson 1990a, 1990b; Nevett 1995a, 1995b.

[53] Gould 1980: 47 (*cf.* Schnurr-Redford 1996: 146) suggests that segregation was both according to gender and status: *slave* women were kept in the tower, free women dwelt in the *oikia*. For the status of mine-workers, Osborne 1986: 175, 1987: 77-9; Garlan 1988: 63-66. For agriculture and mining, see also Ch.6 below.

[54] Dousougli & Morris 1994: 218-9, 'The occupants proposed for these structures would have financed the construction of their own prisons'. Also Preziosi 1994: 69-70 explicitly in connection with Siphnian towers.

tower occupants in this idealised manner of gendered seclusion, that towers which show evidence of internal partition were permanent dwellings for slave women and female minors.[55] While private, domestic space might be divided along the lines of segregated male and female quarters (such as a *gynaikeion*),[56] it is clear that segregation is not the same as social seclusion.[57] Indeed it is arguable that the strictest gender segregation would have occurred in urban areas: in the countryside, the practicalities of 'domestic' work would have entailed a wider spatial dimension for female chattels.[58]

This hypothesis also needs re-evaluating in the light of the Siphnian data, which provides substantive evidence for stone thresholds and large, thick wooden doors locked from the *inside*,[59] in particular at **48** where two hollow marble rings would have been fitted with a bar from the inside (*Pl.48.2, 48.4*), and also at **21** and **36** where squared hole cuttings on the inner side of certain jambs indicate the use of a bolt.[60] Elsewhere (e.g. **20**, *Fig.4.5b*) evidence of locking devices is less clear; recesses may in fact have existed for wooden door hinges.

In fact, the presence of an external locking mechanism, as might complement a wooden door, cannot be used to support theories of slave incarceration – things other than the lowest-status *andrapoda* or *douloi* (especially those engaged in bausanic activity) might be locked up in such elaborate and decorative structures – especially since literary and archaeological evidence attests to the use of simpler, but nonetheless effective means of confinement through chains.[61] Locking devices are perhaps more indicative of secure storage where activities might involve specialised

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[55] Just 1989: 113-114; Katz 1995 on the ideology of sexual segregation and female seclusion; Cartledge 1993: 169-170 on the polarity of free/unfree. As Walker 1983: 81 notes, 'Keeping women in seclusion may be something that most people in a given area desire, but it may entail expenses which the very poor cannot meet...The seclusion of women may thus become a status symbol, indulged in by those who can afford it, and emulated by others striving for respectability.' Schnurr-Redford 1996: 179-180 for the idealisation of gender seclusion in the story of Hero and Leander.

[56] Xenophon *Oeconomicus* IX.5; Pomeroy 1997: 28-33.

[57] Pomeroy 1975: 80, 1997: 7-10; Cohen 1989: 7, 1991: 149-154.

[58] Blundell 1995: 136-137.

[59] The evidence is actually better preserved than at excavated settlements such as Olynthos (Robinson & Graham 1938: 251-253 for the general paucity of material there).

[60] Holes in door jambs - **21** (Ashton 1991: 78-9); **36** (3 x 3cm width/height, 13cm deep - personal observation). Recesses in 'arches' (hinges and possibly bolt holes) - **11** (Ashton 1991: 58-9); **20** (Haselberger 1978a: 355 fig.9, 361 fig. 14; 1978b: 149); Ashton 1991: 76-7), **27** (Ashton 1991: 90-1). See Dawkins 1902-3: 190-5 for wooden lock devices on hinged doors which incorporated a bolt turned by a key. Stone bolt-hole rings - **48** (Haselberger 1978b: 148; Hohmann 1983: 34; Ashton 1991: 132-5). For doors and hinges generally in ancient buildings, see Hoepfner & Schwander 1994: 314-6. The general description of door hinges and locks in houses at Olynthos (Robinson & Graham 1938: 253-263) illustrates that differentiation of different types of fitting/bolt-holes/locks is not possible due to the worn nature of the sockets.

[61] Xenophon *Oeconomicus* III.4 indicates that the chaining of household slaves on a wealthy individual's estate was at least one means of control. Fisher 1993: 51 fig.7 for iron shackles found in Lavrion (*cf.* Diodorus Siculus III.12.3 on the chains of gold mine slaves in Egypt).

equipment, skilled labour and valuable commodity products which would be protected jealously from opportunistic looting or more systematic encroachment.[62]

An internal lock may also suggest a residential or refuge function (although of course a watchman looking after a store might also use an internal lock). The majority of Siphnian towers (possessing a ground floor internal area 20-50m^2) might contain a nominal 40-150m^2 internal space according to the presence of one or two upper storeys. It is worth noting that only a large, multi-storey tower such as Ayios Petros on Andros (20m height), with a combined internal surface area of approximately 250 m^2 would bear comparison to the ground-floor surface area of a rural, domestic building such as the Vari House (243 m^2).[63] Adopting Postgate's nominal estimate of 4-7 m^2 living space per person would suggest that the hypothetical tower 'population' of many Siphnian towers might exceed a dozen (although such a nominal estimate ignores provision of *storage* space).[64] However, although descriptions of tower houses from more recent, historical times, can suggest a residential function, the importance of the *aule* (courtyard) and *oikia* (house) in domestic housing of Classical Greece would make it unlikely that these structures served as the residence for free members of the *oikos*.[65]

Ultimately, rather than speculate on hypothetical residential potential, it is perhaps more significant to emphasise the strongly built, horizontally partitioned area at ground level, and the secure, and potentially lockable, external door threshold. The partitioned ordering of internal architectural space indicates exclusivity of access, not only into towers from the main entrance, but also *within* towers themselves.

ORIENTATION

In regard to questions of residence, the south facing orientation of several prominent island towers has been proposed as an indicator of permanent habitation.[66] The recommendation of Xenophon (though probably referring to the *portico* of a domestic complex) is usually cited to support this hypothesis,

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[62] Pomeroy 1997: 31-33 for the importance of domestic storage.

[63] Estimated internal surface area of Ayios Petros (Andros), see Haselberger 1983: 100. For surface areas of buildings in the Attic countryside, see Lauter 1980: 281; Lohmann 1993a: 184 table 9.

[64] Postgate 1994: 53, 61-62.

[65] Rodd 1892: 55; Miller 1905: 218-221 for tower houses in the Mani.

[66] Young 1956a: 135-6 on Attika, though note north-western orientation of Golden Pig Tower (Young 1956a: 127 fig.3; Photos-Jones & Jones 1994: 314 fig.1), a feature which may be connected to its function as part of an ore washing complex (see *Fig.6.9c*). Haselberger 1978b: 148-9; 1983: 121-2 on the southerly orientation of Ayios Petros (Andros), Kheimarrou tower (Naxos), Ayia Marina (Keos). For domestic building orientation, see Hoepfner & Schwander 1994: 318-20.

> καὶ σύμπασαν δὲ τὴν οἰκίαν ἐπέδειξα αὐτῇ ὅτι πρὸς μεσημβρίαν ἀναπέπταται, ὥστε εὔδηλον εἶναι, ὅτι χειμῶνος μὲν εὐήλιός ἐστι, τοῦ δὲ θέρους εὔσκιος.
> Xenophon *Oeconomicus* IX.4.
>
> And I showed her that the whole house faced southwards, so that it is quite clear that in winter it is sunny and in summer shady.

Thirty five Siphnian tower entrances are either extant or, where the threshold is missing, may be inferred from gaps in otherwise continuous circumferences (the presence of a staircase may also indicate the approximate orientation of an entrance where a section of the circumference is destroyed).[67] Where circumferences are fully preserved, there is unanimous evidence for ground-floor entrances, although this would not necessarily preclude the presence of another upper-storey entrance, as featured in some well-preserved examples elsewhere in the Aegean.[68]

There appears to have been a strong preference for a southerly entrance orientation, with only six of the known entrances likely positioned to the north of the east-west axis (*Figs.4.6,4.8*). This choice of orientation is especially common in the north and west of the island; unfortunately the orientation of tower entrances in the south is less well known, although most of those which are extant do not contradict the pattern elsewhere in the island.[69] Although the predominant SE-SW orientation corresponds to sunlight hours, and provided greatest shelter from northerly winds,[70] this does not necessarily *prove* residential habitation of the towers.[71] The southerly and westerly slope aspect of many tower locations (*Figs.4.7, 4.9*), combined with the fact that towers tended to face downhill onto associated structures mean that entrance orientation is also attributable to these two important locational factors.[72]

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[67] The entrance of **26** probably located in the south-east, where there is a 1m gap in the circumference. The entrance to **52** was located in the destroyed eastern section, from the corbelled staircase ascending anti-clockwise in the north.

[68] e.g. Fanari round tower on Ikaria (Papalas 1992: 93-7 and below Appendix 2.7), Lykian quadrangular towers (Konecny 1993 fig.7 and below Appendix 3.7). For medieval, mortared towers with first- or second-floor entrances, see Lock 1986: 105-6. At the well-preserved tower of Ayios Petros on Andros it is noticeable that three separate jamb-lintel structures were constructed, one to a vaulted ground-floor, a second at the first-floor and a third at the third-floor (Haselberger 1983: 69-72). It is possible the upper storey gaps were merely windows, but ethnographic evidence (e.g. Rodd 1892: 72 on Maniote tower-houses) at least admits the possibility that they might be used as entrances. The arrangement of the stone staircase within the tower enabled a tripartite vertical division, while the use of ladders to reach the upper entrances would effectively seal the ground-floor from the rest of the tower

[69] **8**, **23**, **47** may have featured northerly entrances from the evidence of their partially destroyed circumferences, but this number would not substantially alter the overall argument.

[70] In exposed areas on the eastern side protection from the coastal wind might be sought in a westerly orientation (**14**, **38**), although a north-easterly orientation was not unknown (**29**).

[71] For the archaeology of architectural orientation, Parker Pearson & Richards 1994b: 14-18; Parker Pearson, Sharples, Mulville 1996: 61.

[72] The entrances of towers **10**, **21**, **33**, **53** faced *across* (rather than down) the adjacent slope; in valleys running north-south (**8**, **10**, **11**, **16**, **20**, **45**) a westerly aspect appears to have been preferred. For the relation of adjoining and adjacent structures to towers, see p.150.

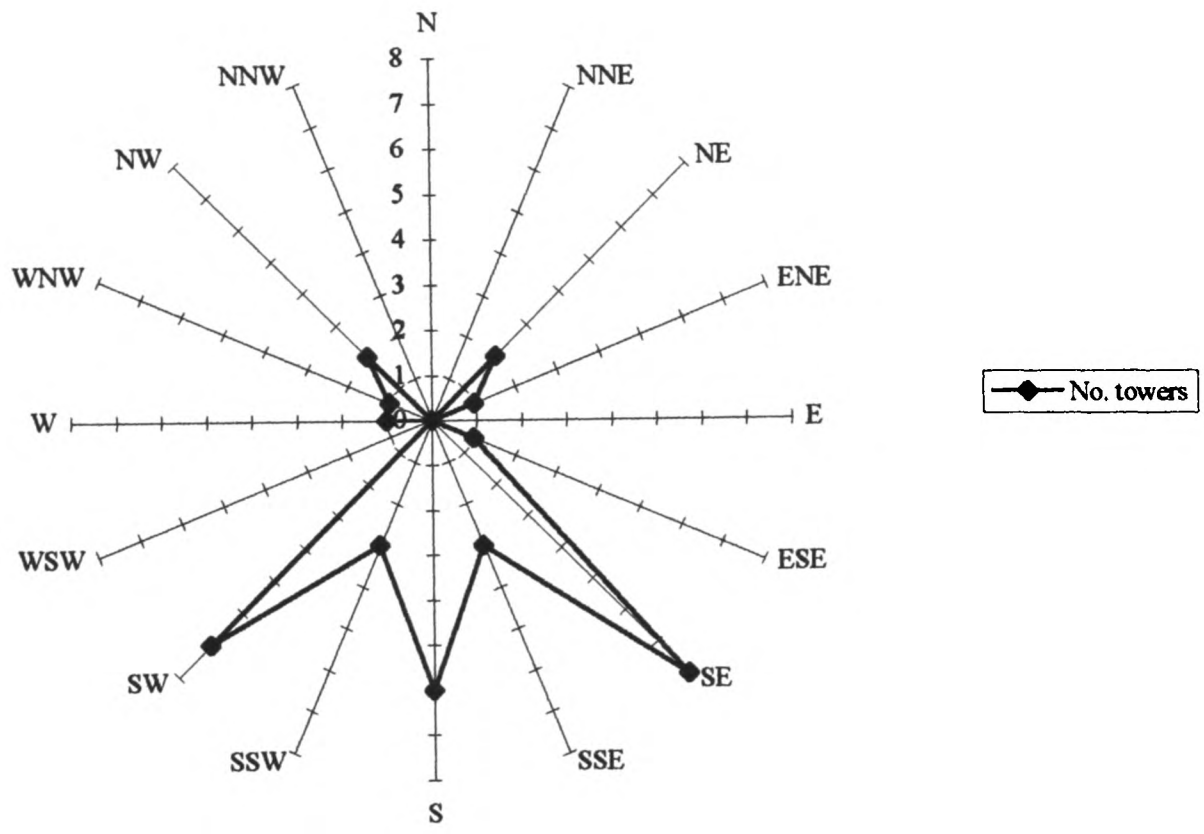

FIG.4.6: *Compass rose indicating orientation of 35 known tower entrances (20 n/a) which illustrates strong preference for SE-SW entrance orientation.*

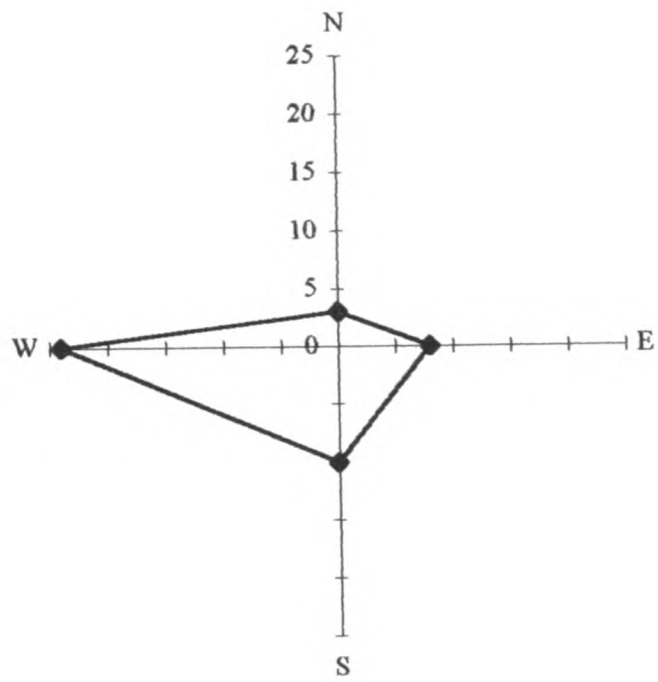

FIG.4.7: *Compass rose indicating slope aspect of tower locations. 24 towers face westerly aspect.*

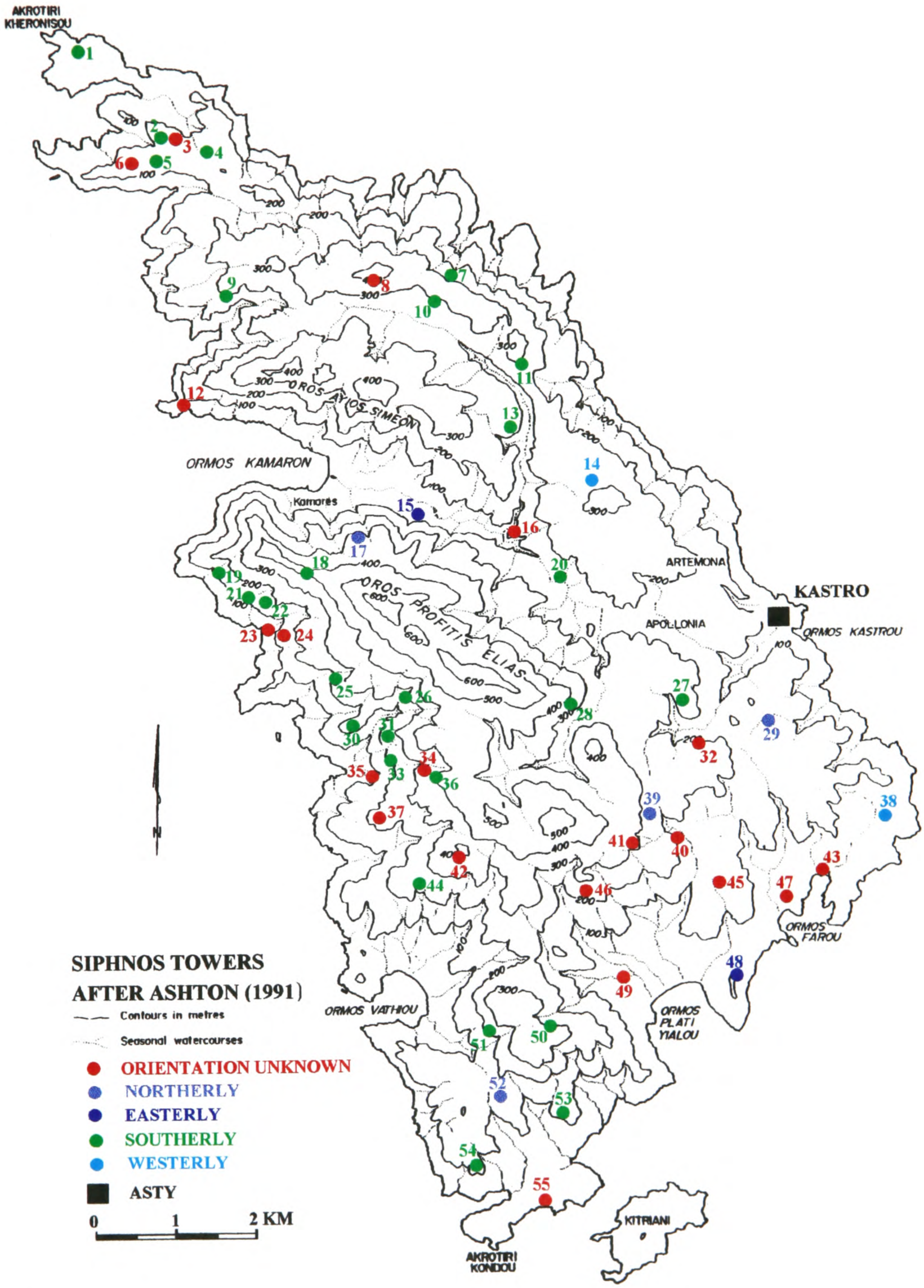

FIG.4.8: *Map of Siphnos towers indicating orientation of entrances, with majority facing a southerly aspect.*

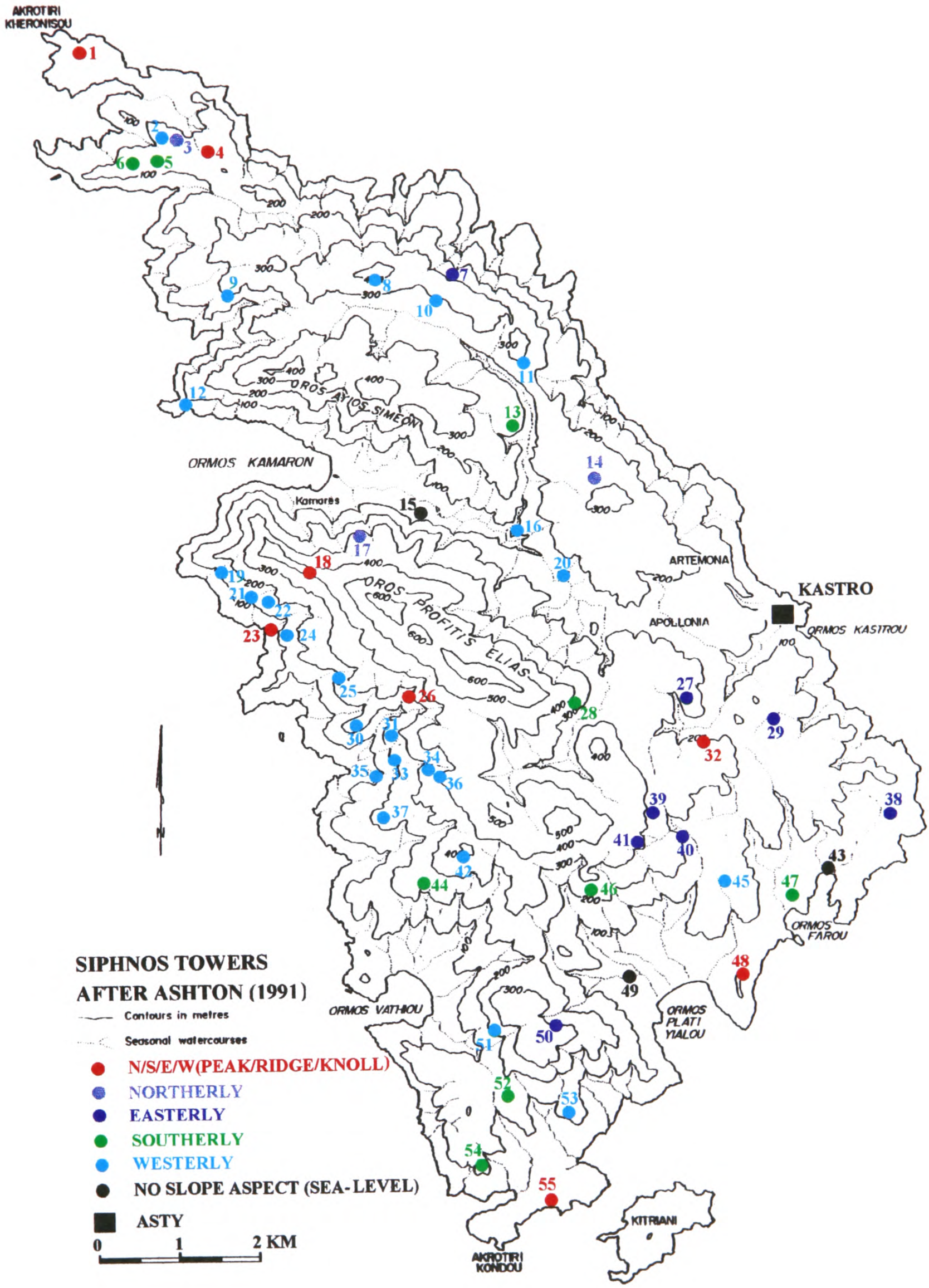

FIG.4.9: *Map of Siphnos indicating slope aspect of tower locations: predominant westerly aspect.*

ADJOINING AND ADJACENT STRUCTURES

Several types of adjoining or adjacent stone structure including walls, buildings, wells and cisterns are visible at over 30 tower sites (*Table 4.6*, *Fig.4.10*), although the area surveyed around a tower may not record all additional structures.[73] In addition, the effects of post-antique destruction and alteration mean that some stone walls, together with any contemporary mud brick or wooden structures, may have been rendered invisible over time, while others may only be recoverable through excavation of the tower site.[74] Therefore it is probably unwise to seek much significance in a distinction between 'stand-alone' towers and those which appear associated with a larger site, but rather to examine the surviving arrangements to establish any general patterns in the archaeological record.[75]

Earth-fill, which might bury ground-floor entrances, masonry and obscure any adjacent structures, is not a serious problem at Siphnian tower sites on Siphnos: only **10**, **11**, **27**, **28** are partially affected but even there site visibility generally remains good. From the current level of tower entrances — *in situ* threshold slabs usually at ground level — deposition does not appear to have concealed foundation levels at the majority of sites. Minor obscuring problems at sites on the island do not tend to be caused by soil fill, but rather by scrub undergrowth, which hinders precise examination of adjacent features at some sites (**2**, **6**, **10**, **11**, **19**, **21**, **22**, **25**, **28**), but the basic size and ground plan of structures can usually be determined.[76]

The size of site ranges considerably (qualified by the observations on site visibility above), from a few square metres, to walls, platforms and rooms occupying several hundred square metres (e.g. **3, 25, 53**), to scattered buildings, walls and cisterns (**23**, **24**) spread over a hectare or more (*Table 4.7*). Most sites occupy an area less than 1000m^2 (0.1 ha.), but it should be remembered that estimates are based only on currently visible material, and that in some cases (e.g. **13**) the exact length of adjoining walls may have extended considerably further.[77] In comparison, survey of

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[73] Without intensive survey, reconnaissance of tower sites is based upon individual field study and inevitably cannot be as comprehensive in survey or as extensive in area covered. The author covered a radius of approximately 50m around towers visited. For example of this problem elsewhere, traces of buildings around Tower F in the Megarid (missed by Tillyard 1905-6, Hammond 1954) have only recently been recorded (Muller 1982: 393-7; Munn 1983: 338-344).

[74] See above p.94f. For examples of adjacent buildings revealed by excavation at several tower sites on Lefkas, see Dousougli & Morris 1994: 216-217, figs. 4-8 (Appendix 2.4 below).

[75] The lack of space at certain cramped tower locations on ledges and cliff faces (**18**, **26**, **50**) might provide additional weight of argument for stand-alone structures at these sites.

[76] *viz.* Rackham & Moody 1996: 6 note the generally good archaeological visibility on limestone formations.

[77] It is due to this variability that sites sizes in *Table 4.7* are generally differentiated on a logarithmic scale, according to 100m^2, 1000m^2 (0.1 ha) and 10,000m^2 (1 ha.) respectively (following definitions of 'site size' in Cherry, Davis, Mantzourani, Whitelaw 1991: 18-20; Jameson, Runnels, Van Andel 1994: 248-257, 417). For the importance of site size for interpretation of function, see Catling 1984: 100, Kramer 1994: 207. Thus Osborne 1996b: 167, 'Site size is crucial to understanding the historical importance of activity in the countryside both because it is integral to

isolated rural structures in southern Attika also indicates a site range from less than 1000m^2 (0.1 ha) to 4,000m^2 (0.4 ha).[78]

WALLS

The most common stone structures found at tower sites are double block walls, 0.6-0.75m thick,[79] identical in masonry arrangement to the towers (i.e. ancient courses, not re-used material), which may extend in a single direction running in parallel on either side of a tower (**28**), abut the tower at right angles (**25**), extend in the manner of spokes in a number of directions (**13**), 'zigzag' (**37**) or be hooked in the manner of a fold (**21, 52, 54**), i.e. adjoining, enclosure walls which differ in plan from regular courtyard walls (see below).[80] Walls may be preserved to a height of over 2m, effectively forming a platform below the tower (**23**, **25**, **45**) comparable to tower plans on other islands.[81] In two cases (**23**, **25**) the length of platform may be traced for more than 20m.

In the cases of **13**, **22**, **55**, remains of structures associated with agricultural processing — presses and a threshing floor respectively — have been interpreted adjacent to the towers (*Table 4.9*, *Fig.4.11*).[82]

COURTYARDS

Evidence for surrounding, quadrangular courtyards in the manner preserved at some island and mainland towers is generally lacking.[83] Of reported courtyards, the dimensions of the wall structure at **19** indicate that it was a small enclosure (*Pl.19.2*),[84] possibly a fold consistent with the arrangement of walls at **21**. It is possible that the adjoining 'courtyard' walls identified at **47** were

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interpretations of site function and because the proportion of the population for whom the country rather than the town is a base is, arguably, an important indicator of the social and/or economic dominance of the town.' However, N.B. Cherry, Davis, Mantzourani, Whitelaw 1991: 34 n.34, 'Size hierarchy and settlement hierarchy are not equivalent: the former is a purely empirical archaeological construct that is generally presumed to reflect the latter, if only imperfectly.' Schwartz & Falconer 1994b: 2 on the limited extent to which ancient settlement hierarchies may be estimated by the criterion of relative site size.

[78] Lohmann 1993a: 184 table 9.

[79] Preziosi 1994: 64.

[80] At other sites, the antiquity of adjoining or adjacent walls is less clear, especially where there has been demonstrable post-antique settlement (e.g. **37**, **44**). Masonry similar in worked shape to the tower may be located in the bottom of rubble walls (*Pl.44.1, 52.3*), suggesting re-use of original masonry in construction.

[81] Comparable to **25** is the plan and cross-section of Trypiti tower, Thasos (Osborne 1986 Appendix no.23) in Baker-Penoyre 1909 pl.17.

[82] See Ch.6 below for discussion of agriculture at rural sites.

[83] Rectangular courtyards over 400m^2 at island towers of Ayia Triadha, Amorgos (Ross 1843: 43); Fanari, Ikaria (Papalas 1992: 93-97); Kheimarrou, Naxos (Haselberger 1972: 432); Mavragni, Peparethos (Friedrich 1906a: 125). On the mainland, Megarid Tower F (Hammond 1954: 108). On courtyards generally, see Haselberger 1978a: 366.

[84] According to Young 1956b: 53 a wall ran 8m south from the doorway then turned. If the wall was to adjoin the tower in a courtyard, the enclosed area would encompass perhaps 8m x 8m. The existence of the wall is difficult to verify (Ashton 1991: 74) due to undergrowth.

No.	kms from coast	Distance (kms) from asty	Slope Aspect	Entrance orient.	ADJOINING/ADJACENT STRUCTURES	Current visible size
23	0.1	6.5	N/E/S/W	-	adjacent buildings, wall foundations, platform wall, cistern	~1ha.
24	0.3	6.5	W	-	adjacent walls, scattered building complexes below	~1ha.
30	0.5	5.5	W	S	adjacent buildings, mandra, cistern nearby	5,000m^2
53	0.6	7	W	S	adjoining wall, building complex, platform	1000m^2
31	0.6	5.5	W	SW	adjacent buildings, mine adit and wall 50m from tower	300m^2
21	0.3	7	W	S	adjoining walls; enclosure and cistern 20m north	300m^2
55	0.2	8	S	-	adjacent building foundations, cistern, ancient road ?	250m^2
37	0.7	6	W	-	adjoining walls; abandoned village site (Mavro Khorio)	200m^2 (Mavro Khorio = 1ha.)
17	0.8	5.5	N	NW	adjacent buildings, cisterns	200m^2
41	1.8	3.5	E	-	adjacent enclosure	200m^2
44	1.1	6	S	SE	adjacent walls, (later ?) buildings	200m^2
54	0.4	8	S	SE	adjoining wall, cistern nearby; adjacent building	200m^2
9	0.4	8	W	SSW	adjoining walls, adjacent buildings, cisterns adjacent + 40m n/e	200m^2
25	0.5	6	W	SW	adjoining walls, adjacent buildings, platform	200m^2
33	0.6	5.5	W	SE	adjacent walls	150m^2
48	0.2	4.5	N/E/S/W	ESE	adjacent walls, (graves?) to south	150m^2
28	2.9	3	S	SE	adjoining walls	150m^2
8	1.1	6.5	W	-	adjoining walls, adjacent buildings, cistern, mine gallery	150m^2
2	0.5	9.5	W	SW	adjacent walls	100m^2
6	0.3	10	S	-	adjoining walls	100m^2
13	1.3	4	S	SE	adjoining walls	100m^2
52	1.2	7	S	NE ?	adjoining walls, adjacent (ancient ?) buildings, well	100m^2
35	0.3	6	W	-	adjacent (modern) buildings, cistern	<100m^2
32	1.7	2	N/E/S/W	-	adjacent cistern	<100m^2
42	1.4	5	W	-	adjacent cistern	<100m^2
47	0.2	3.5	S	-	adjacent walls	<100m^2
5	0.4	9.5	S	SSE	adjacent walls	<100m^2
19	0.2	7	W	SSE	adjacent walls	<100m^2
49	0.4	5.5	no aspect	-	adjacent walls	<100m^2
10	0.9	6	W	S	adjoining (later ?) walls	<100m^2
45	0.8	3.5	W	-	adjoining walls	<100m^2
36	1.1	5	W	S	cistern	<100m^2

TABLE 4.6: *Siphnos towers with known adjoining/adjacent structures, sorted according to current visible site size. Data from Ashton 1991, Preziosi 1994 and fieldwork.*

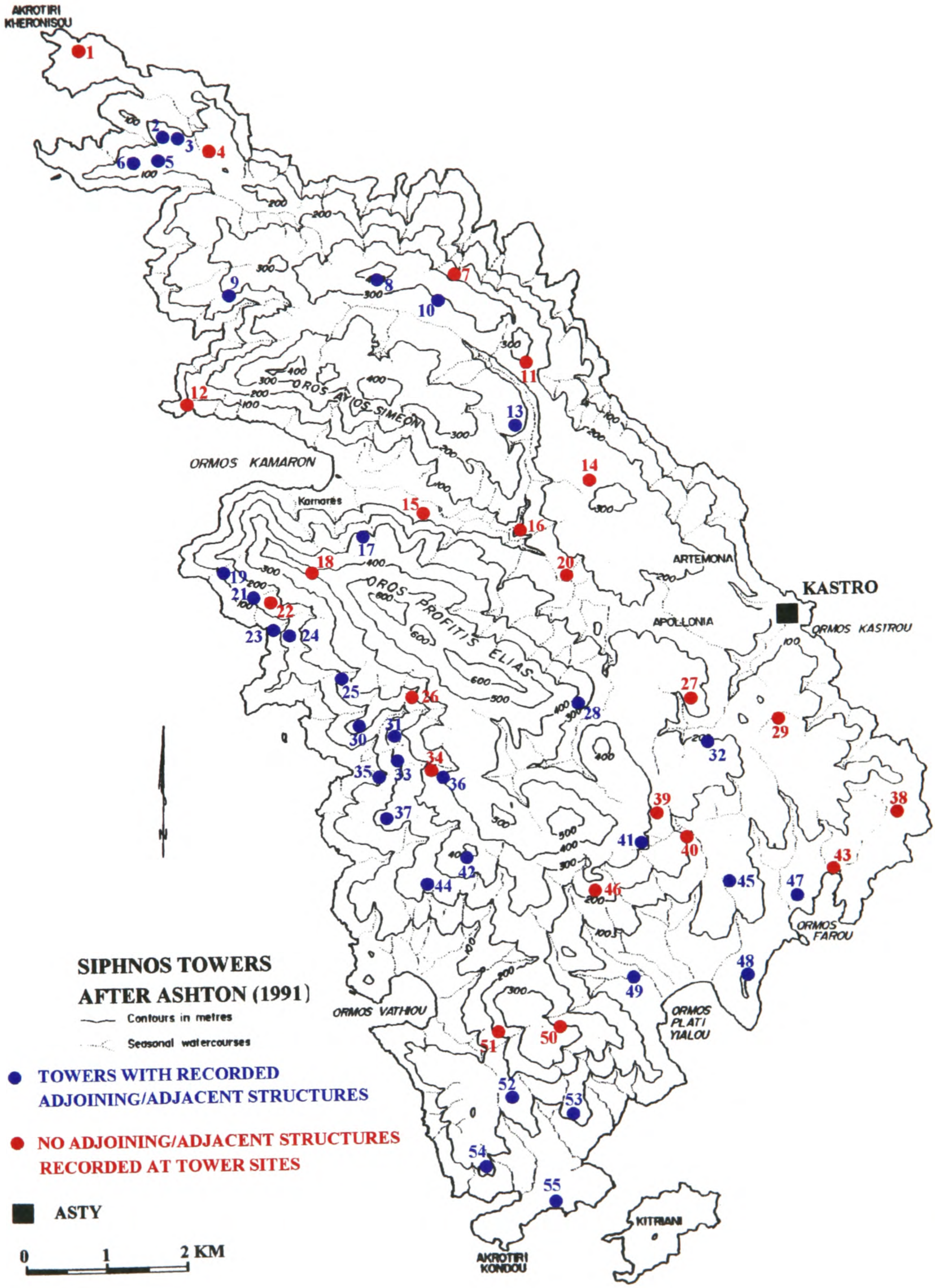

FIG.4.10: *Map of Siphnian towers indicating sites with known adjoining/adjacent structures.*

TOWER	NO. OF ROOMS	AREA OF BUILDINGS	DISTANCE FROM TOWER
3	10+	70m x 50m	adjacent
53	10+	35m x 25m	10m
25	6+	12m x 12m	adjacent
24	4+	12m x 12m	10m+
8	4+	15m x 9m	adjacent
9	3+	10m x 10m	10m
23	2+	10m x 10m	20m
17	2	12 x 11m	5m
52	2+	9m x 4m	adjacent
54	2	8m x 5m	5m
31	2	7m x 6m	20m
30	2	5m x 3m	10m
45	1+	5m x 5m	adjacent
37	1+	5m x 3m	5m
44	?	?	adjacent

TABLE 4.7: *Identifiable building complexes at Siphnian tower sites in descending order of size.*

TOWER	INT/EXT	DEVICE	SHAPE	INTERIOR	LENGTH x WIDTH/ DIAMETER (m)	DEPTH (m)	CAPACITY Litres	DISTANCE FROM TOWER
17	EXT	CISTERN	O	plaster	6.5	~1	33,000	30m
48	INT	CISTERN	□	stone	4 x 4	2.2	32,000	internal
55	EXT	CISTERN	□	stone	4.5 x 1.5	3	20,000	25m
17	EXT	CISTERN	O	plaster	4.8	~1.5	~18,000	adjoining
9	EXT	CISTERN	O	plaster	3.5	~1	~10,000	10m
8	EXT	CISTERN	□	stone	4 x 2.5	~1	~10,000	10m
54	EXT	CISTERN	O	stone	2.9	1	7,000	11m
35	EXT	CISTERN	O	stone	2	2	6,000	20m
23	EXT	CISTERN	O	plaster	2	1.3	3,000	15m
37	EXT	CISTERN	□	plaster	2 x 1	~1	2,000	5m
32	EXT	CISTERN	□	stone	1.6 x 1.2	0.5	960	15m
21	EXT	CISTERN	O	stone	1	~1	800	20m
36	EXT	CISTERN	O	stone	1	~1	800	15m
9	EXT	CISTERN	O	plaster	1	~1	~800	40m
42	EXT	CISTERN	□	stone	1 x 1	0.5	500	40m
30	EXT	CISTERN	□	stone	0.8 x 0.5	0.5	200	50m
52	EXT	WELL	O	stone	1	?	?	20m
3	EXT	WELL	O	stone	~1	?	?	5m
24	INT	WELL	□	stone	1 x 1	?	?	internal

TABLE 4.8: *Man-made water collection devices at Siphnian tower sites in descending order of size.*

Tower	IMPLEMENTS, VESSELS, STRUCTURES	LOCATION	REFERENCES
11	stone block 1.9 x 0.7m with hollowed depression - grinding basin ?	inside	Young 1956b: 52; Ashton 1991: 58-9
13	'a sunken horseshoe-shaped structure 2.5m long'	adjacent	Young 1956b: 52
22	limestone blocks with hollowed depression - wine (?) press	adjacent	Young 1956b: 53, pl.39 Fig.3; Ashton 1991: 80-1
23	(Archaic) stone basin	adjacent	Ashton 1991: 82-3
29	stone press block with run-off channel (olive press ?)	entrance	Ashton 1991: 94-5
48	stone press with run-off channel, stone jar, hand mills	inside	Dragatsis 1920: 150-4; Young 1956b: 54-5; Ashton 1991: 132-5
55	semi-circular stone platform (threshing-floor ?)	adjacent	Young 1956b: 55

TABLE 4.9: *Implements, vessels and structures associated with agricultural activity.*

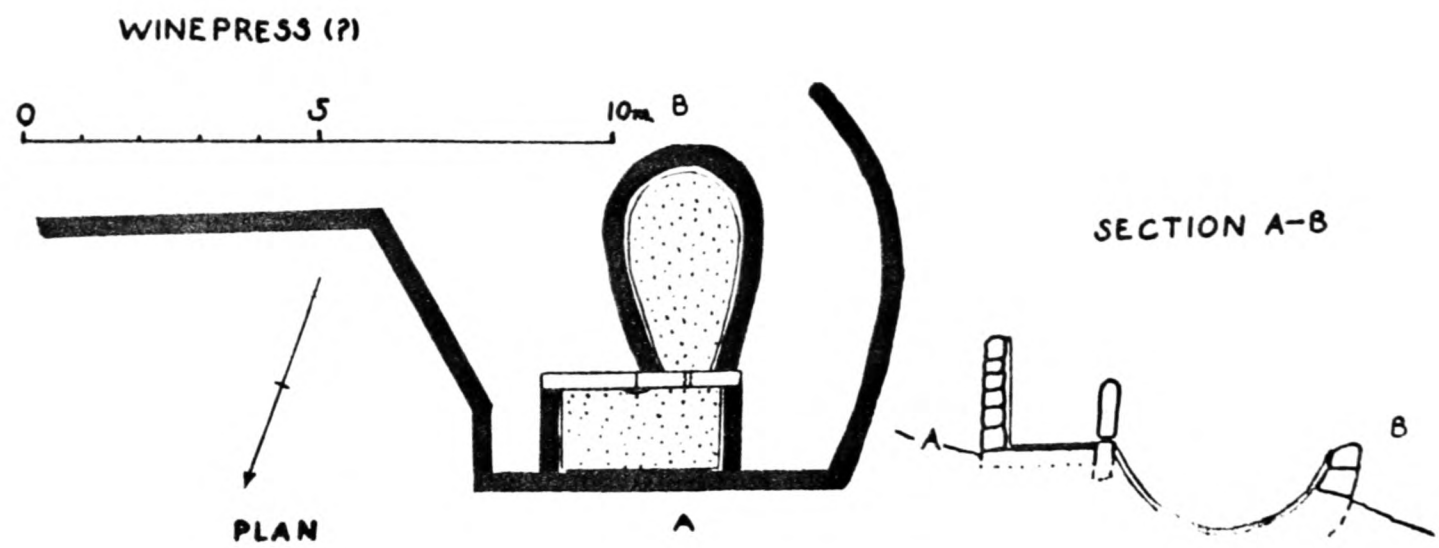

Fig. 3. Siphnos: Structures near three of the towers

FIG. 4.11: *Adjacent press structure at* **22** *('Wine Press') after Young 1956b fig.3.*

modern field walls which adjoin the tower in a rectangular shape and appear to incorporate quantities of tower masonry (*Pl.47.2*): no trace survives today of an ancient courtyard.[85] If a courtyard was originally situated there it would be an unusual arrangement, because wherever inter-connected complexes of walling occur at Siphnos tower sites, they always stand below and apart from the tower itself (**23**, **25**), sometimes at a distance of up to 20m (**31**, **53**).[86]

BUILDINGS

At several sites foundation walls form recognisable building plans adjacent and below towers (*Table 4.7, Appendix 1.4*). A contemporary date between outbuildings and a tower can be demonstrated through identical masonry style in the lower bonding courses of connecting walls which link a tower to the buildings (e.g. the pseudo-isodomic masonry employed in outbuildings and platform at **25**). The style of entrance in some buildings may also indicate a contemporary, antique date (e.g. door jambs at **8**, **31**).[87]

WELLS AND CISTERNS

Nearly all towers on Siphnos are located near some kind of seasonal water course, and some have the advantage of a more permanent natural water source such as a spring (**32**, **39**, **51**) or hollow (**5**). However, man-made water collection devices (predominantly cisterns) are present in the vicinity of several towers (*Table 4.8*), and in two cases may be identified within tower structures themselves (**48**, **24**).[88] They provide another means of supplying water (for human and animal consumption, if not for irrigation) at rural sites, although they may be subject to evaporation during the summer months unless covered.[89] Even though the water is less fresh, due to storage from the rainy months of winter through the dry summer period, it is usually potable. Large cisterns can store substantial volumes of water, depending on rainfall and catchment area (most Siphnian cisterns are located on slopes which could collect rainfall run-off).

The difficulty of dating such structures, and in particular establishing contemporary use with a local tower, is a common problem in the archaeology of rural sites.[90] However, the alignment of

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[85] Ross 1840: 146; Ashton 1991: 130-1; personal observation Oct. 1995.

[86] Discussion in Preziosi 1994: 62-3. See also Osborne 1986: 169 on the small number of extant Thasian tower courtyards. Two of the best preserved are located in the south of the island at Kaminorokhaïko (Osborne 1986 no.11) and Avatsinia (Osborne 1986 no.6). See Brunet 1988a: 170-199 and below Appendix 2.6.

[87] Outbuilding door-jambs extant at **8** (Preziosi 1994: 64-5); **31** (Ashton 1991: 98-9; Preziosi 1994: 66-7).

[88] Ashton 1991: 84-5 for well at **24**. Hohmann 1983: 30-7 for large double chambered cistern at **48**. It is likely that the recorded number does not represent the full extent of water collection devices at tower sites, as they can be hard to identify among branches of undergrowth (sometimes deliberately placed there by shepherds to prevent animals falling in).

[89] Livet 1962: 208-210, 233-234; Leveau 1984a: 422.

[90] Hammond 1954: 111.

cisterns or wells with adjoining or adjacent buildings (**8**, **9**, **21**, **23**) often suggests that they may have been part of the original tower site plan. Rock-lined cisterns are usually constructed in excess of 1m diameter (where round) or length/width (where quadrangular), and 1m metre in depth. The capacities, which range from several hundred to tens of thousands of litres bear close comparison to devices at Megarid tower sites and domestic cisterns excavated at Olynthos and in Athens, and are in marked contrast to the 'industrial' cisterns of the Laurion silver processing complexes.[91]

The existence of a cistern does not necessarily prove permanent habitation of a particular site: the size of some devices at Siphnian rural sites might barely support the needs of an individual (in the case of devices less than 1000 litres) while others had capacities nominally sufficient for more than 10 people on a permanent basis.[92] It does, however, suggest provision for significant water demand at these sites (even if only on a seasonal basis), especially where other natural water sources might be available within a short distance due to the hydrology of the island (*Fig.2.4*).

CONCLUSIONS: COST OF CONSTRUCTION

Estimates for the 'cost' of individual tower construction are inevitably approximate. Although sums for monumental construction are recorded in some epigraphic documents, they are not 'price' statistics in the modern sense,[93] and so an estimate in ancient monetary terms does not seem appropriate, especially since there were many other variable contributory factors, such as the type of labour (e.g. free or slave) used, and the 'expense' of transport and other capital (such as wooden doors, frames and other 'movable property' considered part of the structure).[94]

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[91] Ober 1987b: 592-4 for an estimated volume of water (approximately 4,000-10,000 litres per year) which might be collected from water spouts in the upper courses of Megarid towers C and F . Robinson & Graham 1938: 307-309 for domestic cisterns at Olynthos, including a double chamber cistern, with each compartment 1m diameter, 4.5m and 5.7m deep respectively (*cf.* **48**). Thompson & Wycherley 1972: 176-177 for domestic cisterns within courtyards of Classical Athenian houses. Tölle-Kastenbein 1990: 106-114; Hoepfner & Schwander 1986: 20 for domestic cisterns in general. In contrast, industrial cisterns in the Laurion, might reach 20m in diameter (Conophagos & Badeka 1974; Conophagos 1982; Jones 1986b).

[92] Arguably 1-2 litres/person/day may be taken as an absolute minimum to support human habitation (Wagstaff & Gamble 1982: 100 for modern, higher figures of water consumption in excess of 20 litres/person/day). Crouch 1993: 26, 117, 243 on shape of cisterns, but no capacity estimates.

[93] *IG* XII 5, 872.48-55 (see above p.119) records prices of 2,400 dr. and 3,700 dr., which in each case included a quarter share of a tower among other properties. We do not know the individual price of the quarter share in each tower, although the sums paid by Telesikles and Artymakhos respectively are considerably more than the prices paid by others in the inscription for some fields and houses alone (e.g. 1678 dr. 3 obols for house and fields - line 16; 400 dr. for house, fields and marginal lands - lines 34-5; 1,400 dr. for house and field - lines 120-1). However, it may just be that larger land-holdings and more equipment were involved in these two cases (*cf.* 4,700 dr. paid in lines 55-6 for houses, tiles, *eschatiai* and water-courses; 750 dr. paid on behalf of a minor for a half share of property which included a tower - lines 61-2).

[94] Haselberger 1983: 47-48 gives a hypothetical estimate of over one talent for the cost of some of the tallest island towers (*cf.* Munn 1983: 77 n.99). Maier 1959 nos. 20, 56, 59; 1961: 66-8 on the cost of individual masonry blocks and the total sums involved in the building and repair of circuit wall towers at Eleusis, Kyzikos and Thasos respectively. The sums are typically in excess of 1,000 dr. for repair to an existing structure, and 7,000-9,000 dr. for construction.

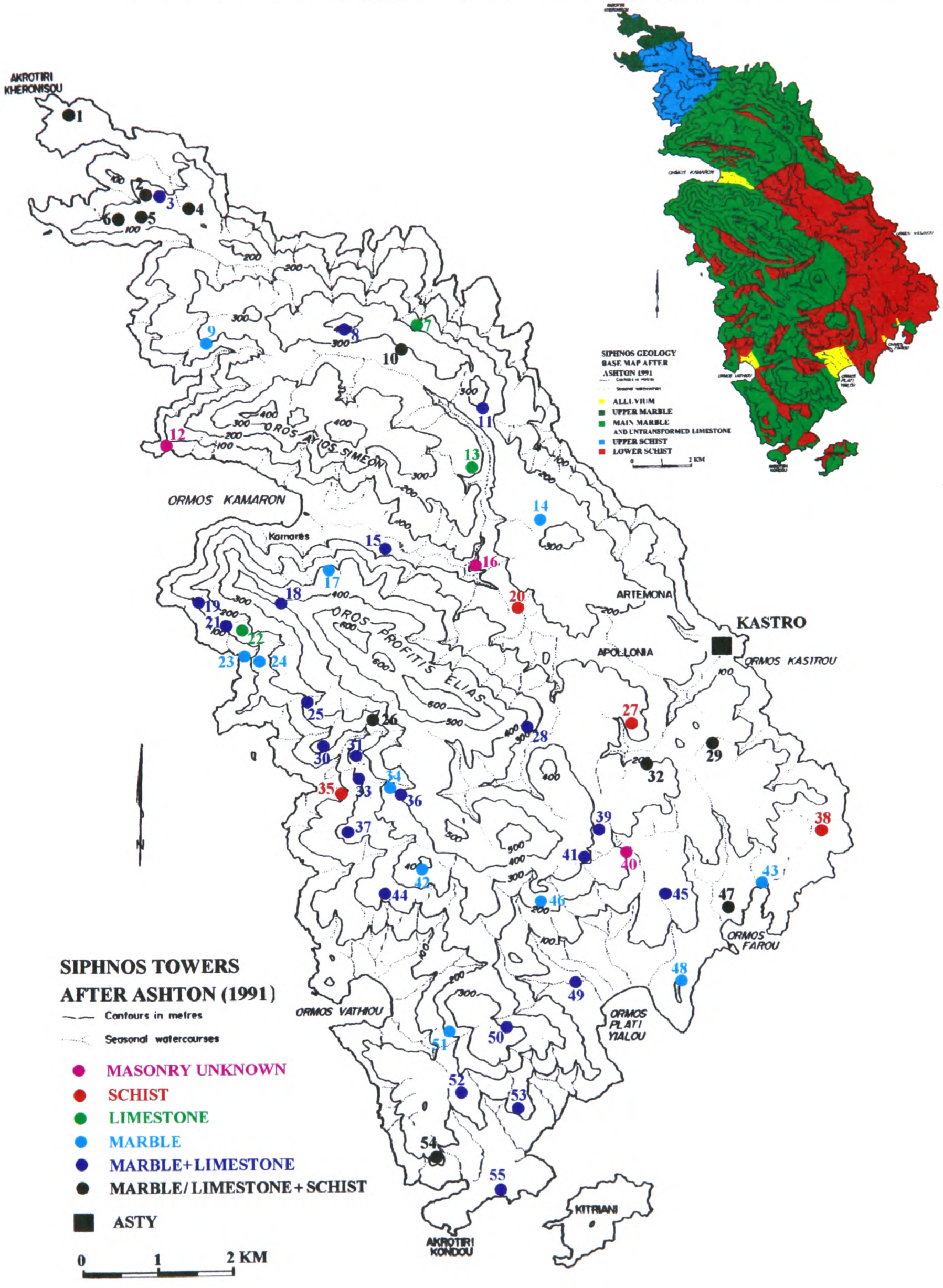

FIG.4.12: *Map of Siphnos towers indicating type of masonry used in construction, compared to geological distribution of stone. General close fit indicates local stone use.*

However, it is possible to suggest some parameters concerning the investment of labour and materials in these buildings provide an index of their socio-economic 'monumentality' within the rural landscape.[95] An estimate of labour investment is dependent upon two major factors: the quantity of masonry quarried, transported and worked, and the quality of masonry finish on individual blocks.[96]

A conservative estimate of cut masonry required for the majority of Siphnian towers (with circumferences measuring between 20-30m and walls approximately 0.8-1m thick), based on a height of ground floor plus a single storey (approximately 5-6m in total height) would amount to a figure in the order of $100m^3$ for inner and outer facing masonry, and more than $250m^3$ in the case of the largest plan structures.[97] The overall amount of effort to cut and transport this volume of masonry would also be dependent upon the distance stone was transported, and the size (and thus number) of individual blocks cut.

On the first point, it seems clear that the availability of local stone minimised transport of masonry: the distribution of stone material used in external masonry and internal wall lining closely fits the local geology of the island (*Fig.4.12*).[98] Schist is the main component of towers in the south-east (**20, 27, 29, 38**), with marble and limestone predominating in the west, although a mix of stone is also compatible with the banded nature of the limestone-marble-schist geology in the north and approximate east-west bands which run across the island (**2, 4, 5, 6, 26, 47**).

The dimensions of individual blocks vary from tower to tower, but outer facing blocks are usually 0.5-1m in length, 0.3-0.5m in height and width, with inner facing stones 0.3-0.5m in length, 0.2-0.4m in height and width.[99] Thus the outer facing circumference alone would require several

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[95] Meikle 1995: 174 warns against 'the assimilation of ancient behaviour and mentality to modern market behaviour and mentality' when dealing with the concept of 'investment', but as Luke 14: 28-30 indicates (see above p.124), towers might be exemplified as rational investment embedded within the society. In such a context, estimates of labour and materials are therefore justifiable.

[96] Despite claims (e.g. Lawrence 1979: 189) that plan shape was also a factor (namely that a round plan structure might be built more quickly than a rectangle), this hypothesis must be rejected with regard to Siphnian towers, where the quality of construction argues against a choice simply based upon expediency of available time.

[97] See Appendix 1.2 for estimates of individual tower masonry, based on a hypothetical maximum height (twice the diameter size) and a conservative working estimate of 6m height. The number of cut blocks estimated is a conservative figure, since it does not take into account the fact that blocks might diminish in size in the upper courses of pseudo-isodomic masonry. Camp 1991: 201 n.34 estimates that the Mazi tower (14.1m in height) required approximately 900 cut ashlar blocks, and for this reason ascribing a public, military function to the tower, rather than a private, domestic one. In crude volume of masonry, a tower of relatively modest size might exceed that of other highly visible monumental building such as a Tholos (e.g. Fastje 1972 for a Late Classical/Hellenistic Tholos on Paros, 3.7m external diameter, 4m in height; Lauter 1985: 43-8 for Lathuresa building). On woodwork in rural buildings (e.g. Thoukydides II.14.1), see Hanson 1983: 90-1 (*cf.* Schwander 1978: 108-112).

[98] For local stone use generally, Dworakowska 1975: 37. Osborne 1987: 91 (corrected by Brunet 1992: 45-6); Kozelj & Wurch-Kozelj 1989: 161-72 on the use of local marble (and occasional gneiss) masonry in Thasian towers (*cf.* Bakhuizen 1991: 74 on the proximity of quarries walls in Magnesia).

[99] The single largest block *in situ* is found on the south side of **42** (*Pl.42.1*), a roughly hewn block approximately 1.5m long, 0.8m thick and 0.6m high (Ashton 1991: 120-1).

hundred cut ashlar or trapezoid blocks for a nominal 6m tower.[100] It has been estimated that one dressed, quarry face limestone block 1m x 0.5m x 0.5m would require one man day's labour just to quarry work into shape.[101]

In addition, ethnographic data derived from time and motion studies of quarry workers in historical periods suggests that the amount of effort required to quarry, cut and raise masonry blocks into position in order to construct a nominal wall 25m long, 6m high and 0.6m wide of 360 marble/limestone ashlar blocks 1 x 0.5 x 0.5m can be estimated at least 1,500 days labour (over 75% of which required skilled mason and engineer labour): a very significant investment of skilled labour.[102] The actual process of raising and positioning blocks at Siphnian tower sites is unclear (there is no evidence of lifting 'knobs' on the masonry), but presumably scaffolding and a pulley system would have been required for the construction of upper courses.[103]

In addition, consideration of the quality of masonry construction can suggest the level of investment in these buildings. Although Siphnian towers are similar in architectural plan, variations exist in the size of plan diameter and lavishness of external decoration: the largest towers (generally situated in the south-east) also contain the most elaborate extant masonry work (**27**, **47**, **48**). Finishes (including broached, pointed and furrowed work, bevelled margins) are common around circumferences and doorways, indicating a degree of investment in decorative masonry work on structures located even in the extremities of the island.[104]

One of the most notable examples of decorative differentiation within this tradition are the 'arch' entrances at certain towers (**11**, **14**, **18**, **20**, **27**, **48**) (*Pl.11.1-2; 14.1; 20.1-2; 27.2; 48.2*), an architectural form which has been characterised as, 'a stylistic substitute in many utilitarian structures, and in less traditional types of buildings'.[105] It is important to note that such devices were not 'functional', in the sense that the spaces bridged by these 'arches' (usually comprising two springers and a keystone) could have been spanned by a horizontal lintel (as appeared the case at

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[100] See Appendix 1.2 for individual estimates for each tower.

[101] Lawrence 1979: 239.

[102] I would like to thank Janet Delaine for this data from an unpublished paper delivered at an Ancient Architecture seminar in Oxford, 1996. The labour estimates are based on figures from eighteenth-century AD Italian quarry workers. The labour estimate for marble/limestone is an absolute minimum estimate, as it is based on equivalent figures for volcanic tufa material; in fact limestone and marble material was probably at least twice as labour intensive (i.e. nearer 3,000 days labour for the nominal wall estimate).

[103] There is no evidence for the use of boss clamps on masonry blocks, as sometimes occurs in other towers of the Classical/Hellenistic period (Yener 1995: 94 fig.32 for boss clamps in Lykian towers).

[104] e.g. the bevelling found on the external masonry of **26** (Ashton 1991: 88-9) and the probable 'arch' entrance of **18** (Ashton 1991: 72-3), see Appendix 1.2. Several markings (A, Λ, O, XI, XO) appear on blocks in the Kheimarrou tower (Naxos), between the fifteenth and twenty-sixth courses (Haselberger 1983: 16-18). These have usually been interpreted as masons' letters (for different masons working on the same tower see above Ch.3 n.75), although they may also have served as aids for vertical alignment since markings in the twenty-sixth course (A) and fifteenth course (inverted A) are situated above the doorway.

[105] Boyd 1976: ii, 73; Lawrence 1996: 171. See above pp.101-106 and *Fig.3.6*.

other towers).[106] Unfortunately, the design of roof structures cannot be analysed; perhaps as a consequence of orderly abandonment, no substantial deposits of tile have been found (although the availability of clay would certainly have been the easiest option).[107]

The input of materials and labour required for this kind of rural construction has been advanced as a general argument for the public ownership of certain large and elaborate towers, but the literary and epigraphic evidence reviewed above (Ch.3) indicates that the construction of monumental rural edifices was not the exclusive preserve of the public domain: private individuals and groups might invest substantial amounts in rural structures such as towers.[108] Indeed, where prices of urban and rural properties appear side by side, it has been noted that, 'le capital immobilier urbain est très inférieur en valeur aux biens fonciers'.[109]

On the other hand, the labour 'cost' of these structures is one argument which has been put forward in favour of interpreting such rural sites as permanent rural residences rather than seasonal habitations or storage centres.[110] While the absence of archaeological evidence does not necessarily signify the absence of ancient structures at tower sites where no evidence has been reported, it is nonetheless pertinent to note that some of the largest recorded sites are located in some of the most distant locations from the *asty* (**3**, **23**, **24**, **53**, **55**), compounded by the additional difficulty of mountainous access in several cases.[111]

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[106] As Boyd 1976: 104 notes, 'The arch in the Greek world is therefore to be characterized *more as a stylistic substitute* than as a technological development.'

[107] Lodwick 1996: 30. Haselberger 1979 reconstructs tower roofs in the absence of tiles with a slanted rather than flat design.

[108] Koutsoukou & Kanellopoulos 1990: 169 suggest that the tower at Hellenikon-Choreza (Andros) was a public building on the basis of construction 'costs'. Likewise Konecny 1993: 53 on Lykian towers. However, against this view Hanson 1995: 17 argues that, 'Farmers, ancient and modern, manifest success mostly by building things; oddly, some scholars sometimes see intricate and impressive ancient rural infrastructure as a sign that the population therefore must have been doing something else !'. *cf.* Trump 1992: 199 on the number and size of Nuragic towers in Sardinia which suggests co-operative effort 'as the only way of explaining the scale of labor investment they imply.' Generally Lewis 1990: 246 on buildings works related to public property in the *polis*.

[109] Étienne 1985b: 57, 66 table 1 for prices of urban buildings in *IG* XII 5, 872.

[110] Jameson 1990b: 94-95, 'In some areas at some periods they [rural structures] appear to have been inhabited for weeks or months on end and not used solely to store equipment or produce, nor only for overnight shelter. The larger and more elaborate they were, the more likely it is that there was permanent occupation, if not by the adult male citizens of the city-state who had social roles (political, military, ritual) to play in the central town, then by members of their family or their dependent labor.' Also Lohmann 1992: 38. *cf.* ethnographic evidence (Newton 1865: 59) for seasonally habited, monumental rural buildings (the *Pyrgi* of Mytilene), 'The richer Greeks of Mytilene have country houses here [Morea], in which they pass their *villegiatura* in the summer. These country houses still retain the ancient name of *Pyrgi*, or towers. They are usually tall square houses, with a ground-floor which is only used for housing cattle and farming implements, and an upper storey generally consisting of a single room. Above this again is sometimes a third story. The entrance to the upper part of the house is sometimes by means of a flight of stone steps outside, sometimes by a wooden ladder inside the ground-floor. Some of the older *pyrgi* along the coast of Mytilene are strongly built with squared blocks.'

[111] Preziosi 1994: 64. Of note are the large complexes at **3** in the north, **23** & **24** in the west, **53**, **55** in the south-west. See also Brunet 1992: 47-8, reviewing evidence for courtyards at Thasian towers, which she argues is suggestive of a permanent habitation.

However, a rational 'value for cost' relationship between tower and owner is (as the introductory quote to this chapter suggests) perhaps an oversimplification based on modern attitudes towards residence: other, socially embedded dimensions of symbolic investment might also operate at community level.[112] Indeed, in order to investigate whether access to such structures fell within the public or private domain, and to assess questions of household, group and state activity more fully, it is necessary to relate the internal context of architectural space and the external context of site to the regional landscape.

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[112] Spencer 1995b: 35. *cf.* Munn 1983: 72 n.68, 'The landowner who chose to build a strong-room of these proportions was clearly saying something about what he had to protect when he spent his money so conspicuously.' Cherry, Davis, Mantzourani 1991b: 297, 'They [towers] nonetheless far exceed the strictly functional requirements of a structure designed for defense — whether of people or of agricultural land and whether against pirates or against individuals from one's own or from other city-states. These were deliberately monumental and conspicuous erections, requiring considerable amounts of time, labor and wealth....The conclusion must be that this evidence reveals a remarkable level of investment of disposable wealth in rural facilities.'

CHAPTER 5

SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE: LOCATION AND DISTRIBUTION OF RURAL SITES

> 'Location, therefore, and not structural detail or form, is the most important criterion for determining the original purpose of an isolated tower or tower-like structure. Fortunately, this is also the most immediately ascertainable fact about ancient remains, not dependent upon the chances of preservation or opportunities of excavation.'
> Munn 1983: 60

INTERPRETING LOCATION AND SITE USE

This chapter analyses the location of Siphnian monumental rural sites through several quantitative studies concerning their vertical elevation, coastal distance, intervisibility and nearest neighbour distance, ascertained by cartographic data and the results of an earlier Geographical Information Systems (GIS) study supplemented by corrective fieldwork.[1] These studies investigate multi-dimensional, spatial variations between rural sites (such as relative altitude, proximity and intervisibility) and enable hypotheses about rural site functions to be considered in relation to the archaeological record. They also contextualise individual sites within the larger regional landscape by considering their territorial position with regard to natural boundaries (such as the coast) and human territories (for example within the public domain of the *polis*, operating as part of a strategic network).[2]

The limitation of such analyses tends to be the adoption of a synchronic framework of study, in which locational factors affecting the construction of rural sites are assumed to remain constant, and in which the known distribution of sites is considered a representative, if not complete, record of the ancient landscape.[3] In attempting the following studies of spatial distribution, the dynamic, diachronic processes of monumental rural construction and the partiality of the regional archaeological record mean that — as with the micro-level archaeology of the individual site — adopting a longer-term chronological perspective may serve to indicate observable patterns at a

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[1] Wagstaff 1982: 112; Cherry, Davis, Mantzourani 1991b: 290; Preziosi 1994: 61; Brunet 1992: 48-9; Spencer 1995b: 37 on the importance of locational, inter-site analysis in the interpretation of rural site use.

[2] Ober 1985: 130-180, 1995: 93 n.4; Kallet-Marx 1989; Ashton 1991: 26-31; Gaffney & Stancic 1991: 12; Spencer 1995c: 37 (site 175) on the tower at Megalos Lakkos, Lesbos which appeared to overlook a strategic point of communication - the convergence of valleys *en route* to ancient *polis* of Eresos. *cf.* Bonzani 1992 on the importance of analysing distribution patterns of Nuragic towers on Sardinia in order to understand their social context) Territoriality here used in the sense of Sack 1986: 1-2, 'Territoriality in humans is best understood as a spatial strategy to affect, influence, or control resources and people, by controlling area; and, as a strategy, territoriality can be turned on and off.' Also Lohmann 1994: 251-253.

[3] Generally, Dawson 1975: 44; Wagstaff 1987b: 29-30. On this problem applied to rural sites, see Cherry, Davis, Mantzourani 1991b: 286; Jameson 1994: 56 n.4.

local level, which may be integrated with other kinds of *local* distribution patterns, from which a more general regional picture may ultimately be drawn.[4]

Thus, distribution analysis according to vertical elevation can indicate whether there is any noticeable preference for lowland or highland location, and can be integrated with data about slope aspect to evaluate hypotheses about strategic positioning of rural sites (e.g. watchtowers on mountain tops, ridges or knolls), based on their viewshed dominance of the landscape.

Measurement of coastal distance is a method commonly used to examine the potential influence of maritime factors on the location of rural sites.[5] As well as quantifying the accessibility of sites from the sea, results can be integrated with other locational factors, such as vertical elevation, prominence on an extremity of land, and viewshed, to assess the plausibility of their use in the 'public' domain as watchtowers, beacons, or refuge strongholds.

Intervisibility (as noted above in Ch.3) has often been assumed as a prerequisite of 'military' interpretations of site use, whether as strategic (border) defences or communication structures in a regional network which have been proposed for the territories of some ancient polities.[6] The problem in investigating such a phenomenon is the point at which intervisibility of rural sites may be interpreted as the result of an intentionally constructed 'strategic network', rather than a topographic coincidence of closely situated sites, which may not necessarily have been in contemporary use (for example in a densely exploited area of the countryside where temporal nuances between individual sites are now largely undetectable in the archaeological record).[7]

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[4] Goudie 1987: 24, *viz.* further analysis of local distribution patterns (such as availability of natural resources, slope gradient and land use) in Ch.6 below.

[5] e.g. Cherry, Davis, Mantzourani 1991b: 292 fig.13.7, who provide useful comparative tables of coastal distance for Amorgos, Keos, Siphnos and Thasos towers, although the Siphnian data in Ashton 1991 now supersedes their figures.

[6] Generally, Nowicka 1975: 31, 33. Winterberger 1892; Chandler 1926; Ober 1985: 6, 51 for later Classical defensive networks across the border areas of northern Attika. Harding 1988; 1990 *contra* Ober, argues that fortified sites in the Attic countryside were constructed on a local level as a measure against raiders, rather than as a fourth-century BC *polis* defence network. Mussche 1994b: 84-92, Vanhove 1994: 43-4 interpret the tower complexes of southern Attika as part of a coherent system of mine supervision. Van de Maele 1992 sees a Megarian border defence network incorporating the rural towers recorded there. Camp 1991: 195 rejects a primary signalling role for the (fourth?-century BC) Evangelistria tower between the ancient settlements of Livadia and Koroneia in Boiotia on account of its position, but notes its communication potential with other forts, and suggests that the tower may have been intentionally situated to overlook the ancient road which ran from Boiotia to Phokis, and may have guarded, if not actually delimited, the border between Koroneia and Livadia. See also Gauvin 1992 for the *poleis* of Kleonai and Phlious in the north-east Peloponnese. Kase, Szemler, Wilkie, Wallace 1991: 30 envisage a 'signal tower system' encompassing the Phokis-Doris corridor (but no *ethnos* power in charge of such a system is specified). Fossey 1992 argues for defensive networks in Boiotia, Phokis and Lokris, which expanded in the fourth-century BC but which may have initiated in the Archaic period. In general, see Garlan 1973: 154-160; 1974: 66-86; 1989: 93-114. Koder & Hild 1976 propose that some post-antique towers along the Kephissos valley in Boiotia and Phokis were part of a Byzantine defensive system. Lock 1986: 107 argues that this hypothesis does not account for towers situated outside the river valley.

[7] For the question of intervisibility applied to tower 'networks', Ormerod 1924b: 43-44; Ober 1985: 130-180, Lock 1986: 102; Kallet-Marx 1989; Camp 1991. For Siphnos in particular, Buchon 1911: 205 for an early hypothesis; Ashton 1991: 24-6.

Nonetheless, given the long-term durability of these monumental edifices, it may be assumed for the purposes of the study that such sites overlapped in their life-cycles, and indeed were clearly visible when other structures were built in the vicinity, thus allowing hypothetical intervisibility analysis to be applied.

However, since all towers (simply by their presence in the landscape) would have possessed a degree of 'defensibility' with regard to their immediate vicinity, it is not enough to assume a 'public' function for a rural site just because it was located in a particularly prominent location: in order to demonstrate that certain sites possessed a potentially determining 'strategic' function, locational information would have to exclude all other considerations (such as accessibility to natural resources and exploitable land). Conversely, the analysis can usefully discount a 'public' stragetic function in the case of unsuitably located sites (for example, where a nearby prominent viewshed has been eschewed).

GIS makes it possible to investigate potential local and regional group patterning: several case studies (including an analysis of Siphnian towers) have employed computerised mapping devices based on digitised map data to ascertain the degree to which towers may have been visually linked.[8] Although calculations must include parameters to take into account the effect which the height of structures might have upon their viewshed, and there may be errors if results are not checked in the field, GIS approaches can at least test hypotheses concerning the systematic construction of line-of-site, 'defensive' networks.[9] The large number of Siphnian towers distributed throughout the *chora* means that the analysis is not dependent upon a handful of data points, but can be calculated for over 2,500 points of intervisibility between extant towers.

Nearest neighbour analysis provides another kind of spatial examination which, by measuring the distance between neighbouring sites, can suggest patterns of clustering, and provide a nominal 'catchment area' around each site.[10] The distribution may be calculated according to 'crow-flies' distance on a map, or may estimate a more realistic walking path distance between the two points.[11] This latter estimate, although rather less precise in quantitative terms, and dependent upon first-

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[8] Ashton 1991: 32-6 for application of GIS to Siphnian tower intervisibility. General principles of GIS in Maguire, Goodchild & Rhind 1991. For its archaeological application see Allen, Green, Zubrow 1990. On the use of Digital Elevation Models (DEM) to assess intervisibility between ancient structures see Wheatley 1995 and critique in Llobera 1996. As Aldenderfer 1996: 16-17 notes, 'line of site analysis, therefore, may be more useful in circumstances in which direct historical analogy suggests that certain natural features have a clear articulation with some type of land use.'

[9] Corrections to Ashton 1991 intervisibility data in Preziosi 1994: 59-60.

[10] Whitelaw 1994 for nearest neighbour 'farm' sites in the Aegean. See Decourt 1990: 138-145, 1992 respectively for the uses and limits of nearest neighbour analysis applied to survey data from Boiotia and Thessaly. For general principles of nearest neighbour analysis, see Pinder & Witherick 1972: 277-288; Norton 1984: 114; Dawson 1975: 42 on the problems of definition and applicability of the model.

[11] Gaffney & Stancic 1991: 49-50.

hand knowledge of the localities, permits a more sophisticated appreciation of practical aspects of terrain and gradient encountered at ground level.[12] However, any absence in the overall site distribution pattern will of course inflate the nearest neighbour distance between sites, and therefore figures ought to be considered as a 'maximum' distance, which may be subject to revision if more rural sites are subsequently recorded. The usefulness of such analysis lies at the level of the *locale*, where architectural information may be integrated with intervisibility and nearest neighbour data to illuminate the local topographical context of a site.[13]

DISTRIBUTION OF RURAL SITES

ALTITUDE

Analysis of site location by height above sea level is relative to the total amount of land at that elevation, estimated here in nominal bands of 100 metres above sea level (masl) (*Table 5.1*). By dividing the number of towers situated in each band by the amount of land at that height, some comparison of the relative density of sites according to vertical elevation can be made. Towers are densest between an altitude of 300-400 masl (1 recorded tower/km^2 of land at that height), although the distribution between 100-200 masl, and 200-300 masl respectively exceeds 0.7 towers/km^2. Only above 400 masl does the density of towers fall below the equivalent of 1 tower for every 2 km^2, and although arguable that sites at this height stand a better chance of preservation, it is likely that this number of towers at high altitude is under-represented in the current total, due to the difficult nature of archaeological investigation in these areas.[14]

Indeed, the clearest conclusion to be drawn from the analysis is the extent to which such monumental sites are spread across the 'vertical' landscape, with the lower-middle slopes of steep mountainsides especially favoured.

COASTAL DISTANCE

In order to analyse the distribution of towers according to coastal distance, the number of towers within nominal 500 m distance bands was calculated as a ratio against the total amount of land situated at the same distance (*Table 5.2*). This analysis indicates that although 20 recorded towers (36%) are situated less than 0.5 km from the coast, the percentage of total land area within

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[12] Gaffney & Stancic 1991: 81 for an attempt to include features of terrain and gradient in estimated distances between rural sites (usually considered watchtowers on the sole basis of their intervisibility) on the island of Hvar (Zaninovic 1984; Kirigin & Popovic 1988).

[13] For the *locale* as an archaeological concept, see above p.29.

[14] Young 1956b generally failed to locate upland towers in his report and concentrated on structures at lower levels.

this distance is approximately 42%. In fact, the densest distribution of towers (in excess of 1 tower/km^2) occurs between 0.5-1.5 kms from the coast, where 27 towers have been recorded. The density of tower sites inland diminishes notably beyond 1.5 kms, although it is possible there may have been a coastal bias in the number of sites recorded, as has been suggested in the case of other islands.[15]

Certainly, such an analysis has implications for theories of site function connected with maritime defence, refuge or communication, for example where sites with outbuildings overlook an anchorage.[16] The only sites whose location close to the coast, and situation on a peak or knoll for wide viewshed (*Fig.4.9*) appears consistent with a maritime communication function (such as a beacon or a landing light) are **1**, situated on the northern tip of the island at the headland of Chersonesos, **12** on the northern side of Kamares bay.[17] The unsuitability of **43** (situated in the bay of Faros) as a lighthouse has long been recognised, and it is possible that it may have fulfilled other, 'public' functions if the bay at Faros was used as the main harbour for the island in antiquity.[18] The site at **23** appears too extensive to have functioned solely as a single beacon or marker, although its location and aspect over the anchorage of Vlasi would not exclude such a secondary use.

However, for the majority of towers, even those located close (<0.5km) to the sea, there is no necessary reason why they should be directly associated with maritime traffic.[19] Instead, it is perhaps more significant to note that the 'real time' walking distance between many coastal towers and overlooking bays is often considerable due to the steep gradients involved, even if the 'crow-flies' distance appears small. This often means, paradoxically, that in terms of 'real time' distance, rural sites situated further inland (such as those at low altitude in river valleys), and with no particular seaward viewshed, were more accessible from the coast than those situated on the steep

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[15] Osborne 1986: 167. In comparison to other island polities where rural sites have been analysed in relation to coastal distance, the distribution of Siphnian towers appear to fall on the 'inland' side of Thasian towers and the 'coastal' side of Keian and Lesbian towers, although a comparative ratio of towers/km^2 which takes into account the overall amount of land within each distance band would provide a more accurate guide. Cherry, Davis, Mantzourani 1991b: 292 fig.13.7 and now Mendoni 1994: 148 n.7 for the majority of known Keian towers located more than 1km from the coast. Spencer 1993: 351; 1995b: 31 fig.3.1 on location of Lesbian masonry and isodomic towers.

[16] Preziosi 1994: 62-3. Nearly all tower locations which possess evidence of outbuildings overlook an anchorage (*Fig.4.10*), but so do many other sites, so the distinction is more likely due to the state of archaeological preservation at individual sites.

[17] Ashton 1991: 38-39, 60-1; Preziosi 1994: 69.

[18] See *Table 3.5*. Ashton 1991: 122-123 (on the unsuitability of **43** as a lighthouse, Ross 1840: 139). *cf.* Empereur & Simossi 1989 figs. 1-5 for several (now submerged) towers in the ancient harbour of Thasos, which appear part of perimeter defences rather than lighthouses; circular tower E83 on beach at Hydra in Southern Argolid (Jameson, Runnels, van Andel 1994: 537); Hellenistic tower at sheltered harbour of Akbük on the coast of the ancient Rhodian *peraia* - Paton & Myres 1896: 197 (and Appendix 3.5 below). For harbour administration and the collection of dues by Amphissian Locrians, see Aeschines III.113. Pritchett 1980: 183-4 for toll collection at harbours (discussion of economic significance in Nixon & Price 1990: 149).

[19] Osborne 1986: 169.

TOWERS BETWEEN HEIGHTS	NO. TOWERS	% TOWERS	% TOTAL LAND SURFACE AREA	LAND SURFACE AREA KM^2	TOWERS/ KM^2
0-100m	10	18	22	16.5	*0.61*
100-200m	18	33	27	20.0	*0.90*
200-300m	16	29	30	22.0	*0.73*
300-400m	9	16	12	9.0	*1.00*
>400m	2	4	9	6.5	*0.31*

TABLE 5.1: *Distribution of Siphnos towers according height above sea level, compared to land area, expressed in towers/km^2 for bands of 100m above sea level.*

KMS FROM COAST	NO. OF TOWERS	% OF TOWERS	% TOTAL LAND AREA	LAND KM^2	TOWERS/ KM^2 LAND
0-0.5	20	36	42	31.0	*0.65*
0.5-1.0	16	29	18	13.5	*1.19*
1.0-1.5	11	20	14	10.5	*1.05*
1.5-2.0	4	7	10	7.5	*0.53*
2.0-2.5	2	4	5	4.0	*0.50*
2.5-3.0	2	4	10	7.5	*0.27*

TABLE 5.2: *Distribution of Siphnos towers according to distance from coast (at 500m bands), compared to land area.*

mountain slopes overlooking the sea. Thus the walking time to ascend or descend between towers **5** and **9** and bays to the south, despite their position only a few hundred metres as the crow flies, takes longer than the walk between Kamares and two of the towers (**16**, **20**) located furthest inland as the crow flies (>2km).

Analysis of coastal distance therefore indicates that few rural sites demonstrably fulfilled a 'public', strategic function associated with maritime activities such as watchposts.

INTERVISIBILITY OF RURAL SITES

The intervisibility matrix of all known tower sites (*Table 5.3*) indicates the relatively low level of inter-connection if the Siphnian towers were considered part of a pan-island, systematic signalling network.[20] Only a small number of towers (e.g. **18**, **23**, **26**, **50**) located on mountain ridges or spurs would have been even theoretically intervisible at long distances (without taking into account practical limitations on daytime visibility at mountain-top locations, such as the effect of heat haze or cloud cover).[21]

In addition, only a small minority of extant tower sites fall within direct line-of-sight of Kastro (**27**, **32**). Although more sites in the south-east fall within line-of-sight of Ayios Andreas (**27**, **29**, **32**, **38**, **39**, **40**, **41**, **45**, **47**, **48**) this is hardly surprising, given its dominant location on a ridge in the centre of the island, and does not prove its use as a Classical/Hellenistic communication post; indeed the location of several tower sites with similar viewsheds in the immediate vicinity of Ayios Andreas undermines such an interpretation of both rural sites and akropolis site.

As evidence against a communication function for Siphnian towers, it is noticeable that several sites were located on hill slopes some distance below the peak (**25**, **30**, **42**). If pan-island intervisibility had been the most important factor in their location, these towers may have been expected to occupy more suitable positions nearby.[22] Nor would a higher nominal height of the tower structure (over 10m for example) necessarily make a significant difference to overall site intervisibility: the physical geography of Siphnos means that viewsheds in the undulating mountain slope areas of the north, west and south-west would always be limited unless the sites were located on the actual peaks.

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[20] Hypothetical intervisibility was calculated in Ashton 1991 on the basis that tower heights were approximately twice the external diameter size (pers. comm., N. Ashton), ie. more than 10m in height for all towers except **42**. The data is therefore a 'mamimum' estimate of intervisibility: intervisibility potential would obviously be reduced if structures were more modest in height.

[21] Lock 1986: 103 for heat haze which may limit intervisibility to 1-2 km. Munn 1983: 89 n.168 for the effect of cloud cover over peak of Hymettos, and location of Hymettos tower below summit.

[22] *cf.* Preziosi 1994: 59 on **27** which would have had a substantially more comprehensive viewshed if it had been built a few hundred metres to the north, suggesting that local land use rather than intervisibility was the prime factor in its location.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
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TOTAL I	1	6	5	5	3	5	6	0	4	2	1	1	0	3	2	0	0	3	18	7	0	11	4	4	4	3	2	5	2	0	12	6	5	6	7	3	8	12	4	4	0	7	10	1	7	5	3	2	7	4	7	4	4	3	3	3
TOTAL (I)	0	0	0	0	0	1	2	1	0	1	1	6	1	0	2	5	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0

I = EXTANT TOWERS THEORETICALLY INTERVISIBLE

(I) = THEORETICALLY INTERVISIBLE RECORDED TOWERS (NOW LOST)

TABLE 5.3: *Theoretical intervisibility matrix between towers on Siphnos: data from GIS analysis in Ashton 1991 and corrections in Preziosi 1994. Intervisibility calculated according to tower heights 10m+.*

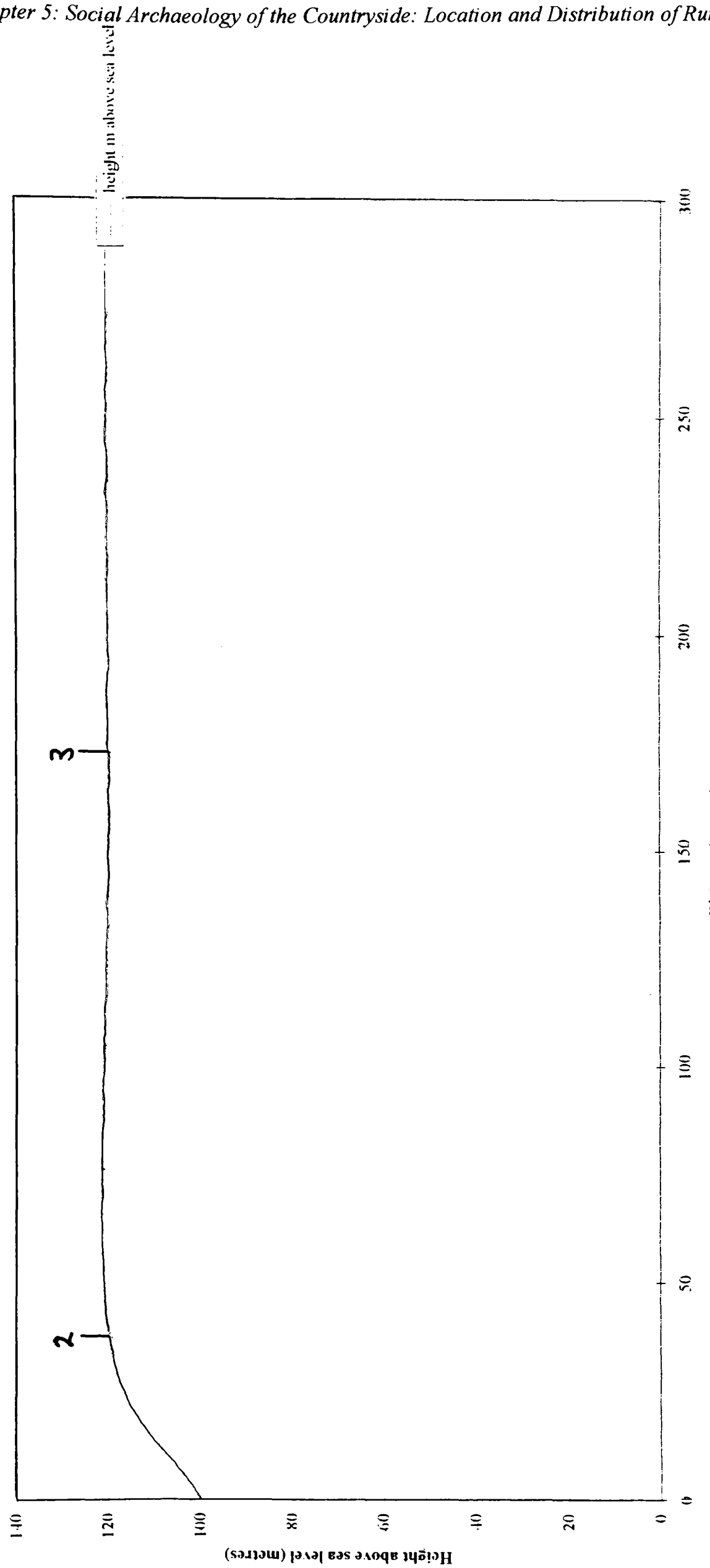

FIG. 5.1: *Cross section south-west to north -east between towers* **2** *and* **3**.
x-y scale = 1:1
tower heights estimated at ~6m.

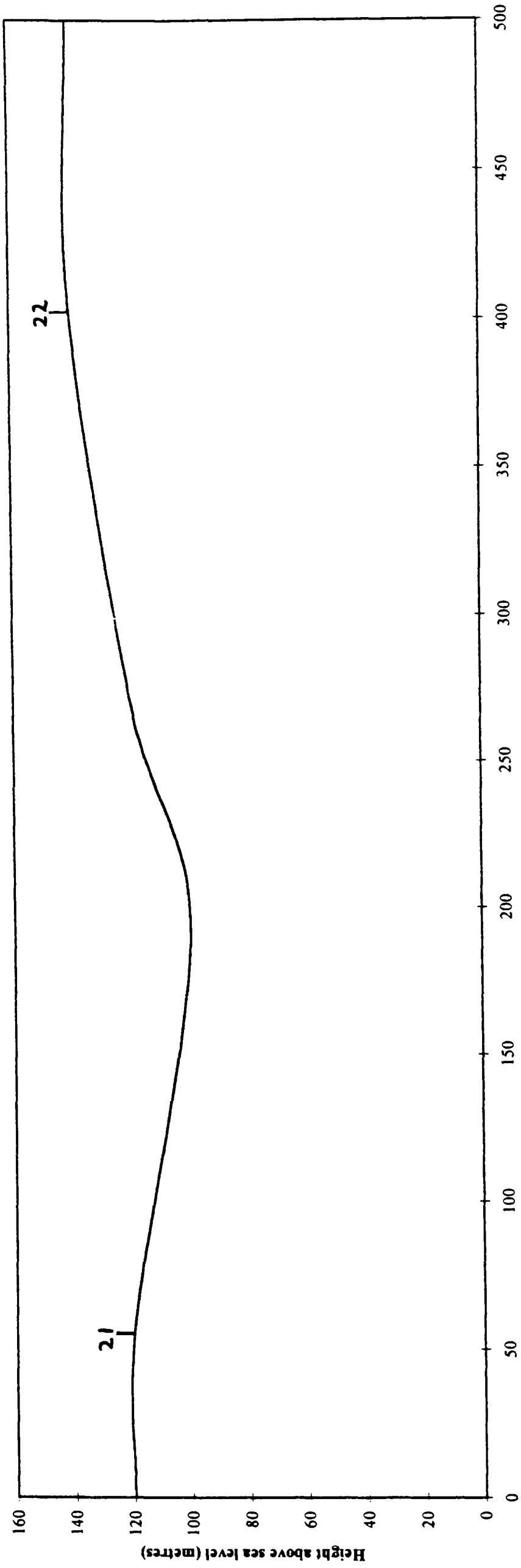

FIG. 5.2: *Cross section north-west to south-east between towers* **21** *and* **22**.
x-y scale = 1:1
tower heights estimates at ~6m.

Thus the tower at Marathiti (**29**), which is located on the lower slopes of a cultivable valley in the south-east of the island and exhibits finely worked schist masonry, may have been visible to travellers en route between Kastro and Faros bay, but was otherwise not intervisible to any extent. If the tower had been located a small distance higher up the southern slopes it would have become intervisible with other towers in the locality (**27**, **29**, **32**). Even if **29** was constructed before other towers, its location still indicates that a need for inter-communication was not a determining factor in its situation. Likewise other sites which occupied positions on the slopes of valleys (**13**, **16**, **20**, **28**, **46**, **53**) or valley bottoms (**15**, **49**) need have been no more than defensibly situated, rather than defensive structures.[23]

In this context, it is apposite to contrast tower sites with the location of later *vigla* (medieval watch-posts).[24] *Aspri Vigla*, situated on southern side of Kheronisos bay at 100 m above sea-level, has wider views of the entrance to Kheronisos, and approaches from north and west than any of the tower sites in the area (**1**, **2**, **3**, **4**, **5**, **6**). The *vigla* which lies approximately 1.5 km north-east of Vathi bay at 280m above sea-level is situated at the line-of-sight convergence between Vathi and Plati Yialos bays (*Pl.I.55*), in contrast to any of the nearby tower sites (**42**, **46**, **50**) with much more restricted viewsheds. In the centre of the island, the *vigla* situated on the peak of the eastern slopes of the Kamares valley (280 m above sea-level) has a wider viewshed both north-west and south-east than the ancient tower site (**20**) below the peak (*Pl.I.28, 20.1*). In fact, the location of **20** on a prominent spur 140 masl overlooking the primary communication axis across the island appears more concerned with its local dominance over passers-by than its long distance viewshed.

In conclusion, there are simply too many sites situated too close together in areas of flat terrain (*Figs.5.1-2*) — their placement often only a few hundred metres apart surely unnecessary — and too few 'nodes' situated in truly strategic locations to suggest the credible existence of a pan-island 'early warning network' even as a secondary use for the majority of Siphnian towers.[25] After all, 'static' intervisibility between two fixed-point sites is just one (rather inflexible) means of possible

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[23] For Argolid towers on ancient communication routes, see Lord 1939: 82; 1941: 109, Pikoulas 1996. However note *IG* II^2, 2776.16 (*cf.* Miller 1972: 81 n.21 'πυραμίδος'), and Pečírka 1973: 123 on their use as agricultural rather than strategic buildings. Kase, Szemler, Wilkie, Wallace 1991: 39, 42 argue for 'roadside' strategic towers in the Amphissian area of Phokis, but in the absence of any other locational information concerning the towers, and the *a priori* military intepretation given to others in the region, their functions remain unclear. On the potentially undermining effect which roads might exert on *polis* defence by facilitating enemy invasions, see Lewis 1996: 31, *contra* Hanson 1995: 304.

[24] See *Fig.3.1.*

[25] *cf.* the spacing between 'beacon' towers recorded in Ormerod 1924b: 44 n.1 ('every mile and a half' on Sicily, 'towers at intervals of two or three miles' on the north-east coast of Corsica).

inter-communication; a whole range of more flexible, viewing points and informal signalling devices (e.g. bonfires) would have provided a more efficient means of communication coverage.[26]

NEAREST NEIGHBOUR ANALYSIS

Nearly all recorded sites are located within 1 km crow-flies distance of another site (*Table 5.4)*. The location of 3 coastal towers (**1, 9, 12**) on promontories rather skews the overall average distance upwards from 0.6 to 0.7 km, which compares closely with Whitelaw's calculation of 600m nearest neighbour distance for selected Aegean tower sites.[27] However, Whitelaw's analysis for Siphnos was based upon selected towers in the west of the island (**25, 30, 31, 33, 34, 35, 36, 37**) and did not take into account the type of land, gradient, or level of accessibility between sites which may also affect 'real time' distances: in this case, the path distance average is 0.8 km, and the majority of sites fall within 1 km walking distance of another recorded site.[28]

In fact, relatively close clustering of 3 or more tower sites occurs in several areas of the island, not merely the sites sampled by Whitelaw, and is especially distinctive in areas furthest from the *asty*.[29] In the north of the island at Kheronisos, 5 towers are situated within a few minutes walk of each other, at distances of no more than 200-300m (**2, 3, 4, 5, 6**). Although the terrain is more difficult along the west coast (thus affecting 'real time' distance), 5 tower sites are located within 1.5 km (**19, 21, 22, 23, 24**) around Vlasi.[30] Nor can these clusters be explained by recourse to environmental factors (such as water supply) as has been claimed elsewhere: the number of local water sources (as well as apparent on-site man made structures) indicate that, although some sites are located near major springs (e.g. **13, 18, 19, 21, 22, 23, 24, 32**) clusters were not nucleated around springs.[31]

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[26] Llobera 1996: 613 for the problem of static intervisibility assumed between two fixed points and the element of perspective from a *mobile* individual's body.

[27] Whitelaw 1994: 175 for comparative analysis of nearest neighbour distances between rural sites. Steinhauer 1994: 176-183 notes distances of 120-250m between complexes of rural buildings in the Spata region of Attika, an area he associates with *eschatia*. Steinhauer 1994: 177-180 argues that the small size, simple construction and absence of towers from such rural sites makes it more likely that they were overseers' quarters belonging to urban owners, rather than isolated farmsteads.

[28] There is considerable variability between the 'crow-flies' and 'real time' distances of these towers, especially **30**, which is much more isolated from other towers in the area than its map location suggests, due its location below the peak on an undulating finger ridge.

[29] N.B. no two recorded sites on Siphnos are as close as 'twin' towers identified in other regions of the Aegean (e.g. Ober 1985: 163-4 on the Karoumbalo twin towers in northern Attika, located 33m apart; Jameson, Runnels, van Andel 1994: 450-451 on possible twin towers at Korakia in southern Argolid).

[30] Thus the 'five harassing hours' spent by Young walking less than 3 km around the south of Kamares bay to **19** (Young 1956b: 56). An inland route over the mountain saddle of Profitis Elias (by **18**) provides easier access.

[31] *contra* Balcer 1985: 37, 'This settlement pattern of farms clustered about manorial estates with *pyrgoi* arose in the rural (or *chora*) districts of the city-state due to the general lack of water and dependences of the village upon central springs. Isolated manors rarely if ever occurred while clusters of homesteads and manors as rural villages (komai) commonly appeared.'

Tower No.	nearest tower	tower visible	crow flies distance km	path distance km	split radius km
2	3	y	0.2	0.2	0.08
3	2	y	0.2	0.2	0.08
23	24	y	0.2	0.2	0.1
24	23	y	0.2	0.2	0.1
34	36	y	0.2	0.2	0.1
36	34	y	0.2	0.2	0.1
5	6	y	0.2	0.2	0.12
6	5	y	0.2	0.2	0.12
31	33	y	0.2	0.3	0.12
33	31	y	0.2	0.3	0.12
21	22	y	0.4	0.4	0.18
22	21	y	0.4	0.4	0.18
19	21	y	0.4	0.5	0.22
39	41	n	0.4	0.5	0.22
40	41?	y?	0.5	0.5	0.24
41	40?	y?	0.5	0.5	0.24
7	10?	y?	0.5	0.6	0.26
35	33	y	0.4	0.6	0.18
42	44	y	0.6	0.6	0.32
44	42	y	0.6	0.6	0.32
4	3	y	0.5	0.7	0.27
37	35	n	0.6	0.7	0.28
50	51	y	0.7	0.7	0.36
52	53	y	0.7	0.7	0.34
53	52	y	0.7	0.7	0.34
8	10	y	0.7	0.8	0.34
10	8	y	0.7	0.8	0.34
26	31	y	0.6	0.8	0.3
27	32	y	0.7	0.8	0.34
32	27	y	0.7	0.8	0.34
43	47	y	0.4	0.8	0.18
47	43	y	0.4	0.8	0.18
51	52	y	0.8	0.9	0.42
17	18	y	0.8	1.0	0.42
18	17	y	0.8	1.0	0.42
30	31	y	0.4	1.0	0.22
54	55	y	0.9	1.0	0.46
55	54	y	0.9	1.0	0.46
16	20?	y?	0.7	1.0	0.36
20	16?	y?	0.7	1.0	0.36
46	41	n	0.9	1.0	0.44
11	13	y	0.8	1.1	0.4
13	11	y	0.8	1.1	0.4
29	32	n	1.0	1.1	0.5
48	45	y	1.1	1.1	0.54
14	13	n	1.0	1.2	0.52
49	50	y	1.1	1.2	0.54
25	30	n	0.6	1.3	0.32
15	16?	y?	1.2	1.3	0.6
45	47	n	0.8	1.3	0.4
38	43	n	1.2	1.4	0.6
28	27	y	1.4	1.5	0.72
1	2	y	1.4	1.5	0.72
9	4	n	1.8	2.6	0.88
12	15?	y?	3.2	3.4	1.62
		average	**0.7**	**0.8**	

TABLE 5.4: *Nearest Neighbour Analysis, sorted according to path distance with nominal split radius between sites. Most sites located within 1 km walking distance (average 0.8 km). Nominal split radius suggests maximum hypothetical 'site catchment' of less than 20 hectares for these sites.*

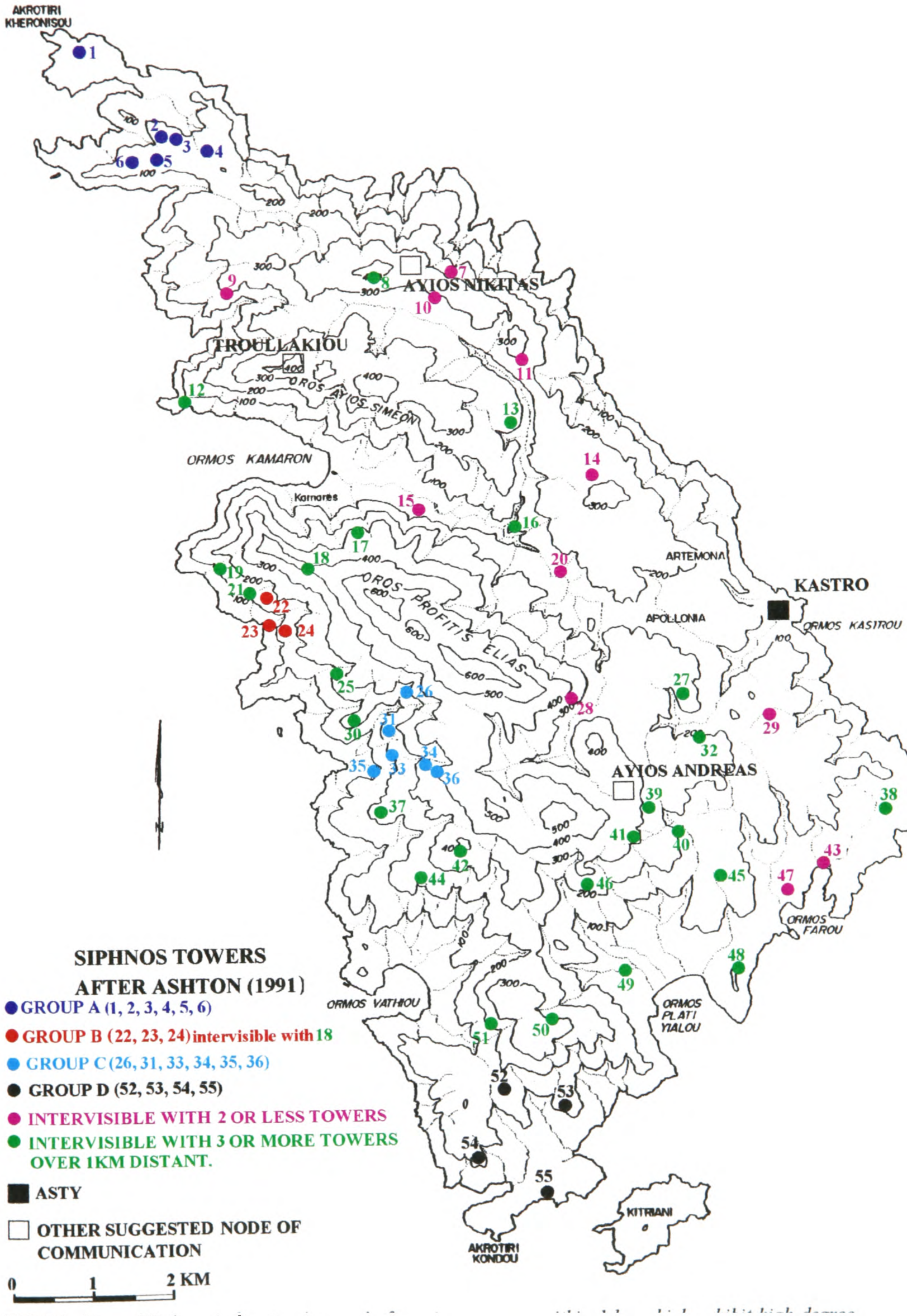

FIG.5.3: *Map of Siphnos indicating 'groups' of proximate towers within 1 km which exhibit high degree of mutual intervisibility within local 'group' and low degree of intervisibility with towers outside 'group'. Such groups are typically situated in the extremities from the asty. Also compare similarity of diameter sizes in the case of groups C & D (Fig.4.2).*

Instead, combining the available archaeological and locational information of diameter plan size, tower intervisibility and nearest neighbour data, it is possible to identify groups of mutually intervisible towers located less than 1 km apart possessing similar plan dimensions (*Fig. 5.3*).

It is perhaps not surprising that the mutual 'group' intervisibility of proximate towers is high (*Table 5.3*). What is more striking is the lack of intervisibility with other towers beyond the 'group'.[32] There may, of course, be destroyed or unrecorded towers which 'plugged' gaps, but the decision to build in areas which tended to be isolated in their intra-island viewshed suggests that 'nearest neighbour', local intervisibility was a more important locational factor than a systematic chain of highly visible nodal points.

CONCLUSION: SOCIAL TOPOGRAPHY OF THE COUNTRYSIDE

This chapter has attempted to analyse the context of sites according to geographical characteristics relevant to the interpretation of their social roles. The series of locational analyses indicates the unlikelihood that the majority of Siphnian towers operated as strategic structures within the 'public' domain. Due to the political organisation of the island (a single polity), territorial demarcation at *polis* level (in a manner suggested for rural structures on Lesbos or Keos) never provided a necessary reason for such monumental construction.[33]

Nor would it appear that other 'defensive' functions, such as fortified watch-posts operating as 'nodes' in a communication network, satisfactorily explain the location and distribution of clustered Siphnian sites.[34] The tendency of intervisibility studies to impose a rigidly determinist interpretation of ancient landscapes, whereby sites in line-of-sight must implicitly correlate to an 'early-warning system' (a term which, in itself, carries highly charged connotations of modern military strategy), must be revised to provide a more sensitive reading of the variety of activities within human landscapes.[35]

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[32] On the west coast, the sites at **18**, **19** and **21** in theory afforded longer-distance viewsheds beyond nearest neighbour sites. However, on practical limits of intervisibility, see above p.170.

[33] Boussac & Rougemont 1983: 117 note several towers which may have been situated near polity borders on Amorgos. Mendoni 1994: 148 n.7 records 'a series of towers - watch towers' located along the hypothetical border between the *chora* of Poieessa and that of Karthaia; Spencer 1995b: 38 for monumental rural construction close to the suggested boundaries of Lesbian polities.

[34] As Munn 1983: 23 notes with regard to the Megarid, where considerable 'clustering' of tower structures also occurs, 'It is hard to understand why a multiplicity of isolated towers within a small area would have been built to control a strategic section of road when that purpose could have been effected by building one sizeable fort, where a sufficient number of troops could have been concentrated to defend themselves and the surrounding countryside most effectively, if territorial control was indeed the purpose of these towers...It is certainly possible that alarm beacons were from time to time raised from private towers in the countryside whenever a threat suddenly appeared...But these were chance events, and there is no reason to believe that private towers were ever organized into regular lookout and signal networks.' Also Munn 1993: 16 on the difficulties of executing an 'early warning', 'fortress' system.

[35] Llobera 1996.

Rural site intervisibility was predominantly local, rather than pan-island in its scope. Although some towers do seem to have been situated on natural communication routes (possibly ancient paths), a specifically *strategic* function ought not necessarily to be assigned to them: their topographical influence may have operated at a more subtle, symbolic level within the *locale* of other neighbouring sites, which in some cases appear to have possessed similar plan dimensions suggestive of emulation.[36]

This symbolic aspect of monumental rural construction, viewed from the perspective of a mobile individual, not merely as static objects with a fixed viewshed, has often been under-appreciated.[37] Sites conspicuously located on an important axis of communication (**8**, **10**, **11**, **15**, **20**, **39**, **45**, **46**) or on points of natural prominence (**4**, **18**, **23**, **26**, **32**, **48**, **54**, **55**) may reflect a concern with visible construction within the *private* domain, where prominence in the landscape was as important as the potential viewshed which the structure afforded.

To support this conclusion, epigraphic evidence which indicates that rural towers occupied a significant position within the social topography of a *polis* may be adduced from a Teian inscription of uncertain, though probably Hellenistic, date (*CIG* 3064).[38]

[----]τιος, τοῦ Σειδηρέω[ς πύργου---
---]οδωρος, τοῦ Κίδυος πύργου [---
----] τοῦ ῾Ηρωνος πύργου, Πελ[---]
Βα[θυκλ]έων τοῦ Πρύου πύργου, Πρυ[ίδης
῾Ορθ]αγ[ό]ρης, τοῦ Ποίκεω πύργου, Βα [---
Ε]ὐθυῤῥήμ<ω>ν, το[ῦ Β]οίου πύργου, Βοίδι[ης
Πολυο<λ>βου τοῦ Κιναβάλου πύργου, Βριθαί[δης
Ἐ<ρ>μόδι[κος τοῦ] Αλ<ξ>ήνωρος πύργου, Αλξηνορίδε[ς]
῾Αρτέμ<ω>ν, τοῦ Φιλαίου πύργου, Φιλαίδης
[---]οκ<λῆ>ς τοῦ Γαλαίσου πύργου, Γαλαισίδης
ἄναρχον *vacat*
Σεύχης τοῦ Μυστ<ο>υ πύργου Εὐρυμηστορίδης
ἀναρχ{αι}α <δ>υ[ο] *vacat*
[Θ]αρσύν[ω]ν ἐκ τοῦ Ἱέρυος πύργου Ζωριάδης
Απολλ<ώ>ν<ι>ος ἐκ τοῦ Δάδδου πύργου Δαδ<δ>ειος
῾Ερμ<όθ>εστος, ἐκ τοῦ Ἰσθμίου πύργου, Λεωνίδης
[---]ωιστο<ς> καλοπύργος-----]
ἄναρχα <τ>εσ<σ>ε<ρ>α *vacat*
῾Αμ<φ>ιμέ[δ]ων, τοῦ Βήβωνος πύργου, Λυκκίδης
[---] τοῦ [---] πύργου, Πολλίδης
[---τοῦ Κα]λ[λ]ι<π>{ι}<η>ς πύργου Καλλιπάδης
Ζη<ν>[ων, -----]

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[36] N.B. Lucas 1712: 289 who attributed the construction of tower houses in Andros town during Ottoman rule to competitive emulation. *cf.* monumental architecture, settlement and society in the Mani, where tower construction (Fermor 1957: 391; Wagstaff 1965: 73) was a literal act of raising status to the aristocracy, rather than a passive reflection of social standing (*cf.* Appadurai 1986b: 34).

[37] *cf.* Spencer 1995b: 33-41 on rural structures and group definition in the landscape of Lesbos.

[38] The inscription itself is no longer extant: the text is a composite of two copies, with beginning and end missing.

ἀναρχα δύο *vacat*
Πάντανδρος, τοῦ Σίντυος πύργου, Βρυσκίδης
ἀναρχ[ο]ν *vacat*
Πάρμις τοῦ Σθενέλου πύργου Χαλκιδειος
[---] τοῦ Κόθου πύργου Κοθίδης
[---] τοῦ Ἑκαδίου πύργου Σκηβηίδης
Ἀπολλοδότος, τοῦ Μεγαμήδευς πύργου Μαιανρίδ[ης]
Οὐλιά<δ>ης τοῦ πύργου τοῦ Κιζωνος, Κίζων
Ναίων, τοῦ Μηράδου πύργου Βρυσκίδης
Κωλωτίων τοῦ Αλκίμου πύργου, Αλκιμίδης
Ἀρίστιππος, τοῦ Μαλίου πύργου, Μαλιάδης
Μητρώδορος τοῦ Κοπρέως πύργου, Βρεαλλωνίδης
[---] έας του Τρωγίλου πύργου, Τρωγιλίδ<η>ς
CIG 3064. 1-35

[....]tios, of the [tower] of Sidereus; [...]odoros [...], of the tower of Kidys; [...] the Pel[?], of the tower of Heron; Bathykleon the Pryid, of the tower of Pryes; Orthagores the Ba[...], of the tower of Poikes; Euthyrremon the Boid, of the tower of Boios; Polyolbos[39] the Brithaid, of the tower of Kinabalos; Hermodikos[40] the Alxenorid, of the tower of Alxenor; Artemon the Philaid, of the tower of Philaios; [...]okles the Galaisid, of the tower of Galaisos; vacant site; Seukhes the Eurymestorid, of the tower of Mystos; two vacant sites; Tharsynon the Zoriad, from the tower of Hiereus; Apollonios the Daddid, from the tower of Daddos; Hermothestos the Leonid, from the tower of Isthmios; [...]oistos good-tower [...]; four vacant sites; Amphimedon the Lykkid, of the tower of Bebon; [...] the Pollid, of the tower of [...]; [...] the Kallip[pi]did, of the tower of Kallipes; Zenon[41] [...]; two vacant sites; Pantandros the Bryskid, of the tower of Sintyos; vacant site; Parmis the Khalkid, of the tower of Sthenelos; [...] the Kothid, of the tower of Kothos; [...] the Skebeid, of the tower of Hekadios; Apollodotos the Maianrid, of the tower; Ouliades, a Kizon, the tower of Kizon; Naion the Bryskid, of the tower of Merados; Kolotion the Alkimid, of the tower of Alkimos; Aristippos the Maliad, of the tower of Malios; Metrodoros the Breallonid, of the tower of Kopreus; [...]eas the Trogilid, of the tower of Trogilos.

The inscription was first interpreted as an '*archon* list' (despite the disturbing number of positions left ἀναρχα), thus requiring a convoluted explanation of the *pyrgoi* in terms of *deme*- or *symmory*-like groupings, complementary to individuals' names and their *genos*.[42] An alternative interpretation of the '*archon* list' made *pyrgoi* the equivalent of town 'quarters', where localities were named after fortification towers in the circuit wall of the *asty*, and the collective names represented military, tribal divisions.[43] Hunt, however, recognised that things other than public

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[39] After *LGPN 1*: 380 attested on fourth-century BC Chios.

[40] Restored after *LGPN 1*: 165 fourth/third-century BC attestations on Delos, Lesbos, Samos.

[41] Restored after *LGPN 1*: 195; *IG* XII 5, 881.22.

[42] Commentary by Boeckh on *CIG* 3064; *RE* V A, 1: 553-6; Guiraud 1893: 69-70; Rogers 1905; Meyer 1937: 282, 286. This interpretation is still present in revised ninth ed. (1996) of *Liddell & Scott* πύργος II.2. Neither Bourriot 1976 or Roussel 1976 discuss the document, πύργοι or the associational names in relation to corporate groups in the *polis* (*cf.* Guiraud 1893: 69-70).

[43] Béquignon 1928: 192-202 following Aineias Tacitus III.1, (*cf.* philological attempts to derive *burgus* from πύργος in Schuchhardt 1929: 23), although it is to be noted that Aineias is describing an *ad hoc* response in an emergency - he goes on to suggest more organised methods which may be implemented in peacetime (III.4-6). For the difficulties of Béquignon's interpretation, see Hunt 1947: 70.

office (for example land) might be classed ἀναρχα, and proposed a more credible alternative, namely that πύργοι were rural towers and the list recorded the ownership of private, eponymous structures by individual with the name of an association, or possibly a demotic in certain cases.[44] Ten of the forty sites were therefore ἀναρχα; of the others at least ten erstwhile owners appeared to have familial links with an eponymous tower, which simultaneously contrasted the alienability of some tower properties with the inheritance system of others.[45]

Recent scholarship has disagreed about Hunt's interpretation of the document: Munn followed the interpretation of *pyrgoi* as towers on private estates, although with reasonable reservations about Hunt's theory of 'feudal' social relations.[46] Jones reverted to a modified position of the earlier interpretation, and argued that patronymics in *CIG* II 3064 are *symmoriai*, and that, '*Pyrgos* and *symmoria* may well, therefore, have complemented one another as overlapping territorial and personal divisions below the phylai.'[47] However, this theory fails to address the problems of vacant positions which Hunt raised. In addition, philological re-evaluation of πύργος has suggested that its use as a military term belongs in a personal (metaphorical) sense to individuals, rather than as a formal term applying to a group.[48]

The most plausible interpretation of the document's content is that the *pyrgoi* do indeed refer to private rural structures which appear to have exercised a significant toponymic role. The number and location of Siphnian structures, when considered together with architectural features discussed previously, strongly indicates that their function fell within the private sphere of the household. In the following chapters, attention is focused upon their relationship to local resources and land use in the *chora*.

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[44] Hunt 1947: 71 n.21 acknowledged the unusual omission of father's name and chose to interpret the association names as γένη following the earlier interpretation of *archons* according to γένος, though the possibility that they may represent other associational groupings is never addressed. Possible demotics include Χαλκιδειος (line 26) and Κίζων (line 30), although neither is certain.

[45] The prepositional phrase ἐκ inserted before the genitive in lines 14-16 has never been adequately explained; Hunt 1947 passed over the phrase. *CIG* commentary p.651 took it as an optional gloss meaning 'from (the *deme* of)' (*cf. IG* XII 5, 872.2 'ἐκ πό[λεως]'). It may be that the document dealt with the registration of all known tower sites (including those ἀναρχα) where notable individuals had forcibly lost possession. Apparent inheritance in lines 4, 6, 8, 9, 10, 15, 21(?), 27, 30(?), 32, 33, 35. As part of land property, private towers and their contents would most likely exist as φανερὰ οὐσία (Guiraud 1893: 173; Finley 1952: 54-5; Gernet 1968: 408; Schaps 1979: 4-13; Gabrielsen 1986.

[46] Munn 1983: 72 n. 68. Balcer 1985: 35-36 follows Hunt in interpreting Teian *pyrgoi* as aristocratic or oligarchic 'strong rural agricultural estates'.

[47] Jones 1987: 303 on *SIG*^{3} 961, 307-310 on *CIG* II 3064.

[48] van Wees 1986: 299 n.66 discusses the interpretation of *Iliad* IV.333-5 (*cf. Iliad* IV.334; VII.219; XI.556; XII.43; XIII.152; XV.618; XVII.128) and favours the translation 'bulkwark', rather than the meaning of 'contingent', which other commentators have adopted, noting the metaphorical usage in Kallinos I.20. Also van Wees 1997: 673 n.7, 'The word *purgos*, 'tower,' is taken by many...in two passages to a contingent. It is in fact likely to refer to its leader, and in any case to be used metaphorically ('a tower of strength'), as it is in the *Odyssey* (XI.556).'

CHAPTER 6

SOCIAL ARCHAEOLOGY OF THE COUNTRYSIDE: LAND USE AT RURAL SITES

> 'It is now clear that wherever we have evidence [of ancient towers] it points to farming or other connected industries as the object of these towers' existence; we may safely conclude that all were in fact parts of country estates...Although we have deprived our towers of the romance connected with pirates and flashing fire-signals, we have established (as I hope the reader will agree) their real function, which is always an advance. Furthermore, the economic historian is given a new means of determining what areas were under ancient cultivation, and how they compare with modern exploitation of Greek agricultural resources.'
> Young 1956a: 141, 143

This chapter examines the location of rural sites with regard to primary production in the *chora*. Although variable to a certain degree, according to types of land holding (whether consolidated or fragmented), types of habitation (seasonal or permanent) or types of land use, it is axiomatic that, 'in whatever way farm and farmstead are defined, the attachment of land to the structures that stand on these sites should be beyond dispute'.[1] However, although Young referred generally to 'farming', and appeared to imply olive and vine cultivation on the basis of stone press installations at **22** and **48**, no more precise attempt was made to relate location and site use.[2] Indeed, further research into the economic geography of the ancient countryside has indicated a wider range of rural productive activity than inferred in the terminology of 'country estates', 'farms' and 'farmsteads'.[3] Thus investigation of fishing, extractive activities and animal husbandry — different, but not socially unacceptable ways of 'farming' the territory of the *polis* — needs to be integrated into the wider archaeology of productive activities.[4]

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[1] Jameson 1994a: 55. Isager & Skydsgaard 1992: 68 argue that agricultural buildings cannot be identified solely by their architecture or by the presence of storage vessels, since crops may not be stored in the place where they were produced. However, this statement needs to be qualified by *locational* information: in an urban location, vessels and structures may indeed represent centres of consumption rather than production, but in a rural location such structures (as Jameson notes) must be considered in relation to local *productive* activity in the *chora* (*cf.* Spencer 1993: 90-91 on the problems of assessing ancient land use around ancient rural sites).

[2] Young 1956a: 140.

[3] See above Ch.1.

[4] From Aeschylus *Persians* 238 to the pseudo-Aristotelian claim of similarities between mining and agriculture ([Aristotle] *Politics* 1258b 27-31), mineral extraction might be couched in agricultural terms. Coming from such a conservative source, this latter reference is perhaps the clearest indication of the social acceptability of the 'agriculture' of mining among those quick to condemn bausanic activity (*cf.* Osborne 1987: 76-79).

FISHING

To begin with an activity most closely connected with coastal areas of the island, the harbours of Faros, Kamares and Vathi all appear to have maintained small populations directly engaged in maritime activities (e.g. fishing) during historically documented periods. This is an occupation which, often through relative historical and archaeological invisibility (further vitiated by the prejudices of the ancient authors who do mention them), tends to become minimised in some reconstructions of the ancient economy.[5]

Debates concerning the relative importance of fishing industries in the ancient world have, until recently, revolved around the assumption that fish was a staple (and even a meat substitute).[6] However, quantitative assessment of fish stock and ethnographic comparison indicate that fishing activities in the Aegean are better interpreted as the acquisition of commodities for market exchange (in order to acquire deficient staples) rather than a mainstay, or even an alternative source of subsistence.[7] The size of such a commodity industry is unclear, but it is plausible that the common *modus operandi* would have been a small-scale fishing community exploiting local resources.[8]

However, there is no direct evidence to link any Siphnian rural sites to this activity in the manner of 'tunny towers' used to lookout for shoals of fish,[9] and such involvement can only be speculated in the case of towers **1**, **23**, **43** where other maritime functions are also possible.

MINING

Given that mineral deposits have, historically, been Siphnos' most notable rural resource, it is logical to analyse their location with regard to rural sites, especially since the proximity of mineral resources to monumental rural sites in a number of Aegean locations (e.g. Attika, Keos, Naxos, Seriphos and Thasos) has prompted their association with the supervision and administration of

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5 Finley 1985a: 136 comments on the 'unusual opportunity' for the demos' participation in ferrying at Tenedos, and fishing at Tarentum and Byzantium (Aristotle *Pol.* 1291*b*), following (almost word-for-word) the argument of Hasebroek 1933: 37 (itself derivative from Francotte 1900: 53-55) that the reason such places were mentioned was 'primarily because they were exceptions to the general rule'. However neither Hasebroek, Finley nor Aristotle elaborate as to why these *poleis* should have been blessed with such an unusual opportunity for commercial maritime transport (of humans and goods), in implicit contrast to other *poleis* with maritime access.

6 Bolkestein 1958: 36-41.

7 Gallant 1985 criticises the Bolkestein position, but tends to see fishing opportunities as a form of alternative subsistence strategy, ultimately dependent upon agrarian considerations. Purcell 1995a; Davidson 1997: 12 for fish as commodity (on the question of quantity and quality, *cf.* Powell 1996: 35, 'what the Mediterranean lacks in quantity, it makes up for in variety.')

8 Mossé 1995: 47. *cf.* Purcell 1990: 51-52 on the Anthedonians of Boiotia (*Geographi Graeci Minores* i.104).

9 Bintliff 1977: 240-241 (Aelian *De Natura* 15.5).

ancient extractive activities (*Fig.6.9c*).[10] However, as a preliminary to such a locational study, questions of chronology related to mining activity in the later Classical and Hellenistic period must be addressed.

CHRONOLOGY OF EXTRACTIVE ACTIVITIES

The acme of Siphnian mining wealth in antiquity is often attributed to the late Archaic period, based on Herodotos' account of the *sule* enforced by Samian exiles (III.57-58), which alludes to the construction of the Siphnian treasury at Delphi and the islanders' contemporary wealth, while (a chronologically unspecified) decline in mineral wealth is seen rationalised in Pausanias' account (X.11.2) of their Delphic treasury in the second century AD, which attributes the decline to an inundation of the sea.[11]

However, it would be a mistake (based on modernising assumptions of industrial output) to assume that, even in a 'boom' period, production was consistent on even a short-term basis. The variability of mining production, rationalised in Herodotos' story by an oracular response 'foretelling' the Samian attack (III.57), is not merely a literary commonplace of *tyche* ('fortune') also applicable to the Laurion mines windfall early in the fifth century BC (Her. VII.144). Ethnographic studies serve to show that mining activities in both pre-mechanised and fully industrialised societies (using prospection equipment) are notoriously subject to swings in production output (and accompanying labour demands), according to the richness of seams worked.[12]

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[10] For towers in the mining areas of Southern Attika, see Young 1956a: 126 (Hilltop tower); Spitaels 1978 (Thorikos tower AX); Vanhove 1994: 42-3 (Black Dog Tower, Yellow Tower and Doric Tower); Photos-Jones & Jones 1994: 314 fig.1 (Golden Pig Tower located by three industrial, ore washing complexes). For island towers associated with extractive activities see Nowicka 1975: 53 (Kheimarrou tower, Naxos); Ross 1840: 136, Bent 1965: 19-20 (Aspropyrgos tower, Seriphos); Osborne 1986, Kozelj & Wurch-Kozelj 1989: 180-181 (Thasos towers 20, 21, 27, 30). Cherry, Davis, Mantzourani 1991b: 292 argue against extractive activity as a primary cause for tower construction on Keos *contra* Dousougli & Morris 1994: 218. See now Mendoni & Kolaïti 1993: 104-106 for surveys of Keian quarries in the north-east of the island. In addition, several large stone buildings comprising a rectangular plan, monumental masonry, jamb lintel entrances and corbelled stone roofs — known locally as 'Dragon Houses' due to the impressive scale of construction — are found on the slopes of quarry areas in Attika and Euboia. They are generally dated to the Roman period, and have been variously interpreted as store-rooms or habitation complexes for quarry slaves (Carpenter & Boyd 1977) or as garrison quarters for military supervisors (Kozelj & Wurch Kozelj 1995) due to their dimensions which closely fit Roman measurement units. Thiriet 1958: 210-202 no.850, Lock 1986: 107 n.27 on a tower which protected Venetian salt-workings at Saiata on Corfu. For towers and mines generally see Osborne 1987: 78-79; Dousougli & Morris 1994: 218.

[11] 'ἐπικλύσασα ἡ θάλασσα ἀφανῆ τὰ μέταλλά σφισιν ἐποίησεν' ('The sea flooded in and made their mines disappear'). Healy 1978: 53, Osborne 1987: 76 place the drop in output in or just after the Archaic period. Runnels 1987: 340 suggests decline due to lack of fuel or competition with Laurion, although no date is specified. Ashton 1991: 14-16 for discussion of literary and archaeological evidence. The mines of Vlasi, Xeroxilon, Rafelia, Kapsallos, Tsingouras, Vorini and Ayios Silvestros lie several hundred metres above sea level, while those at Ayios Ioannis lie 60 m above sea-level, more than 20m at Apokofto (Pernicka & Wagner 1985a). Only the lower galleries at Ayios Sostis lie close enough to current sea-level to make them susceptible to flooding, and even then there are numerous gallery entrances further up the slope.

[12] See Bakewell 1984, Tandeter 1993 for conditions affecting mining production in South America during the sixteenth to eighteenth centuries AD. Likewise Emberson-Bain 1994 for fluctuations in nineteenth-century gold

Pertinent to this comparative information, a number of scholars have challenged the traditional Archaic 'boom' and Classical 'decline', arguing that ore mining production, and perhaps processing, continued well into the fifth, and even fourth century BC.[13] The evidence from literary, epigraphic and numismatic sources is too problematic to date with any accuracy, and varies from appeals to the contribution of one pentakonter at Salamis,[14] and the tribute payments of the Athenian Empire,[15] as comparative indices of the islanders' wealth in the Classical period. However, radio-carbon dates from material within mine shafts would appear to support the interpretation that mines were exploited, perhaps intermittently, in the Classical period and later.[16]

The chronology of ancient lead-silver and possible gold exploitation on the island is further complicated by the extensive archaeological remains of post-antique workings (a problem common in the identification and dating of ancient mine and quarry sites).[17] There is no clear documentary or archaeological evidence of mining in Byzantine times,[18] and only an oblique passage in the writings of the traveller Tournefort concerning the visit, on behalf of the Ottoman emperor, of a group of Jewish mine prospectors sometime around 1650 AD attests activity there before Greek Independence.[19] However, in the second half of the nineteenth-century, the French Mining Company at Laurion began mining operations on the island, working sites at Ayios Sostis, Ayios Silvestros, Vorini, Rafelia, Kapsallos, Tsingouras, Xeroxilo in the north and Ayios Ioannis in the south.[20] Iron and zinc ores were mined as well as lead-silver ores, and a mechanised transport system of cable railways was constructed to carry material from the east (Vorini) and from the slopes of Mt. Profitis Elias for loading at Kamares bay, and in the south a smaller system was built between Faros bay and Ayios Ioannis. In consequence, the mine sites themselves are an amalgam of ancient and modern workings, and it must be assumed that the modern transport system also dealt with substantial amounts of ancient material which was taken for processing at Laurion.[21]

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mining on the island of Fiji. Callender & Macaulay 1984 for silver mining on the Scottish island of Islay. Berg 1993 illustrates the substantial seasonal labour demands required for Norwegian mines in the eighteenth century. Slater 1994 on the forced short term movements of contemporary Amazon gold miners (often working in servile conditions).

[13] Ashton 1991: 20 argues for continued prosperity until at least the last quarter of the fifth century BC (*cf.* Meiggs 1972: 558-589); Francis & Vickers 1983: 56-58, Gill 1990: 290 see a continuation into the fourth century BC, pointing out that considerable 're-processing' of slag material or discarded ore is often part of the life-cycle of mineral exploitation.

[14] Herodotos VIII.46.

[15] Siphnos contributed 3 talents in earlier fifth-century assessments, 9 talents in the re-assessment (Meiggs 1972: 558-589; Lewis 1994: 285, 296).

[16] Pernicka & Wagner 1985b.

[17] Dworakowska 1975: 14-15 as applied to quarries.

[18] Generally, see Cheetham 1981: 253.

[19] Tournefort 1741: 187 on prospection for lead mining. Simopoulos 1973: 263 for exploitation of lead (without mining) in the mid-eighteenth century.

[20] Weisgerber 1985b.

[21] Weisgerber 1985b.

MINES AND RURAL SITES

In addition to difficulties of chronology, attempts at quantification of ancient extractive activity on the island are problematic. Historical sources are limited: the only figures we have are the 10 and 100 talents respectively demanded and exacted by the Samian exiles from the Siphnians during the tyranny of Polykrates, sometime before 522 BC.[22] However, scholars have pointed out the dangers of assuming that such figures form the basis of any 'statistical' quantification.[23]

If ancient Siphnian metallurgical production is impossible to quantify from historical sources, then archaeological evidence at least supplies some, albeit impressionistic, order of magnitude, even if it is not possible to determine the social organisation of such activities.[24] However, the relative archaeological invisibility of either metallurgical processing remains or Siphnian coinage is notable.[25] Slag material is recorded to the west of Plati Yialos bay, in Kamares and at mine sites on the east coast (*Fig.6.1*), but the slags in the south-west of the island appear the result of copper rather than lead processing,[26] leading some archaeologists to characterise ancient mining activities there as 'mere grubbing' in comparison with Athenian silver mining in the Laurion region of southern Attika.[27] It is generally considered that Archaic metalworking was not particularly developed on Siphnos, and with the relative paucity of Siphnian coinage, in combination with the evidence of provenance studies of Archaic coinages, it has been suggested that Siphnian ore may have been processed elsewhere.[28]

However, even small-scale mineral exploitation would have had a very significant effect upon the whole population of the *polis*, due to the intensity of operations required to exploit the mineral resources scattered in several locations across the countryside, and the accompanying problems of labour force supply and supervision, transport of raw materials, processing equipment, and

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[22] Herodotos III.57-58.

[23] Michell 1958: 91, 'It is unwise to give too much credence to statements of amounts or numbers in ancient times, and these with regard to the gold from both islands [Thasos and Siphnos] are undoubtedly exaggerations, except in so far as they refer to production over a few years.' For the archaeology of mining on Thasos, see Courtils, Kozelj, Muller 1982; Wagner & Weisgerber 1988.

[24] The annual sharing of the revenue, according to Herodotos III.57 indicates state organisation, but we do not know whether Herodotos merely retrojected what he understood to be the pre-Themistoklean manner of Athenian mine organisation into his story.

[25] Kraay 1976: 45, 'For an island which possessed its own silver mines the coinage seems to have been on a surprisingly small scale.'

[26] I thank Zofie Stos-Gale for this information from ongoing metallurgical research.

[27] Davies 1935: 17 (*cf.* Gale & Stos-Gale 1981: 196; Étienne 1990: 204 Table 2).

[28] Fuchs & Floren 1987: 172; Treister 1996: 67 for Siphnian metalwork; Zofie Stos-Gale (pers.comm.) on processing (Snodgrass 1983 for bulk ore transport). Kray 1976: 45; Gale, Genter & Wagner 1980: 34-42 for the varied sources of Aeginetan silver coinage.

TOWER	LAND TYPE	TYPE OF ACTIVITY	DISTANCE
8	IV	GALLERY ENTRANCE	<10m
11	III	MINES	200m
13	II	MINES	350m
15	I	QUARRY	100m
16	II	QUARRY	100m
17	IV	MINES	200m
19	IV	ADIT ENTRANCE	100m
21	IV	ADIT ENTRANCE	100m
22	IV	ADIT ENTRANCE	100m
31	IV	GALLERY ENTRANCE	50m
47	II	MINES	50m
48	II	MINES	50m

TABLE 6.1: *Siphnian towers located near mines, galleries, quarries and areas of extractive activity.*

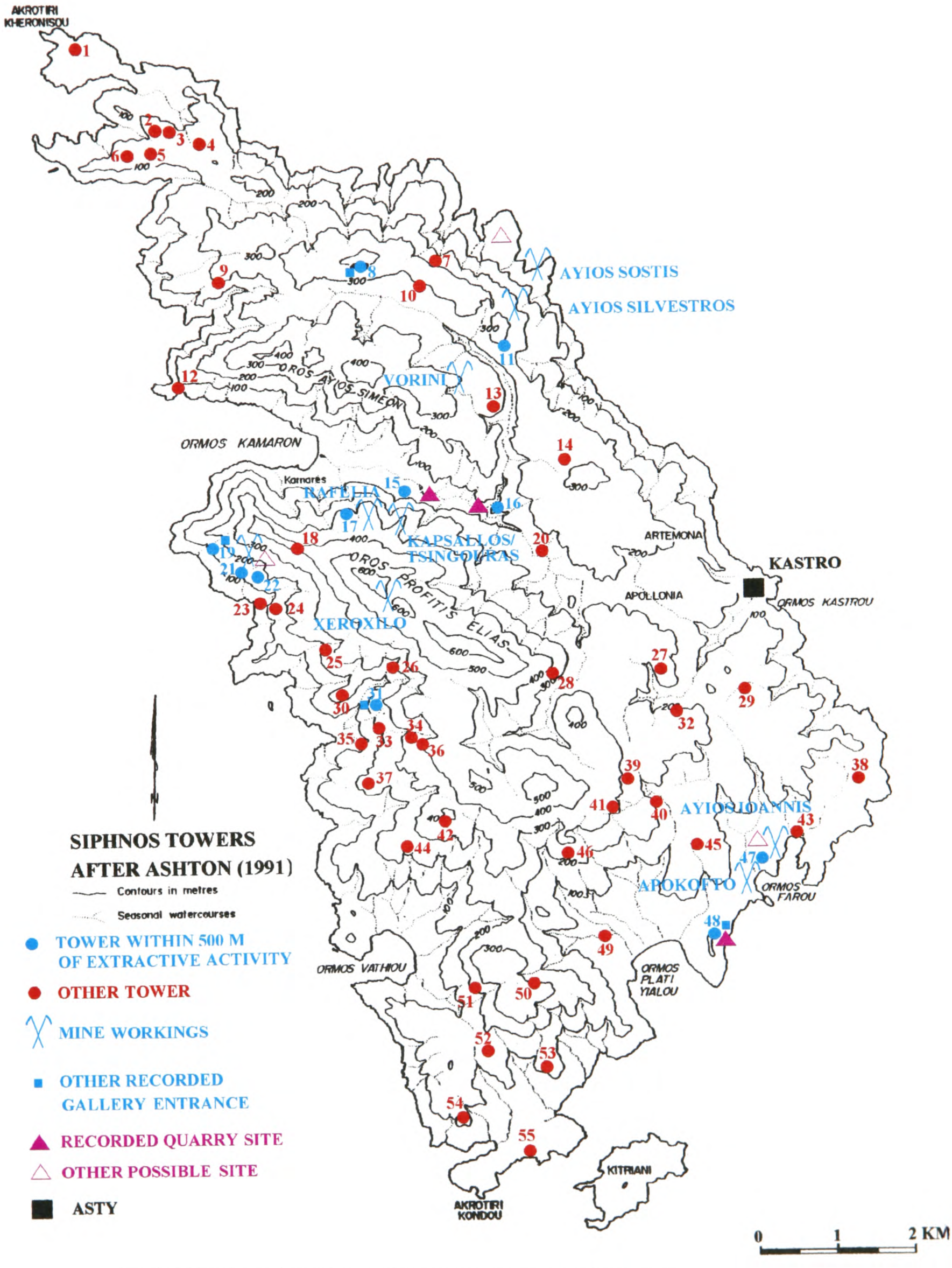

FIG.6.1: *Map of Siphnian towers in relation to mineral resources.*

security.[29] Nonetheless, only a limited number of Siphnian tower sites are located near ancient mines, galleries or other known areas of extractive activity (*Table 6.1, Fig.6.1*), nor is it exactly clear how such structures would relate to their operation, or whether such sites were contemporary with mining activity, but were situated nearby to take advantage of other kinds of land use (especially on the mountainside slope areas).[30] Therefore other means of rural primary production need to be considered with regard to the location of these sites.

AGRICULTURE

Local geology, hydrology, land type, slope gradient, aspect and altitude are all factors which may influence the cultivation of cereals, legumes, and arboriculture (either in monocultures or polycropped regimes) according to 'dry' or 'irrigated' techniques. The following section assesses the location of rural sites in relation to suitability for certain types of agriculture.

LAND TYPES

The suitability of land for certain types of cultivation is dependent upon the factors of land type (such as soil depth, size of grain and bedrock from which it is derived), which affect the root penetration of vegetation and drainage of the land (*Figs.2.3,6.2*).[31] A useful classification of land types (according to van Wersch 1972) can illustrate local variations in land potential; such an analysis compensates for post-antique environmental change by taking into account not only current soil cover, but also aspects of gradient and bedrock type which would also play a siginificant role in determining the suitability of land for cultivation.[32]

Lowlands

Class I land is the most fertile, with deep alluvial soil, natural drainage and the opportunity for irrigation, for example in the Kamares valley or around Plati Yialos bay, permitting cereal

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[29] On the needs of the metallurgical industries for a supply of good quality charcoal, see Meiggs 1982: 205-206. *cf.* Theophrastos *HP* V.9.1-3, who specifically singles out the activity of primary lead-silver ore smelting as an example of the consumption of the best charcoal (*cf.* Amigues 1993: 106-108). van Andel 1987 suggests that decline of Siphnian mining may have resulted from a lack of suitable native fuel supplies. If supplies had to be imported anyway, it is more likely that decline was due to a drop in ore output.

[30] Osborne 1986: 175 and Yoshiyuki 1993: 11 note that high numbers of low status workers introduced into rural areas would need supervision and control, and that towers may have exerted both a practical and symbolic effect in overseeing the work-force (however, see above pp.142-144). For other kinds of land use in the mountain areas around mine sites in the west of the island, see below p.201.

[31] Zangger 1992b: 15; Anastassiades 1949: 356; Bintliff 1977: 87-108. Theophrastos *HP* II.2.8, *CP* III.6.7 for the importance of soil and slope locality (*cf.* Semple 1928: 67).

[32] *cf.* Blitzer (forthcoming) on local soil variations between fields in the north of Siphnos. Zangger 1992b: 15 for the problems of scientific soil analysis when attempting to determine ancient soil fertility, including the contamination effect caused by recent manuring.

cultivation and arboriculture, together with the planting of legumes (which can replace nitrogen in the soil, allow intensive 'gardening' and avoid fallow). However, only 2 recorded sites (**15**, **49**) were situated in this type of land.

Class II land — generally fertile land comprising flat valley bottoms and gentle slopes suitable for ploughing — corresponds to the lower schist area in the south-east, in the Troulaki valley, and also the flatter areas of the upper schist layer in the north of the island which provides a water-retaining soil allowing good root penetration (*Fig.2.3*).[33] Cereals, arboriculture and viticulture are all suited to land in the south-east; however, the exposed nature of northern Siphnos appears to have limited arboriculture there.[34] Accordingly, rural sites in the south-east of the island (**14**, **20**, **27**, **29**, **32**, **38**, **39**, **45**, **47**) are predominantly located in this type of land which would have been highly suitable for arable cultivation.

In historical times, the island appears to have produced staples sufficient to support populations of 3,000-5,000, together with a variety of agricultural commodities — most notably large volumes of olive oil for export (one annual figure of 205 tonnes is recorded in the late 19th century), but also including smaller quantities of grapes, capers, sesame, callicoes, figs, onions, wax, honey and silk — which suggests intercropping of cereals with arboriculture, and intensive gardening,[35] especially since the impression of fertility was largely confined to the area of arable land in the south-east of the island where most travellers disembarked and subsequently stayed.[36] Relative lack of rainfall might favour barley, rather than wheat cultivation in this area.[37] However, hydrology enabled irrigation for legumes and arboriculture: fruits and vegetables were particularly praised for their quality and quantity as they were exported throughout the Cyclades.[38]

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[33] Bintliff 1977: 98.

[34] Bent 1965: 23-24 for the 'barren promontory swept by the northern blast'. For intercropping (e.g. vine/barley), Mossé 1969: 36. Recently viticulture was located in the Kamares and Troulaki valleys, around the Erkies water course in the south-east and Vathi bay in the west. Fruits and legumes are cultivated in small pockets of alluvial land or on relatively fertile soil by watercourses (*Figs.2.5-6*).

[35] e.g. Tournefort 1741: 184-185; Leake 1856: 157-158 for self-sufficient cereal production, commodity exports, and gardens. Gkion 1876: 164-165 for figures on olive oil production and export, which suggests an area at least 300 ha. dedicated simply to export (based on comparative figures of oil/ha. in Amouretti 1986: 291). Today, olive cultivation is most prominent in the Kamares valley, where the arrangement of stepped and braided terraces previously permitted cereal inter-cropping.

[36] Extolling the fertility of the south-east of Siphnos, Sonnini 1801: 264-265 for the 'excellent quality' of agricultural products; Bent 1965: 24, 'As each house has its own garden and olive orchard, and as green fields cover all the hillside, it was by far the most luxurious sight we had as yet seen in the Cyclades.' *cf.* above n.34 for the contrast with the north of the island.

[37] Amouretti 1986: 33-41; Gallant 1991: 79-81; Isager & Skydsgaard 1992: 21-43; Sallares 1991: 313-361 for conditions of cereal cultivation, and the better ability of barley to endure inter-annual variations in rainfall around 300-500 mm/year.

[38] Tournefort 1741: 184; Pasch di Krienen 1773: 113; Choiseul-Gouffier 1782: 15; Buchon 1911: 189; Semple 1932: 437. For hydrology, see above p.67.

However, although some monumental rural sites were located in this relatively fertile south-east area within 5 km of the *asty*, it is notable that the majority of sites were located elsewhere, on steeper slope gradients in upland areas in the west and north of island.[39]

Uplands

Class III land — hill lands and mountain shoulders of moderately fertile, shallow, non-calcareous soil — corresponds to small schist bedrock pockets which dot the lower slopes in the centre and west of Siphnos (*Fig.2.3*). Although often lying on relatively steep gradients (in excess of 30%), the soil allows root penetration. These areas of land can be cultivated for cereals or arboriculture, albeit with a higher input of labour for systems of soil and water retention.

Class IV land — typically dissected, rocky soil on marble/limestone bedrock with steep slope gradients — is distinctive for its *maquis* landscape of juniper, wild olive and thyme. Such locations, in particular the upland areas lying on limestone bedrock in western areas of the island beyond the mountain ridge of Profitis Elias (*Figs.6.2-3*), have often been associated with *eschatia*.[40] Although soil on crystalline limestone does not retain water as well as soil on impermeable schists and is generally shallow, arable cultivation is possible.[41]

This however, is dependent upon labour intensive methods of soil and water retention (such as terracing) in order to break up the soil and allow root penetration. 'Dry' farming systems (employing biennial fallow) might yield only modest returns for cereals; such land would greatly benefit from the use of fertilisers (such as manure) and irrigation. However, the land would be suitable for arboriculture (especially olive cultivation) and perhaps viticulture on the lower slopes, where slopes at higher altitude might be exposed to temperatures which might damage the fruit.[42] The decision to farm such an area would be a long term decision, especially in the case of olive cultivation. Selective use of shoot grafting and pruning of wild olives, might help 'reclaim' marginal land, but it would take upwards of three decades before domesticated trees began producing substantial harvests of fruit in biennial cycles.[43]

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[39] *contra* Nowicka 1975: 141, 'Dans l'île de Siphnos il n'y a que des tours rondes appartenant aux fermes isolées, très nombreuses sur les terrains fertiles, mais il n'y a pas de tours-refuges' (*cf.* Robert 1970: 598 n.8). Young's study, on which Nowicka was dependent, was to a considerable degree a reflection of his archaeological investigation in lower lying (and more arable) areas of the island. It is noticeable that Young failed to find or visit many upland sites recorded by Dragatsis (see *Table 3.2* above).

[40] See above pp.33-34. *cf.* Isager & Skdsgaard 1993: 72, 'even extremely infertile districts have made survival possible. This is a case of exploitation of the extreme marginal soil which, in antiquity, is often called *eschatia*.' van Andel & Sutton 1987: 11; Jameson, Runnels, van Andel 1994: 163 for *maquis* landscape.

[41] Rackham & Moody 1996: 29. Theophrastos *CP* II.4.2-3 on the suitability of thin soils for trees.

[42] For olive cultivation, Boardman 1977: 188; Forbes & Foxhall 1978; Amouretti 1986: 41-46; Sallares 1991: 304-309. Rackham & Moody 1996: 78 for the requirements of viticulture, especially terrace construction and a soil with good root penetration. Also Hanson 1992, 1995: 81-82 for *eschatia* and viticulture.

[43] Isager & Skydsgaard 1992: 36-38. Presumably, such 'reclamation' of marginal land would require later cutting and transplantation of saplings into organised rows.

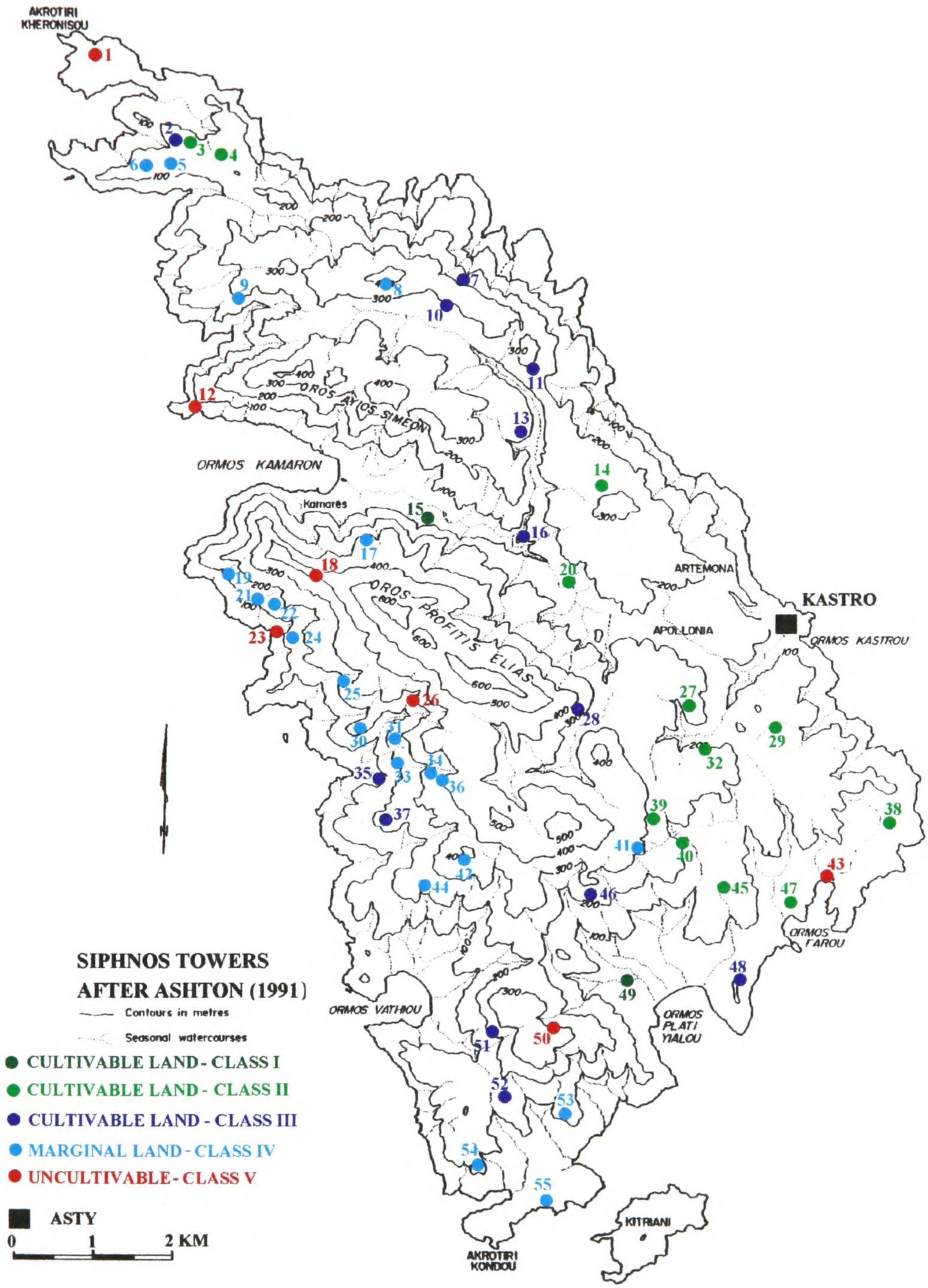

FIG. 6.2: *Land types at rural sites on Siphnos (see also Fig.2.4). N.B. cultivable land in east, marginal land on western slopes.*

Class I - alluvial slopes, high fertility, natural drainage, opportunity for irrigation.
Class II - generally fertile with terraceable slopes and flat valleys which can in some cases be irrigated.
Class III - hill lands, kampos, mountain shoulders of moderately fertile, shallow, noncalcareous soils.
Class IV - dissected kampos, rocky ridges with rocky and rough soil.
Class V - land extremities, gorges, mountain land, marshes, lagoons.
Typology after H.J. Van Wersch 1972.

Tower no.	slope direction	Gradient to nearest 5%	Land type	traces of terraces
14	plateau	<10%	II	below
27	plateau	<10%	II	
32	plateau	<10%	II	
38	plateau	<10%	II	below
55	plateau	<10%	IV	below
15	valley floor	<10%	I	
29	valley floor	<10%	II	
49	valley floor	<10%	I	
52	n-w→s-e	<10%	III	
47	n-w→s-e	15%	II	
3	s-e→n-w	15%	II	
36	s-e→n-w	20%	IV	
54	n-w→s-e	20%	IV	
17	s→n	25%	IV	
41	n-w→s-e	25%	IV	
42	n-e→s-w	25%	IV	
37	e→w	25%	III	terraces
2	s-e→n-w	25%	III	
4	n-w→s-e	25%	II	terraces
39	n-w→s-e	25%	II	terraces
11	n-w→s-e	30%	III	terraces
44	n-w→s-e	35%	IV	terraces
9	n-e→s-w	35%	IV	terraces
10	n-e→s-w	35%	III	terraces
45	n-e→s-w	35%	II	terraces
13	n→s	35%	III	terraces
6	n-e→s-w	35%	IV	terraces
20	n→s	35%	II	terraces
34	s-e→n-w	40%	IV	terraces
5	n→s	40%	IV	terraces
30	n-e→s-w	40%	IV	
31	n-e→s-w	40%	IV	
46	n→s	40%	III	terraces
35	s-e→n-w	40%	III	terraces
24	e→w	42%	IV	terraces
8	n-w→s-e	42%	IV	terraces
28	n-w→s-e	50%	III	terraces
51	n-e→s-w	50%	III	terraces
18	n-e→s-w	50%		
25	s-e→n-w	55%	IV	terraces
33	e→w	55%	IV	terraces
19	n-e→s-w	55%	IV	
21	n-e→s-w	55%	IV	
22	n-e→s-w	55%	IV	
48	s-e→n-w	55%	III	terraces
53	n-e→s-w	60%	IV	terraces
16		unknown	III	terraces
7		unknown	III ?	
40		unknown	II ?	

TABLE 6.2: *Rural sites in agricultural areas according to slope gradient, land type and traces of terraces.*

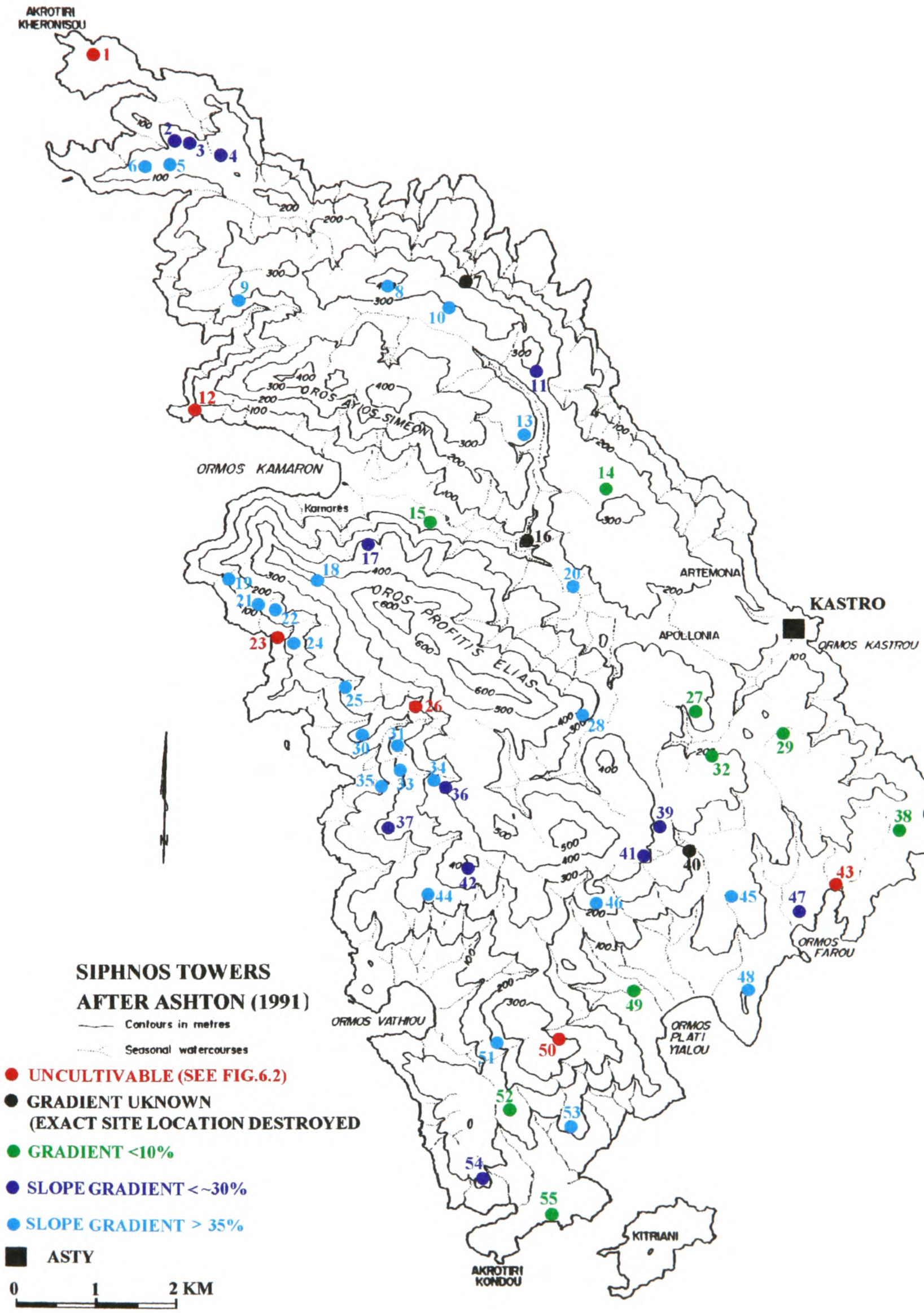

FIG.6.3: *Map indicating slope gradient at Siphnian tower sites (cf. Fig.6.2). N.B. sites with gradients of ~35% or more requiring artificial soil management (e.g. terracing) for arboriculture and/or cereal cultivation.*

Many tower sites in the north, west and south-west of Siphnos occupy land of *Classes III-IV* (*Fig.6.2*). Of the other site locations in these areas, *Class V land* comprises land extremities of bare rock (such as gorges, cliffs, knolls and promontories) which lack any soil and are highly unsuited to any kind of agriculture. This type of land formation occurs in several areas of northern and western Siphnos, most notably on the promontories of Kheronisos, Kavos Kokkalas at Kamares, Vlasi and Tsohka bays (**1**, **12**, **18**, **23**, **26**, **50**) and on the upper slopes of the Profitis Elias ridge above 400 masl.

SOIL MANAGEMENT SYSTEMS, SLOPE GRADIENT AND CULTIVATION

Soil Management

The density of well-built, rural sites in steep sloped, marginal areas of the Siphnian *chora* therefore deserves detailed consideration with regard to the kind of cultivation which could be practised there.[44] The general suitability of steep sloped land for arboriculture in managed soil systems has prompted a growing number of studies to suggest that specialised olive cultivation (perhaps with some inter-cropped cereals) was of fundamental importance to the economic geography of such areas in antiquity.[45]

Although studies generally agree on the high labour input required to cultivate and process these specialised cash crops, the use of soil management systems on slopes is debated.[46] The most common method of soil management is the use of stone terraces, which clear stones from the land, modify the natural slope gradient to provide the benefits of a flatter surface for water and soil retention and improve tilling conditions for crop cultivation.[47] Different types of terrace construction may be employed, according to the type of cultivation: stepped terraces (usually running parallel, and accessible by steps in the wall) offer a wide range of potential crop cultivation.[48] Braided terraces, which criss-cross up a slope, are especially suited to cereal

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[44] See *Table 5.4* for nearest neighbour analysis of sites.

[45] Yoshiyuki 1993: 10-11, 'the widespread traces of cultivation in the Attic-Megarian frontier show that an alternative way to acquire necessary farmland was to encroach the deserted temple estates or the no-man's land near the border. The hilly nature of the borderland made it possible to exploit rich microenvironments in a single tract of land without the aid of such adaptive measures as land fragmentation and/or crop diversification. Hence it was advantageous to develop a hilly countryside rather than a flat plain in order to manage a farm relatively specialized in the production of limited kinds of crops, particularly of olive.' Likewise Lohmann 1993a: 196-219 for Atene region of southern Attika. Halstead 1987: 33 on consolidation of land-holdings around rural sites.

[46] Low status labour on isolated, compact tracts of land, Osborne 1987: 70; Lohmann 1992: 51; 1993a: 218; Yoshiyuki 1993: 13. Isager & Skydsgaard 1992: 38-39 for doubts about labour requirements for some aspects of olive cultivation (see also discussion in Wells 1992: 131-133).

[47] Semple 1932: 440-441; Blanchemanche 1990; Rackham & Moody 1992: 124-125, 1996: 141.

[48] Rackham & Moody 1996: 142, 'Well-built terraces — high, and with good craftsmanship in the walls — go with vines, or with irrigated gardens for which a nearly horizontal surface is essential.'

cultivation since they enable plough access,[49] while pocket terraces (which surround individual trees and hence derive their name) are only suitable for arboriculture, since they leave the remainder of land between trees unworked.

However, a recent study (Foxhall 1996) has argued against the extensive use of stepped and braided terraces in ancient olive cultivation, and instead claimed that a *gyros* system of labour intensive inter-connected trenching and ditching around olives — in some ways similar to pocket terraces, although not extending to the explicit clearing of stones and construction of enclosing walls — which would effectively bypass the need for terraces, and would be especially suited to a non-subsistence specialised monoculture system,

> 'Such cultivation regimes for tree crops are the prerogative of the rich. Indeed, the development of sloping land for arboriculture, based on a trenching and ditching system, was probably advantageous for wealthy households aiming more at the generation of income rather than subsistence. These intensive arboricultural regimes were relevant to households where, although they were farming to supply their own needs, subsistence could be taken for granted and was not the main consideration. Hence the intercropping of annuals was also not a priority in these regimes, allowing the constant digging which obviated the need for terrace construction.'
> Foxhall 1996: 59

The thesis is based on a perceived silence concerning terrace cultivation in élite-orientated literary sources, and is developed to challenge archaeological evidence for the widespread existence of terraces in ancient Greek arboriculture.[50] In support of the thesis, it is suggested (from the evidence of survey on Keos) that ancient rural sites tended to occupy locations where the slope was less than 15 degrees (or approximately 30% gradient), thus allowing cultivation without terrace systems.[51]

However, all three aspects of the thesis require re-evaluation. Firstly, the 'silence' of ancient literature (in Foxhall's case, primarily Homer and Hesiod) must be qualified by the general lack of precise agricultural terminology in extant written sources.[52] Even so, written sources are arguably not as silent on the subject as suggested. The reference to wall (αἰμασια) construction in *Od.*

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[49] Wagstaff & Gamble 1982: 101 suggest that a 5% gradient is the limit for ploughing; however Rackham & Moody 1996: 141 cite an example of ploughing at 15° (~30%) gradient.

[50] Foxhall 1996: 45-60 *contra* Bradford 1957 on the identification of 'ancient' terrace systems on the slopes of Mt. Hymettos in Attika. Foxhall 1996: 44 admits that terrace techniques were probably used in antiquity, but wishes to limit its use to subsistence orientated production by poorer households.

[51] Foxhall 1996: 64, 'The only systematic study so far that has attempted to correlate the occupation of rural sites with the angle of slope (Whitelaw forthcoming) in fact suggests that ancient farmers preferred to avoid slopes that needed extensive terracing. Whitelaw has clearly shown that on Keos most of the small "farmstead" sites of the classical period are situated on slopes of less than 15 degrees, which would probably not need terracing under the systems of cultivation outlined above.'

[52] Isager & Skydsgaard 1992: 4. Indeed, the premise of the argument relies upon the 'élite orientation' of epic sources; for a different view, see Dalby 1995 *contra* Finley 1978: 91.

XVIII. 357-359 is ambivalent, and may or may not be an oblique reference to terrace building in *eschatia*, but it does not prove lack of interest in terrace cultivation by the elite.[53] The four rural walls sold as property on Tenos (*IG* XII 5, 872.32) might be argued to be field walls rather than terraces.[54] However, given the attempt to differentiate such structures from 'the land (χώρα) down below by the garden (κῆπος)', it does appear that some specialist use was meant in this context.

Secondly, and more decisively, much archaeological evidence for ancient terrace cultivation (often around well-built, monumental rural sites) is in direct contradiction with the major arguments put forward in the 'trenching' hypothesis. The evidence from towered 'farmstead' sites in the Atene region of southern Attika is questioned by Foxhall, on the grounds that the masonry of the terrace walls identified by Lohmann is too well preserved and unweathered to date from antiquity, although this argument is not conclusive given the high quality of ancient masonry preservation elsewhere.[55] However, evidence from many other areas of the Aegean (not discussed by Foxhall) must also be considered.

On Keos, another surface survey has reportedly recorded at least two ancient tower sites in hilltop locations on the south-eastern area of the island, where walls 'bond' with (presumably aligning) terrace walls. However, until site plans of the towers at Pighadaki and Houchli are published, it is impossible to know the exact orientation and alignment of the respective structures.[56]

Some of the most extensive evidence is preserved on the island of Delos. Terrace ruins are especially prevalent on the eastern side of the island, but also exist in the north and south. A number of ancient rural buildings in the vicinity align with these terrace walls.[57] Brunet has argued that while field (enclosure) walls, absent from maps of the island in the early part of this century, are likely to be modern constructions, the terraces belong to the Classical-Hellenistic period, on the basis that this was the only time in the island's history where necessary socio-economic conditions for large-scale terrace cultivation prevailed.[58] The large, regular, polygonal masonry of the terraces, and Classical Hellenistic pottery finds at ancient rural buildings abandoned in later antiquity, are taken as corroboration of an explicitly ancient date for the Delian terrace walls.[59]

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[53] Jameson 1977/8: 128 n.32. Étienne 1990: 25; Brun 1993: 229 n.18 on the terminology of αἰμασία.

[54] αἰμασιὰς τέτταρας αἳ εἰσιν ἐπάνω τῆς χ[ώρ]ας τῆς κάτ[ω] πρὸς τῷ κήπῳ ὡς ὁρίζει ἡ ὁδὸς ἡ ἀν[ω ἄγουσ]α καὶ κάτω [ποτα]μὸς.

[55] Foxhall 1996: 62-63 *contra* Lohmann 1993a: 166-173 arguing for terraces at tower sites in Atene as part of olive growing estates.

[56] Mendoni 1994: 157 n.85 for preliminary notes.

[57] See site plan of an (unspecified) Delian rural building and aligning terraces, Brunet 1990b: 9 fig.2.

[58] Brunet 1988a: 334-339; 1990a: 670, 682; 1990b: 6-7; 1992: 43-4.

[59] Brunet 1990b: 8-9.

Elsewhere, in the Crimean countryside of Chersonesos Taurike, terrace systems for arboriculture were a normal feature of well-built farmstead plots,[60] and it is also worth noting that aligning terraces (together with stone press installations) are also found below impressively built hill-top Lykian tower-complexes.[61]

Thus, archaeological evidence for the involvement of wealthier households in terrace arboriculture systems cannot be so easily dismissed as an argument from silence which matches the silence of literary sources; instead the existence of 'a sophisticated and refined technique of terracing with a view to extending the arable area' ought to be considered an acceptable method of soil management in antiquity.[62]

Slope gradient

The third, and most substantive argument against the trenching hypothesis is provided by the specific evidence of slope gradients at Siphnian sites, which offers a very different picture to the location of rural sites in the Keian study of Whitelaw, and tempers any suggestion that rural sites were strategically sited to avoid gradients in excess of 15° (approximately 30%) in order to pursue terrace-free cultivation.

The least slope gradient (i.e. a best case scenario) was calculated around all currently known tower sites on Siphnos (*Table 6.2*, *Fig.6.3*).[63] The results clearly indicate that only a select number of sites in the flatter southern and eastern parts of the island (**27**, **29**, **32**, **38**), together with those located on valley floors, gentle slopes or plateaux (**15**, **29**, **49**, **52**, **55**) would have been suitable for arable cultivation without an extensive terrace system. The slope gradient at the majority of sites is much steeper, well in excess of the 30% gradient considered crucial for 'trenching' arboriculture.[64]

The gradient analysis of Siphnos tower sites therefore suggests either that a terrace system of hillside soil management would have been a necessary pre-requisite of any agricultural activity at these locations, or that arable cultivation was not practised at these steep lying sites. This is not to suggest that all terraces (predominantly of the stepped type) visible today in some tower locations

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[60] Saprykin 1994: 26-28; also Pečírka 1970: 474.

[61] Zimmerman 1992: 96; Konecny 1993, 1994 interpreting the structures as domestic, agricultural buildings.

[62] Isager & Skydsgaard 1992: 81-82; also James, Mee & Taylor 1994: 406 fig.10, 412 for terraces tentatively dated to the classical period in Methana.

[63] Gradients may be classified in three groups: flat land (less than 10% gradient), slopes between 10-30% gradient (i.e. permitting trench systems) and those in excess of 30% gradient. Gradients were estimated on a 20m contour map (Birkett-Smith 1995). Vertical, rather than horizontal distance was chosen as a constant and the least gradient over 20 vertical metres above and below (or 40m below if the tower stood on an eminence) was calculated. It should be stressed that, for the sake of argument, these figures are the *least* gradient; in fact locations where the least slope was calculated at less than 30% gradient were often immediately surrounded by much steeper slopes.

[64] *cf.* the steep gradient of slopes around Lesbian rural enclosures (Spencer 1993: 90; 1995c; below Appendix 2.5).

are ancient (*Table 6.2*); indeed some walls cut through towers (**22**, **35**, **46**).[65] However, what it does emphatically corroborate is the need for terrace systems in order to cultivate these steep sloped areas.

The archaeology of arboriculture

The economic importance of arboriculture, both in its direct fruit produce, and also in its associated farming benefits (for example the use of trees as wind-breaks, allowing inter-cropping, and assisting the stability of well-built terraces) may be judged with respect to the remains of processing equipment at several monumental rural sites on the island (*Table 4.9*), and its consequences for our understanding of local land use in marginal areas.[66]

Although there are problems in the identification and dating of agricultural implements (especially crushing and pressing equipment),[67] which means that *Table 4.9* ought to be read only as a general indicator of the agricultural infrastructure deployed at these sites and the kind of agricultural activities which might be practised in their vicinity, the importance of *storage* in the archaeology of arboriculture (and especially olive processing) is salient.[68]

The materials required for the three processing stages in olive oil production after the fruits had been harvested — crushing (grinding equipment), pressing (press mechanism and weights) and separation (run-off storage vessels) respectively — together with ceramic storage vessels for transport of the olive oil were bulky items (not to mention the harvesting equipment).[69] This factor is brought into sharper relief when the seasonal and cyclical nature of olive cultivation is considered. The olive harvest occurred annually in the winter months, but the fruiting of each olive tree was geared to a biennial cycle of alternate high and low yields during its long life-span; thus there could be potentially large inter-annual variations between harvests, and consequent variations in annual processing and storage requirements.[70]

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[65] See Ashton 1991: 80-81 (**22**), 106-107 (**35**), 128-129 (**46**). Siphnian terraces are typically 5-6 m in width.

[66] Riedl 1983:17 for the use of trees as wind-breaks.

[67] e.g. Bruneau & Fraisse 1981; 1984; Bruneau 1987; Isager & Skydsgaard 1992: 53-66; Saprykin 1994: 18; Foxhall 1997 for identification and discussion of agricultural processing equipment. For an example of the difficulties of identification, Munn 1983: 64 n.19 for a re-interpretation of the 'grain millstones' found by Lord at Argolid blockhouses (Lord 1938: 507 fig.32; 1939: 82 & figs.2-3; 1941: 95, 99 fig.9, 108) as late Roman olive press beds.

[68] The lack of any pressing equipment in assemblages at Atene towered sites (Lohmann 1993a; Foxhall 1996: 62) is perhaps symptomatic of the general paucity of material at towers, rather than an argument against classical olive cultivation in the area. See Cameron 1993; Joyce & Johannessen 1993 for the effects of discard and orderly abandonment on artefact deposition and re-use of materials which may render such ancient activities archaeologically invisible. Forbes & Foxhall 1978: 42 for the archaeological invisibility of wooden components in presses (e.g. the beam of the press).

[69] Drachmann 1932 (but no discussion of storage/run off devices); Foxhall & Forbes 1978: 42 for crushing/pulping, pressing and separation procedures; White 1984: 67-72.

[70] The anecdote recounted by Aristotle (*Politics* 1259a) about Thales of Miletus and his monopoly of the olive presses at harvest (thanks to a perspicaciously small payment the previous winter) illustrates the seasonal importance

Ethnoarchaeological attempts to quantify ancient olive and grape harvests and the requirements of processing equipment currently contain too many uncertain variables (for example, size and age of trees, distance between individual trees, and capacities of ancient pressing equipment) to hazard an estimate of the arboricultural 'productivity' around steep sloped Siphnian sites.[71] Nonetheless, comparative archaeology usefully confirms the importance of component processing equipment in rural agricultural activities. Indeed stone presses might form part of multi-purpose, component implements subject to seasonal assembly and disassembly for different jobs (e.g. olive processing or grape crushing).[72]

Although press equipment is found in urban contexts, such as at Halieis in the Argolid,[73] not all farmers might choose to transport their harvest to the *asty* for processing; indeed the time pressures of the agricultural year might make on-site processing a more likely alternative, especially at a location where there was already considerable investment in a secure agricultural building complex, and sufficient available labour. Thus a component assembled, *in situ* fruit processing installation such as at **22**, **48** (and possibly at **11**, **13** and **29**) may be considered as a *investment* geared to rural agricultural productivity, matching the investment of a monumental building in areas of considerable economic potential, given sufficient labour input.[74]

In conclusion, the hypothesis (first put forward by Young) which connected monumental rural sites with farming activity must now be qualified by a more sensitive reading of micro-regional environmental factors giving due importance to upland and steep sloped areas in the economic geography of the *chora*. While conspicuous rural construction might be anticipated in the more naturally fertile, and gentle sloped south east of the island around the *asty*, the intensity of investment witnessed on the soil managed mid-slopes of predominantly limestone mountain slopes — with small, but rich pockets of schist soil on the lower slopes enriched by local hydrology — attests the intensive exploitation of this marginal land on the west coast. However, in the vertical landscape above these sites, on the upper mountain slopes 400 masl, lay large amounts of even more marginal, and indeed uncultivable land, most notably the dominating mountain ridge of

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of such equipment, even if it ultimately tantalises about rental arrangements for certain agricultural implements in the *polis*. Boardman 1977: 188; Forbes 1992 for alternate fruiting years and accompanying strategies of processing.

[71] Forbes 1992 for ethnoarchaeological data on olive yield and processing capacities.

[72] Foxhall 1993a: 183 (*cf.* Sordinas 1971: 5 on wooden beam press).

[73] Isager & Skydsgaard 1993: 68; Ault 1994.

[74] Rackham in Wells 1992: 101; *viz.* press block lying within Kheimarrou tower enclosure, Naxos (Haselberger 1983: 56, photo 32). It is worth noting that arboriculture without a terrace system might have been possible at **29** and possibly at **11**, but would certainly have been required at **13**, **22**, and **48** (*Table 6.2*). *cf.* Schaus & Spencer 1994: 424-430 on the relationship between terraces and ancient Lesbian viticulture; Osborne 1987: 107, Brunet 1992: 45 on the importance of viticulture in the towered Thasian countryside. Young 1956a: 140 was the first to argue that terraces near some island towers suggested cultivation of the grape.

Profitis Elias which ran from the bay of Kamares southwards and ultimately south-west to the bay of Vathi, effectively separating the more fertile east from west.

The following section considers evidence for land use strategies in the *locales* of steep sloped upland sites, where agriculture (on the lower and mid-slopes) may have only been one component of ancient farming practised there.

ANIMAL HUSBANDRY

> *Mons horridus silvestribusque frondibus umbrosus et in primis altus fuit. Huius perobliqua devexa, qua saxis asperrimis et ob id inaccessis cingitur, convalles lacunosae cavaeque nimium spinetis aggeratae et quaqua versus repositae naturalem tutelam praebentes ambiebant. De summo vertice fons affluens bullis ingentibus scaturribat, perque prona delapsus evomebat undas argenteas, iamque rivulis pluribus dispersus ac valles illas agminibus stagnantibus irrigans in modum stipati maris vel ignavi fluminis cuncta cohibebat. Insurgit speluncae, qua margines montanae desinunt, turris ardua. Caulae firmae solidis cratibus ovili stabulatione commoda porrectis undique lateribus ante fores exigui tramitis vice structi parietis attenduntur. Ea tu bono certe meo periculo latronum dixeris atria. Nec iuxta quicquam quam parva casula cannulis temere contecta, quo speculatores e numero latronum, ut postea comperi, sorte ducti noctibus excubabant.*
> Apuleius *Metamorphoses* 4.6
>
> 'The mountain was rugged, shaded with wild foliage, and tall in the extreme. Gullies which were closed on all sides and full of hollows, piled to bursting with thorn bushes and offering natural protection — isolated by whatever route — surrounded the mountain's precipitous slopes, where it was ringed with jagged and for this reason inaccessible rocks. From the highest peak a flowing spring gushed out in giant bubbles, rushed down headlong, and would erupt forth silvery waves, then separating into several streams and flooding the gorges with stagnant pools it filled the whole area like a lagoon or a lazy river. Above the cave, where the edges of the mountain give out, rises a lofty tower. Strong animal folds of solid wickerwork suitable for penning sheep stretched out with sides extended in all directions before the entrance in the manner of a narrow path formed by a wall laid in courses. You can take my word for it that here were the halls of robbers. Nor was there anything nearby except a small hut carelessly thatched with reeds, where, as I later learned, lookouts chosen by lot from the band of robbers kept watch at night.'

The landscape of Roman Achaea conjured by Apuleius offers more than just colourful Greek archaisms embedded in a later Latin novel.[75] Perhaps indicative of the state of abandoned, upland sites located on the uncultivated mountain slopes, the towered remains of erstwhile pastoralists were imagined in the Latin novel as ancient, rustic, and rather romantic hideouts for another set of dwellers occupying a marginal social and geographic position in the ancient world: along with banditry, animal husbandry offered a means of cultivating the uncultivable,[76]

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[75] On the 'solidly realistic background' of Apuleius' novel and its Greek narrative kernel in [Lucian's] *Lucius or the Ass* (although the description of the robbers' quarters is passed over in [Lucian] *Lucius or the Ass* 20), see Millar 1981: 63, 75, 'For the historian, the *Golden Ass* depicts levels of social and economic life which the vast mass of surviving Classical literature simply ignores...above all it offers us alternative models — of the operations of justice or the nature of economic life outside the towns — to those which we generally accept.' Also Munn 1983: 89 n.170.

[76] Thus, Aristotle's placement of pastoralism (βίος νομαδικός) below banditry (βίος ληστικός) in his 5 modes of subsistence (Shaw 1982-3: 16). Jameson 1989; Forbes 1996: 69 on the exploitation of the mountains in Greek *poleis* (e.g. *Iliad* XIX.375-377; *Od.* XIV.100-104; Hesiod *Works and Days* 235-237). Bremmer 1986: 256-257, Buxton 1992, 1994: 81-96 for the (largely negative) representation of their inhabitants, especially pastoralists, in

> 'One way of making what, as far as humans are concerned, is actually a very large inedible proportion of the Greek countryside (both cultivated and uncultivated) into something edible is to convert it via the medium of herbivores, especially sheep and goats. These provide not only food in the form of meat and milk, but also hides, wool and hair...[another reason for] the exploitation of animals is the need for manure to improve soil fertility in arable agriculture and arboriculture: this is provided not only directly by animals grazing on agricultural land, but also through the spreading of manure collected from folds onto the fields of agro-pastoralists, and even through its sale by pastoralists to agriculturalists.'
> Forbes 1995: 329

In certain parts of the Mediterranean at least, a clear connection was made between the construction of monumental rural sites and the use of uncultivable land for animal husbandry, actions which were implicitly involved in the exercise of elite power (in contrast to Aristotle's ideological polarisation of animal and agriculture in nomadic and sedentary modes of subsistence).[77] In order to relate the archaeological evidence of specific sites within a wider model of animal husbandry, the material evidence (and its archaeological invisibility) is first discussed, before moving to consideration of the types of animal husbandry which some Siphnian sites appear to indicate.

ARCHAEOLOGICAL EVIDENCE FOR PASTORALISM

> 'Pastoralists rarely write their own history.'
> Koster 1977: 155

While literary terms for animal enclosures and folds (ἔπαυλις, ἔπαυλος, ἔπαυλιον, στάθμοι) might arguably refer either to transhumance or agro-pastoral husbandry, archaeological identification of ancient Greek pastoral sites, and interpretation of associated husbandry regimes has proved more difficult.[78] This is because the essential mobility of animals and herders, and the perishable nature of animal produce, makes archaeological identification problematic.[79] However, the relative invisibility of diagnostically 'pastoral' materials (in comparison with the preservation of agricultural implements, processing equipment, storage vessels or terrace walls) may create a 'masking effect' which biases rural site interpretation towards an exclusively agricultural function,

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literary sources (*cf.* the tower dwelling *latrones* of Livy XXII.19.6). For transhumance and agro-pastoral husbandry, see above, pp.36-39.

[77] 2 Chronicles 26.9-10, '[9] Moreover Uzzi'ah built towers in Jerusalem at the Corner Gate and at the Valley Gate and at the Angle and fortified them. [10] And he built towers in the wilderness, and hewed out many cisterns, for he had large herds, both in the Shephe'lah and in the plain, and he had farmers and vinedressers in the hills and the fertile lands, for he loved the soil.' *cf.* Meyer 1920: 100. N.B. Cretan *mitato* and *tyrospita* (substantial round buildings with corbelled stone roofs used for cheese production and storage respectively). For the dimensions of *mitato* and *tyrospita* (usually in excess of 4m diameter, and 1m thick walls), see Warren 1973: 449-453; Carpenter & Boyd 1977: 190 n.44.

[78] See Isager & Skydsgaard 1992: 100 for discussion of ancient Greek terms relating to pastoral structures.

[79] Isager & Skydsgaard 1992: 101.

thus skewing interpretation towards an overly 'arable' picture of land use, even in steep sloped, thin soil, limestone bedrock areas.[80]

Archaeological traces of animal storages and shelters provide the best indication of husbandry around a site. Unfortunately (as in the case of Apuleius' romantic description) wooden structures would be rendered archaeologically invisible, and only careful analysis of stone structures may supply vital clues about animal husbandry. Chang and Koster have attempted to identify several architectural features and field structures which may individually or collectively indicate pastoral activity (*Table 6.3*). However, as ethnoarchaeological comparison of animal enclosures indicates (*Fig.6.6*), only the presence of distinctive animal enclosures — curved adjoining walls of a pen or fold, rather than a regularly planned outbuilding — is diagnostic from other types of farming (e.g. agriculture) which might require storage buildings, water devices or field walls (e.g. for apiary), or even larger animal shelters for cattle stalls.[81]

Nonetheless, archaeological survey in the last two decades has highlighted the presence of ancient upland sites which display these criteria. Traditionally assumed to be military fortifications on the basis of architecture alone, the locations of these well-built sites (often featuring a tower as the focal point of the complex) often belie straightforward, 'strategic' interpretation. Recent re-evaluations of upland sites in the border areas of north Attika, Boiotia and the Megarid, as well as on several Aegean islands indicates this shift in interpretation which has acknowledged the implicit military topographic bias of much earlier work.

At the mountain site of Panayia in northern Attika, a tower with limited viewshed overlooked a complex of rooms and extensive enclosure walls, which were fitted with jamb gateways 0.8-1m wide (*Fig.6.8*). Long rubble walls extended across and down the slope, and traces of terraces were also identified.[82] Other similar sites in the area include the Aigaleos, Karydhi, Mylos, Kyparissi and Mikros Kryphtis tower enclosures, situated on steep upland slopes on limestone formations, with curved walls often extending in discernible hooks around the towers (*Figs.6.9, 6.11a,b*).[83] In addition, other enclosures in Attika and the Megarid, once considered 'military' posts, have also

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[80] Forbes 1995: 334, Forbes 1996: 71.

[81] Chang & Koster 1986: 111-119. Rackham & Moody 1996: 150-152 for uses of field walls. Lohmann 1993b: 117-118 for rectangular building (14.5 m x 5m) adjacent to Thimari tower site in south Attika, interpreted as cattle stall.

[82] On the 'limited outlook' of the tower, see Ober 1985: 174. Munn 1983: 437 observed, 'Not only are the walls slight in size, but their plan does not suggest that they were laid out for military or defensive purposes. The only obvious explanation — that these walls are field or property boundaries, and that the many terraces found round about were built to hold cultivable soil - is not an easy explanation, not only for the walls, but for the slope tower as well — namely, that these are all constructions connected with the economic exploitation of this rocky countryside, perhaps for the growing of some crops, or perhaps for the grazing of animals within closely delineated areas.'

[83] The arrangement around the Karydhi tower bears more than a passing resemblance to the Apuleian tower enclosure (albeit in stone walls). *cf.* the rural tower enclosure at Kisla Dag, Halikarnassos (Radt 1970: 110 fig.11). Generally, see Rostovtzeff 1923: 373-4 on animal husbandry by Persian landowners focused around τύρσεις.

demanded a more sophisticated re-interpretation in the light of domestic evidence.[84] Rubble walls which adjoin or run tangential to rural towers cannot simply be ascribed as 'fortification walls': they are just as likely to indicate field walls (for example on Karystos) which may be connected with animal grazing.[85]

The 'strategic' function of upland tower enclosures on Andros and Lesbos (*Fig.6.7*) has also been questioned with regard to the use of enclosure walls as seasonal animal shelters, rather than military defences on the grounds of plan shape.[86] The quality of masonry work invested in the construction of an extensive building complex on the steep, thin soil slopes of Mount Aipos on Chios (*Fig.6.11c*) is also typical of *eschatiai* exploitation in which animal husbandry appears a likely component.[87] Elsewhere in the Aegean, earlier topographic site reports can provide tantalising mention of enclosure walls which appear more suitable for animal husbandry than fortification.[88]

In the context of the above architectural and locational information, the adjoining and adjacent walls present at many Siphnian tower sites therefore deserve consideration with regard to animal husbandry. It might be argued that such walls may have been added by shepherds in periods of re-use from later antiquity onwards. However, the masonry course style and close fit of wall bonding at the majority of sites strongly suggests that these wall traces formed part of the original site construction.[89]

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[84] e.g. Ober 1985: 173 for 'Tower on Hill 503' in northern Attika (see Appendix 3.2), which contained *pithoi* and roof-tiles, together with the foundations of a circular platform (threshing floor) adjacent to the tower.

[85] Ober 1983: 392 n.19. For field structures on Karystos, see Keller & Wallace 1988 (*cf.* Hasluck 1909: 10-11 for a description of field walls around a mountain spur tower on the island of Marmara.

[86] Forbes 1995: 337 for tower sites on Lesbos related to animal husbandry (*cf.* Labarre 1996: 227-234 on the significant pastoral element in cadastres recorded from Roman imperial period on Lesbos). Koutsoukou & Kanellopoulos 1990: 162 for the tower enclosure at Hellenikon-Choreza (Andros). The towered enclosure at Dhema in the Doris-Phokis corridor (Kase, Szemler, Wilkie, Wallace 1991: 56-59) might also be added to the list of 'military' sites which deserve a closer re-examination with regard to pastoral economics.

[87] Lambrinoudakis 1986: 303-4; Semantoni-Bournia 1987; Isager & Skydsgaard 1992: 72; Jameson 1994a: 63.

[88] *viz.* Cook 1958-9: 5 on a rural site outisde Smyrna, 'They seem rather to be simple buildings, cottages or barns, roofed with tiles of the same kind as the mansion. The other walls of this complex, too, can hardly be interpreted as fortifications. Both the poor quality of their masonry and the relatively small volume of fallen stones show that they cannot have stood much higher than 1.5 metres. Apart from one which encircles a large cistern to the north of the fort itself, they must rather have served the purpose of providing pens for flocks that were presumably part of the economy of this curious mansion-fort.'

[89] For these structures, see above Ch.4.

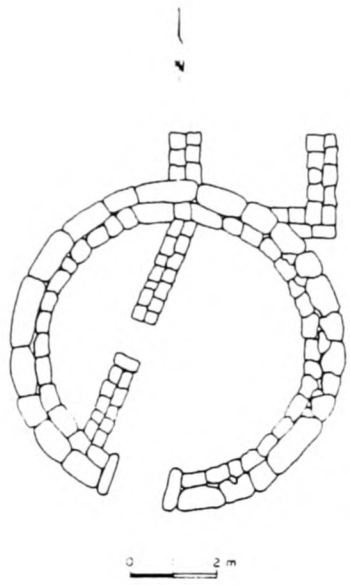
ARCHITECTURAL REMAINS
habitation buildings
animal shelters/enclosures
storage buildings
wells/springs/cisterns/troughs

FIELD REMAINS
pasture field walls
animal trails

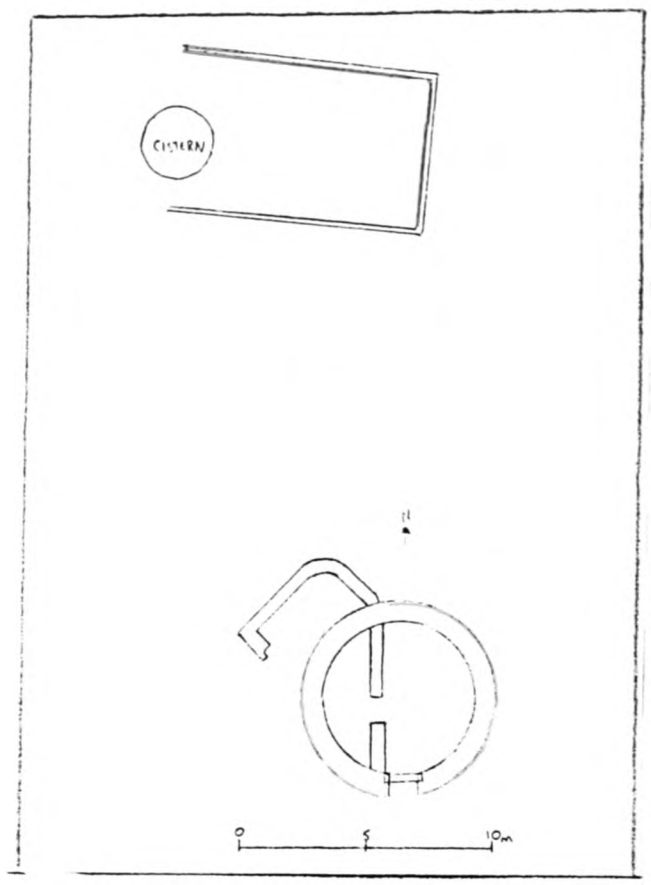
TABLE 6.3: *Criteria for identifying pastoral activity at rural sites after Chang & Koster 1986: 111-119.*

		FEATURES SUGGESTING	
LOCATION	RURAL SITES	POSSIBLE PASTORAL ACTIVITY	REFERENCES
ANDROS	Hellenikon-Choreza*	enclosure walls	Appendix 2.2
ATTIKA	Aigaleos*	oval rubble circuit wall 19 m x 13 m	Appendix 3.2
	Ayia Triadha Myrini*	adjacent building; rubble circuit wall 30m x 25m, 2m thick	Appendix 3.2
	Karydhi*	rubble walls 30m x 27m; adjacent square building 3m x 3m	Appendix 3.2
	Mylos*	rubble circuit wall 33m x 25m	Appendix 3.2
	Panayia*	extensive rubble wall enclosure north of tower	Appendix 3.2
	Pyrgari*	adjacent round platform 7m diameter; rubble walls	Appendix 3.2
	Vari House*	courtyard; stable/shelter; field walls	Appendix 3.2
CHIOS	Mt. Aipos	buildings, enclosures	Lambrinoudakis 1986; Semantoni-Bournia 1987
EPHESOS	Aladagh	adjoining enclosure	Benndorf 1906: 81
HALICARNASSOS	'Farmhouse'	adjacent curved enclosure wall	Bean & Cook 1955: 132-4
KEOS	Tourkou*	enclosure	Appendix 2.3
	Psaropyrgos*	enclosure, field walls	Appendix 2.3
LESBOS	128*, 131*, 151*, 193*	enclosure walls, cisterns, buildings	Appendix 2.5
	205*, 235*, 237*		
LYKIA	Gök Liman*	adjoining enclosure	Appendix 3.5
MARMARA	Kastrakia*	parallel coursed stone walls running downhill from tower	Appendix 3.5
MEGARID	Kyparissi*	courtyard; enclosure wall; cistern	Appendix 3.2
	Mikros Kryphtis*	courtyard; enclosure walls; cistern	Appendix 3.2
THASOS	Gravousa*	enclosure	Appendix 2.6
	Avatsinia*	enclosure; spring	Appendix 2.6
	* = TOWER SITE		

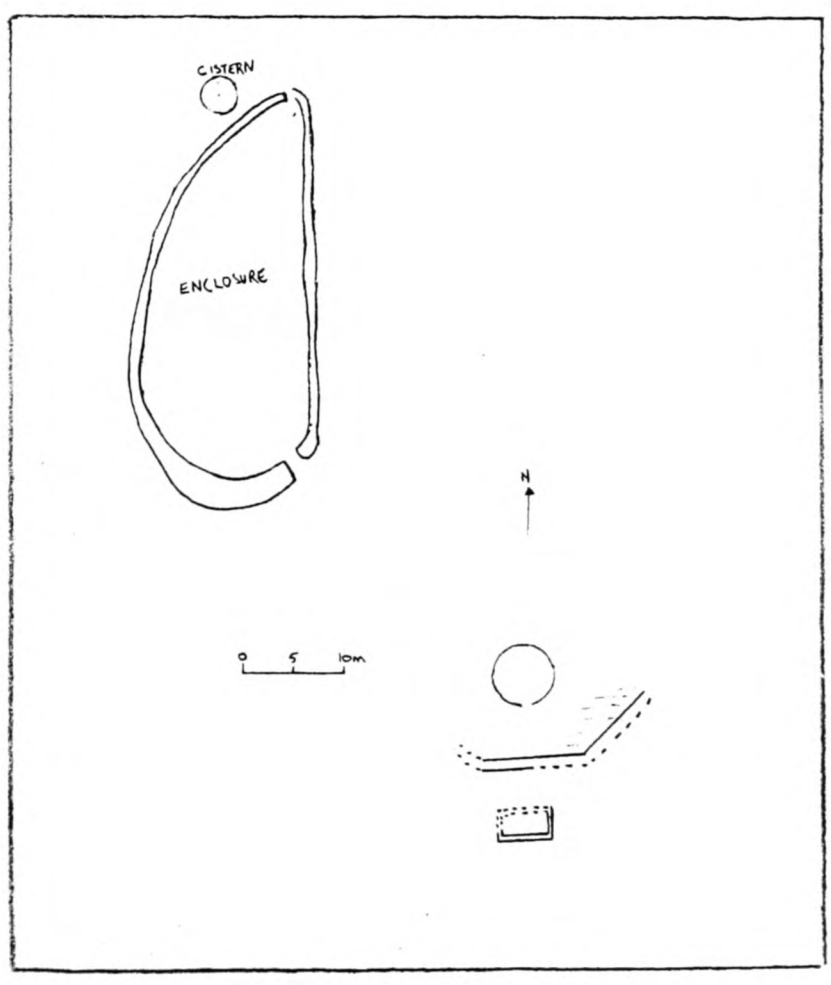
TABLE 6.4: *Rural (tower) sites in marginal locations exhibiting features associated with pastoral activity (see above Table 6.3).*



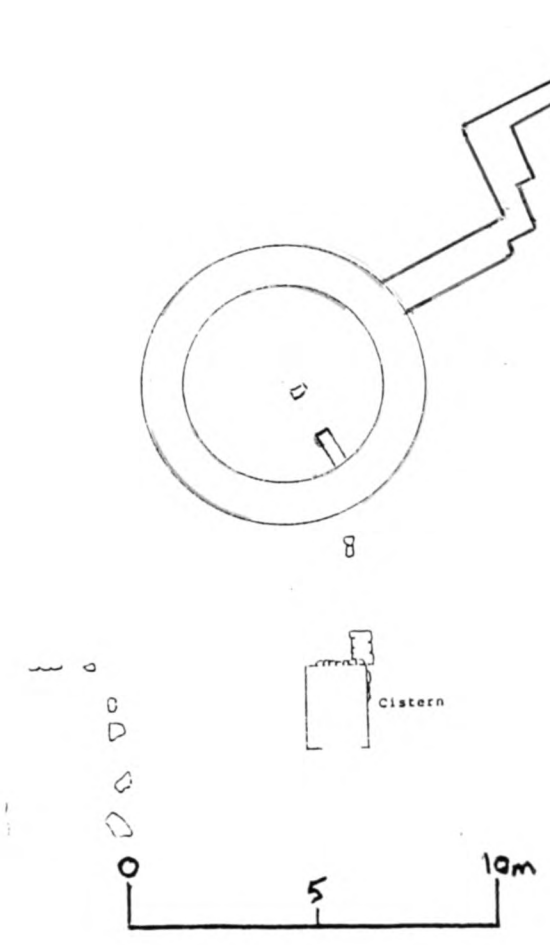
9 (Ashton 1991)



21 (GND)

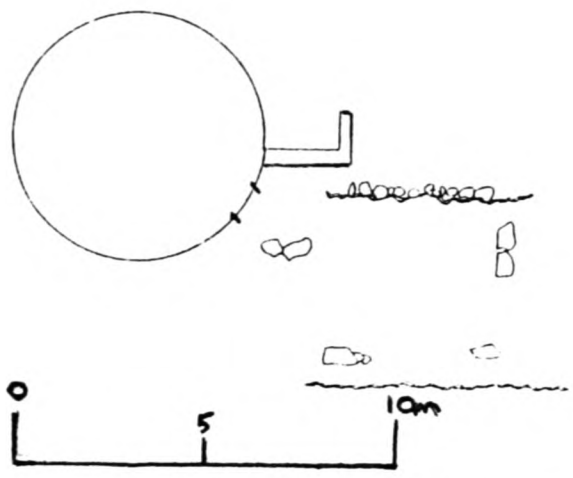


30 (GND)

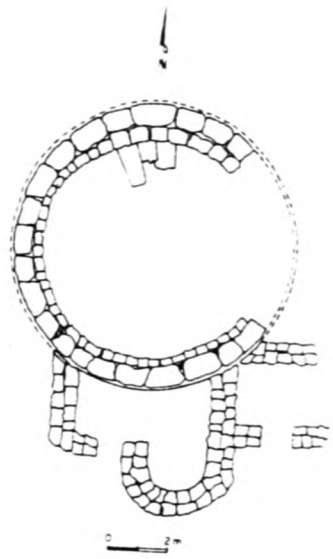


37 (after Preziosi 1994)

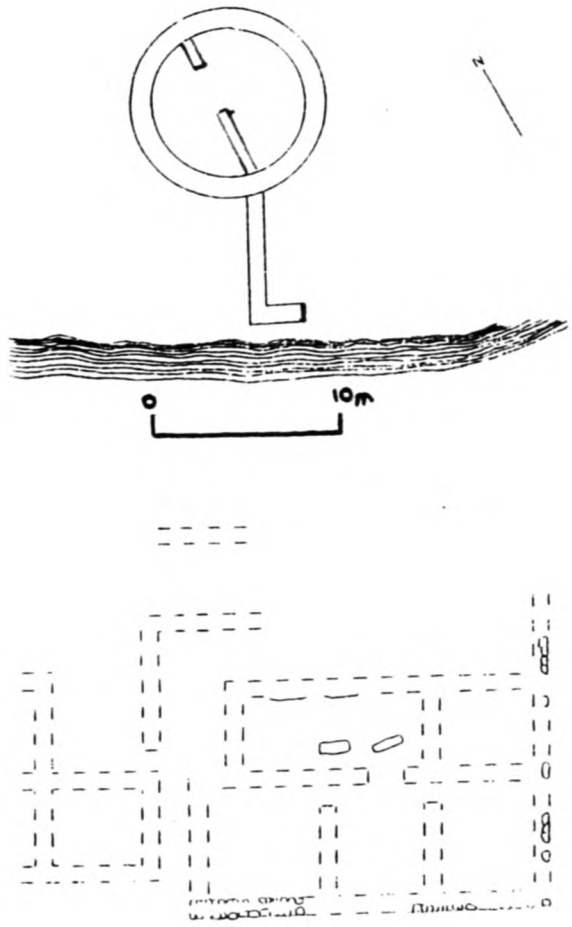
FIG. 6.4 SIPHNOS - *Towers and enclosures (sketches from Ashton 1991; Preziosi 1994 and field observation). See also Appendix 1.4.*



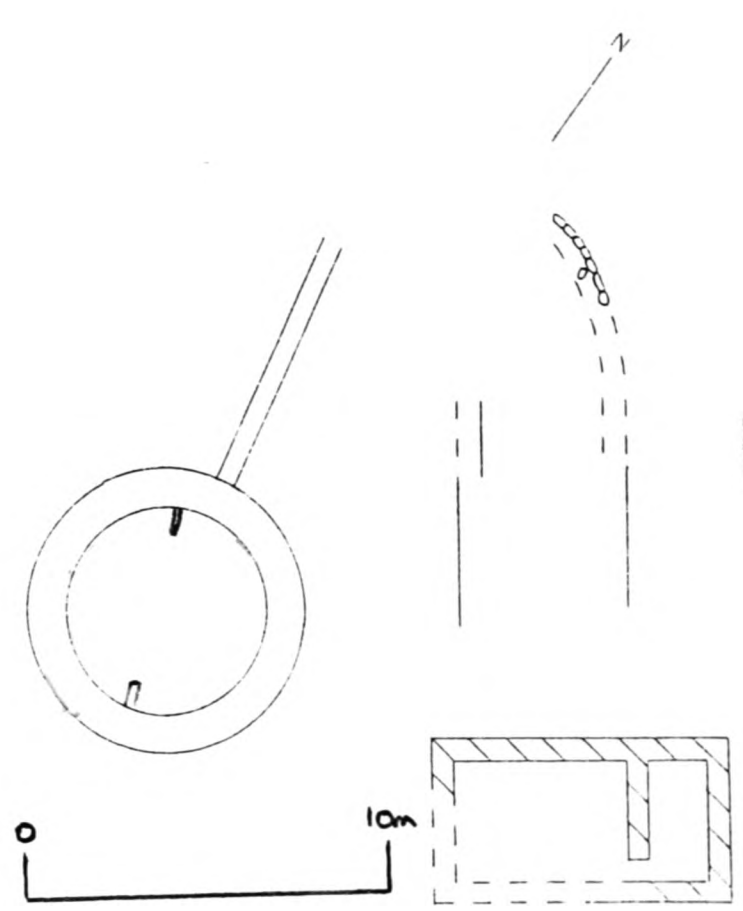
45 (Preziosi 1994)



52 (Ashton 1991)



53 (Preziosi 1994)



54 (Preziosi 1994)

FIG. 6.5 SIPHNOS - *Towers and enclosures (sketches from Ashton 1991; Preziosi 1994 and field observation). See also Appendix 1.4.*

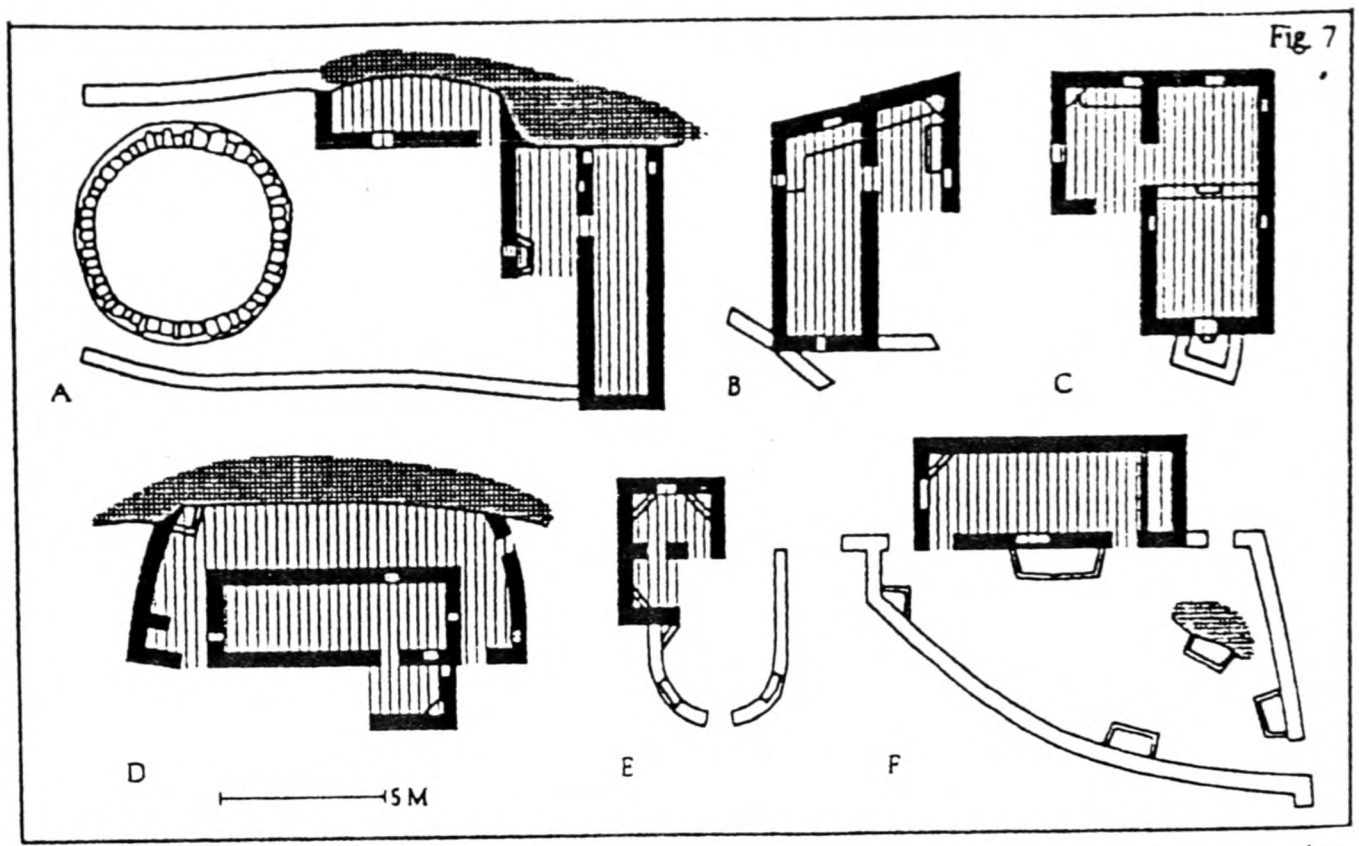


Fig. 7 Recent field structures, northwest Keos. **A**. Storage structure adjacent to threshing floor, re-used as animal shelter. **B**. Storage structure with fireplace. **C**. Enclosed wine press with fireplace. **D-F**. Animal shelters, **D** with fireplace, **D-F**. with feed troughs.

FIG.6.6a: KEOS - *Rural enclosures and field structures on Keos from Whitelaw 1994: 182 Fig. 7.*

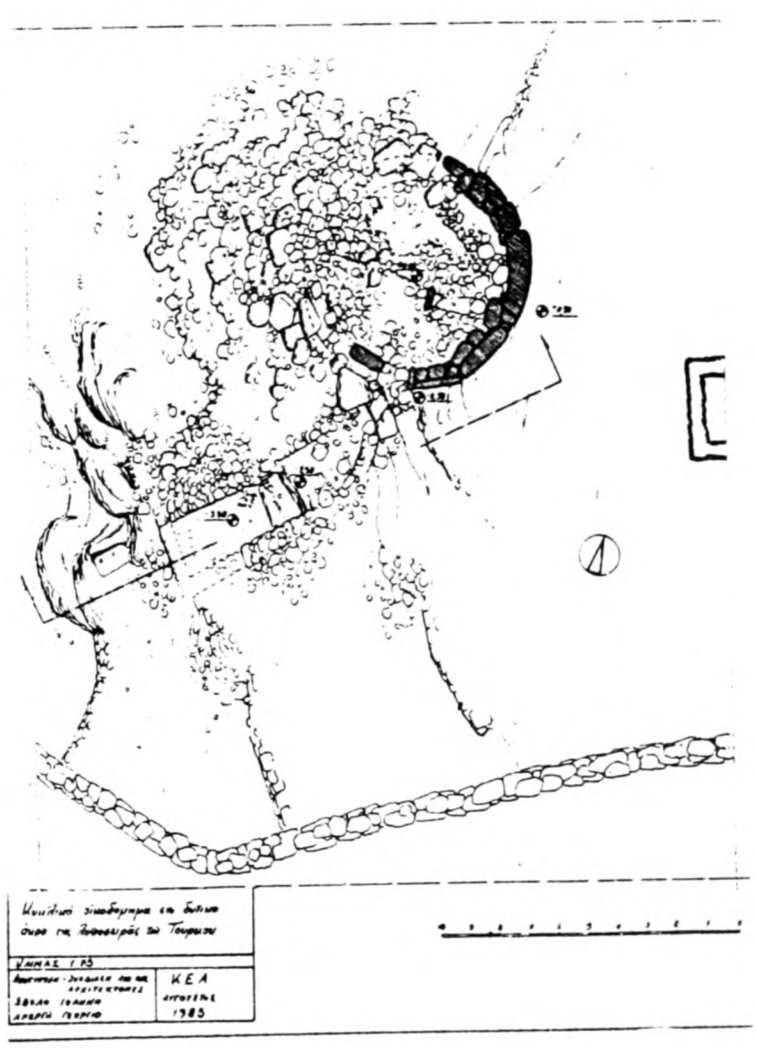


FIG.6.6b: KEOS - *Tourkou tower and curved enclosure after Galani, Mendoni & Papageorgiadou 1987 Plan 5.*

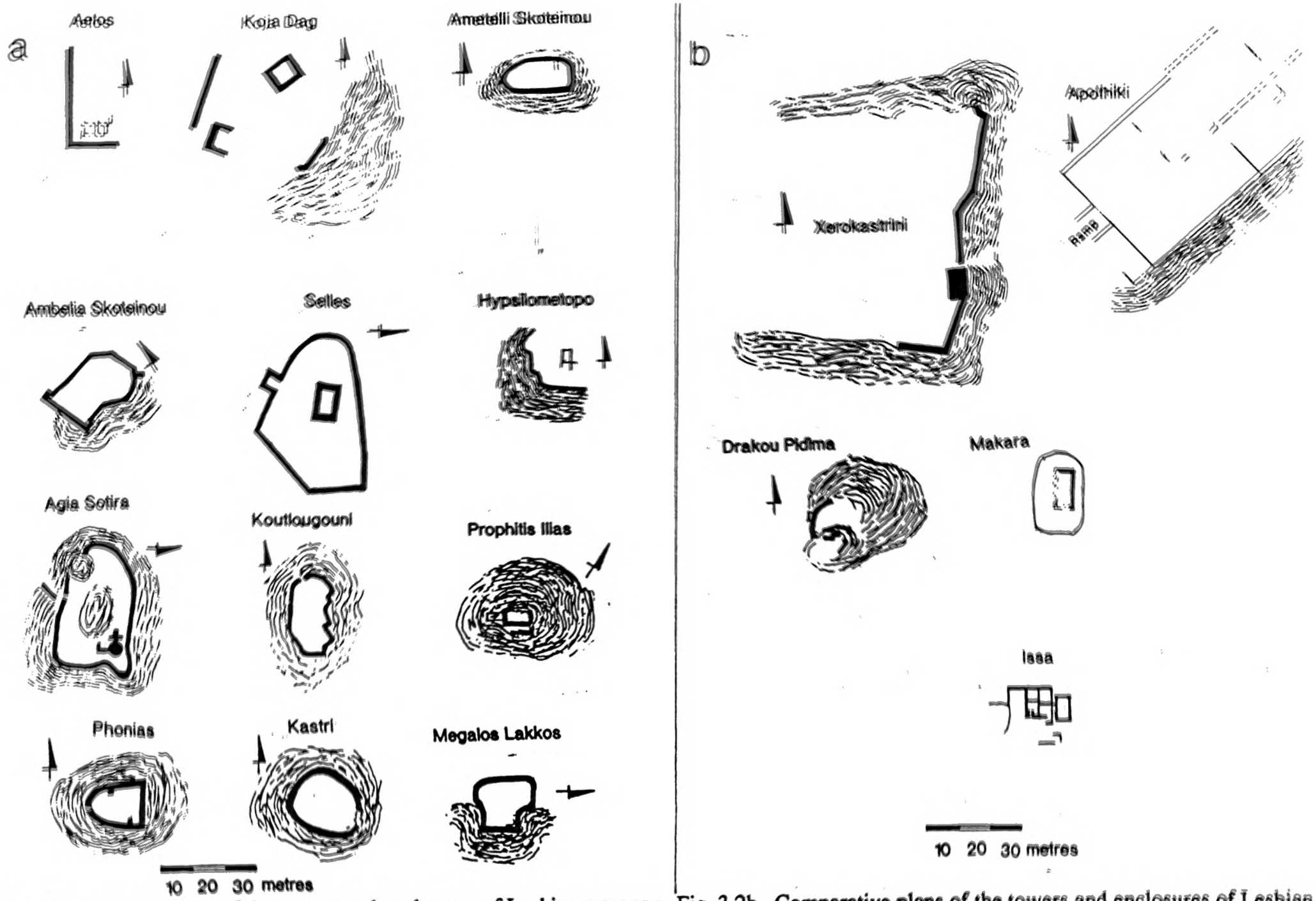


Fig. 3.2a. Comparative plans of the towers and enclosures of Lesbian masonry. Fig. 3.2b. Comparative plans of the towers and enclosures of Lesbian masonry. (Adapted from Koldewey 1890 *passim* , Kontis 1978 *passim* , M. Axiotis "Ενα άγνωστο οχυρό της αρχαίας Μηθύμνας" Archaiologia XXXVIII (1991) pp. 75-7, Anonymous "Αρχαία οχυρά στον Προφήτη Ηλία Σκαλοχωρίου" Ta Nea ton Skalochoriton (Jan-Jun 1989) p. 3, ibid., "Το οχυρό του Φονιά" Ta Nea ton Skalochoriton (Jan-Jun 1989) p. 3.)

FIG. 6.7 LESBOS - *Plans of towers and enclosures with Lesbian masonry after Spencer 1993: 312 Fig. 3.2a.*

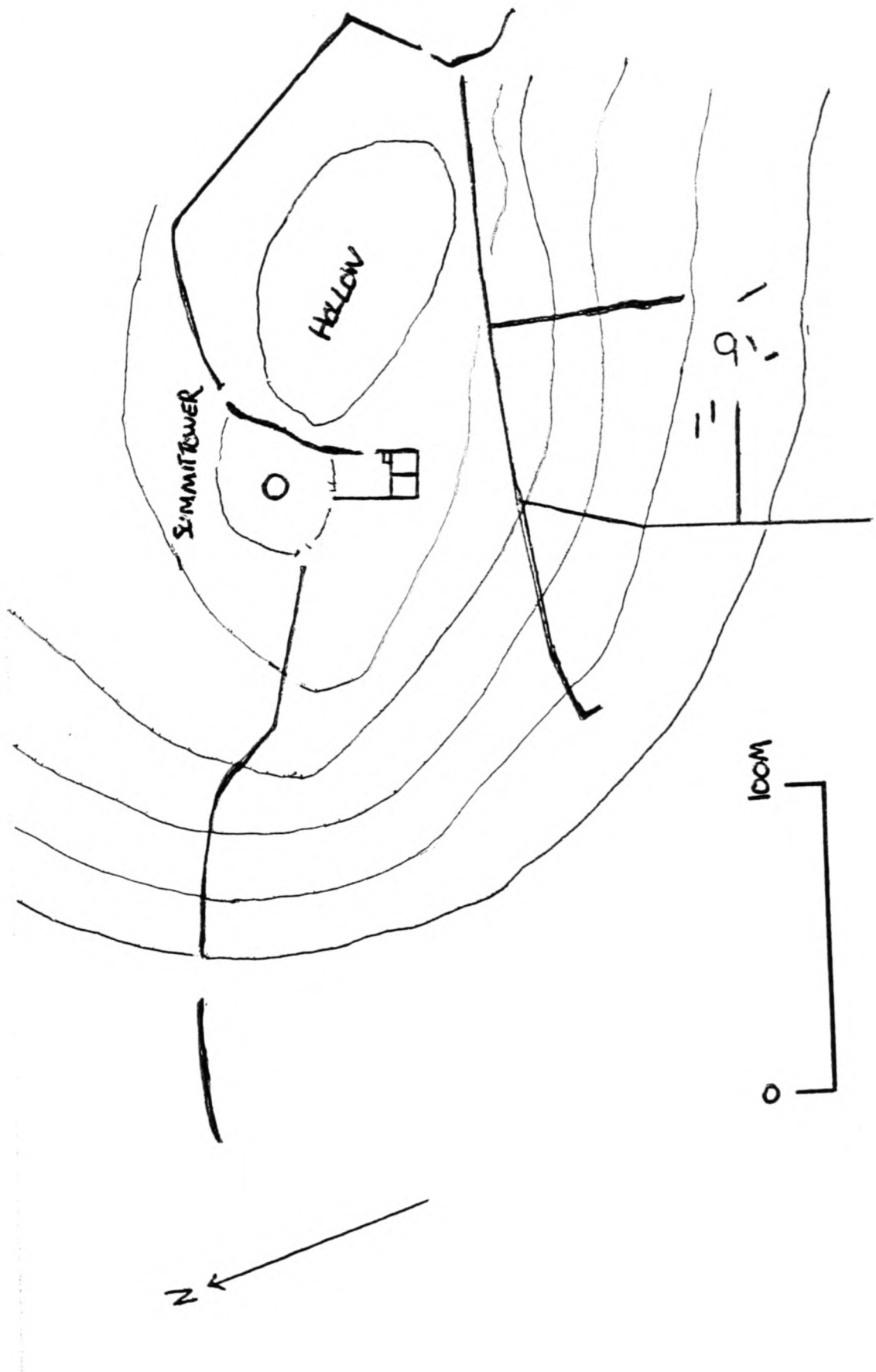


FIG. 6.8: NORTH ATTIKA - *Tower and enclosure Panayia tower, enclosure, buildings, field walls and gates after sketch plan in Munn 1983: 434 Fig.5*

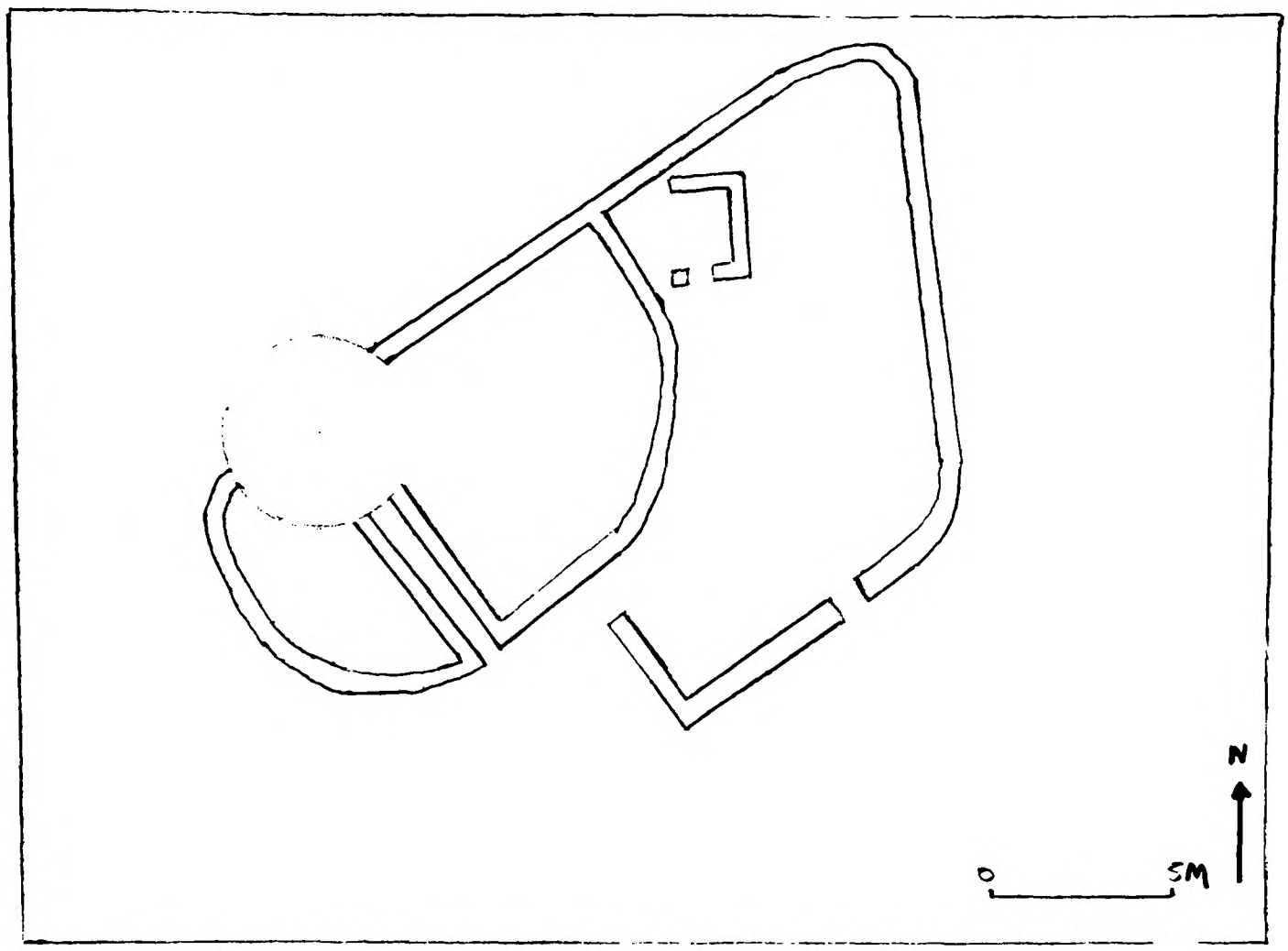


FIG.6.9a: ATTIKA - *Karydhi tower and enclosure after sketch plan in Munn 1983: 439 Fig.6*

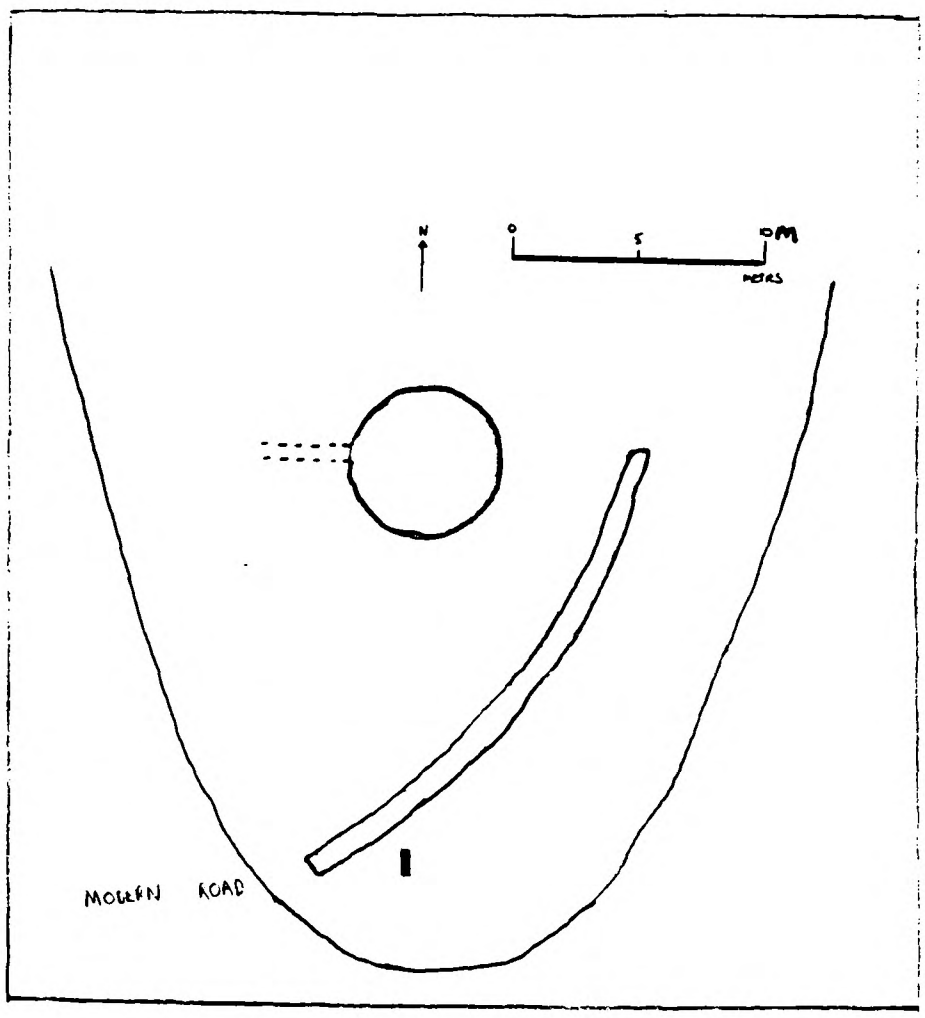


FIG.6.9b: ATTIKA - *Aigaleos tower and enclosure after sketch plan in Munn 1983: 404 Fig.4.*

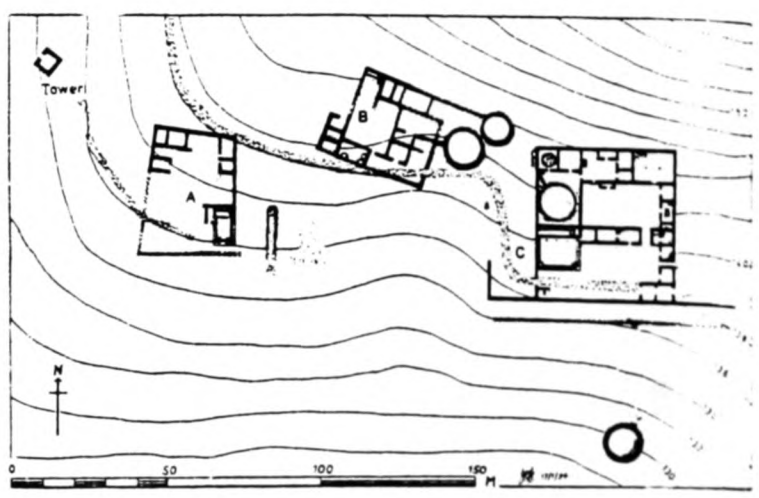


FIG.6.9c: ATTIKA - *Plan of tower and complexes at Golden Pig Tower, Agrileza from Photos-Jones & Jones 1994: 314 fig.1.*

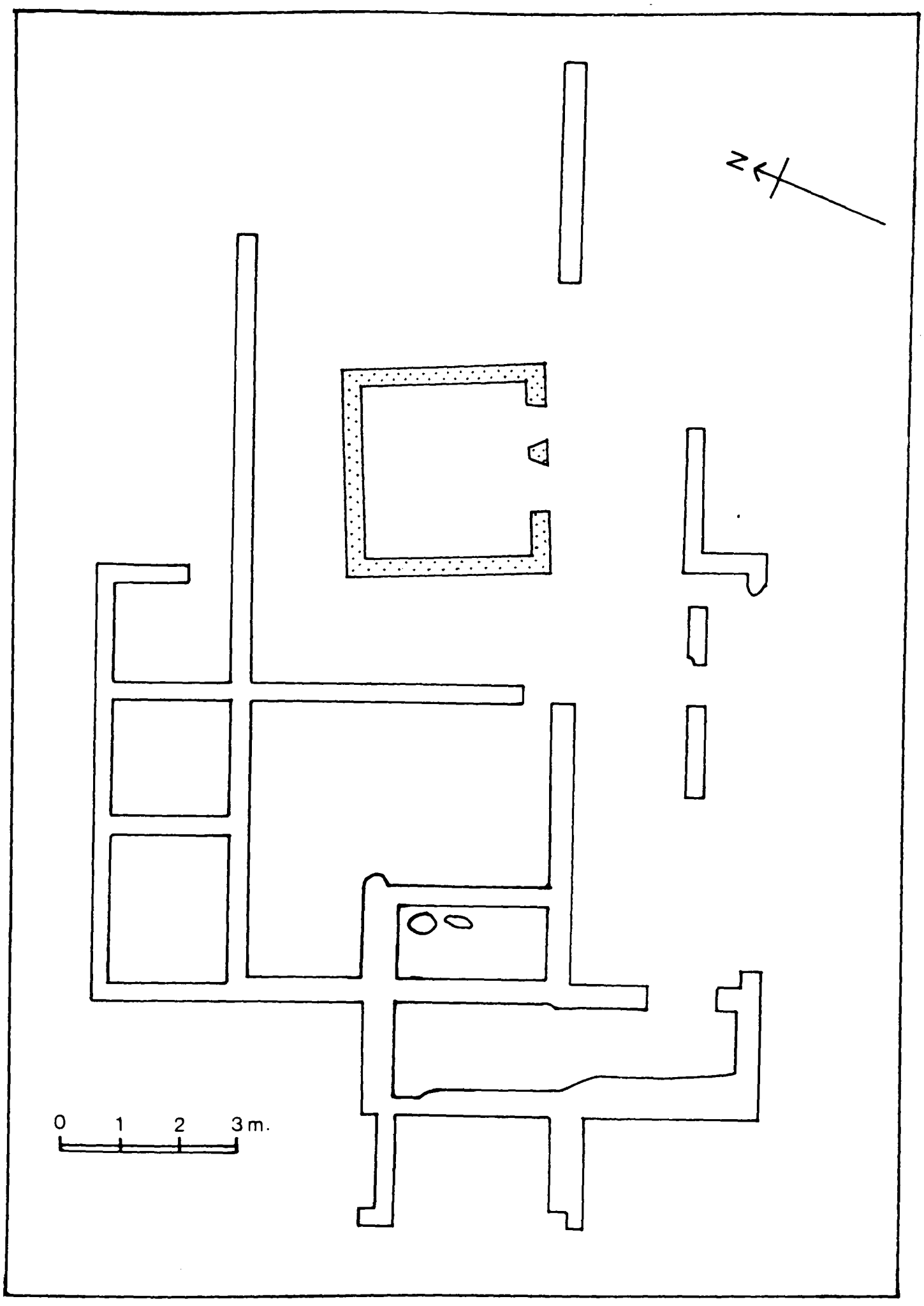
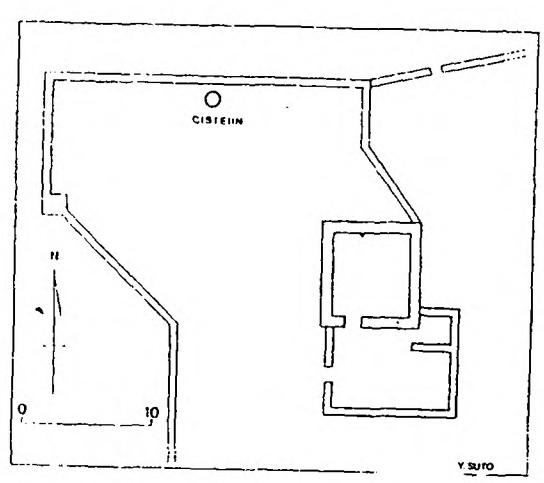
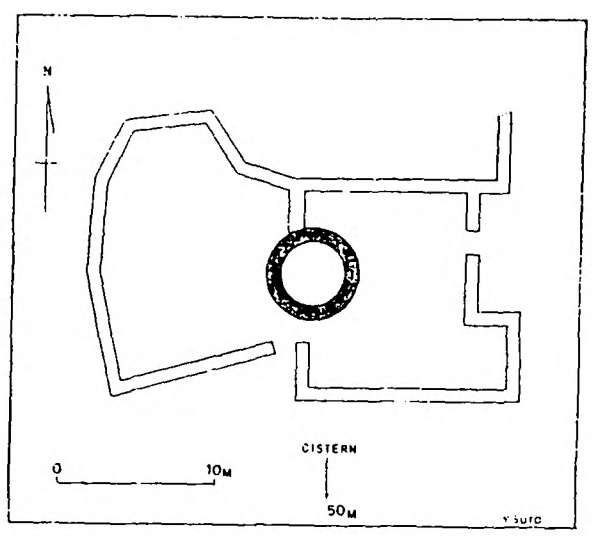


FIG. 3. Plan of Site D (ii) in the N.W. corner of the plain of Mantineia

FIG.6.10: *Tower and building complex in chora of Mantineia (from Hodkinson & Hodkinson 1982:252).*

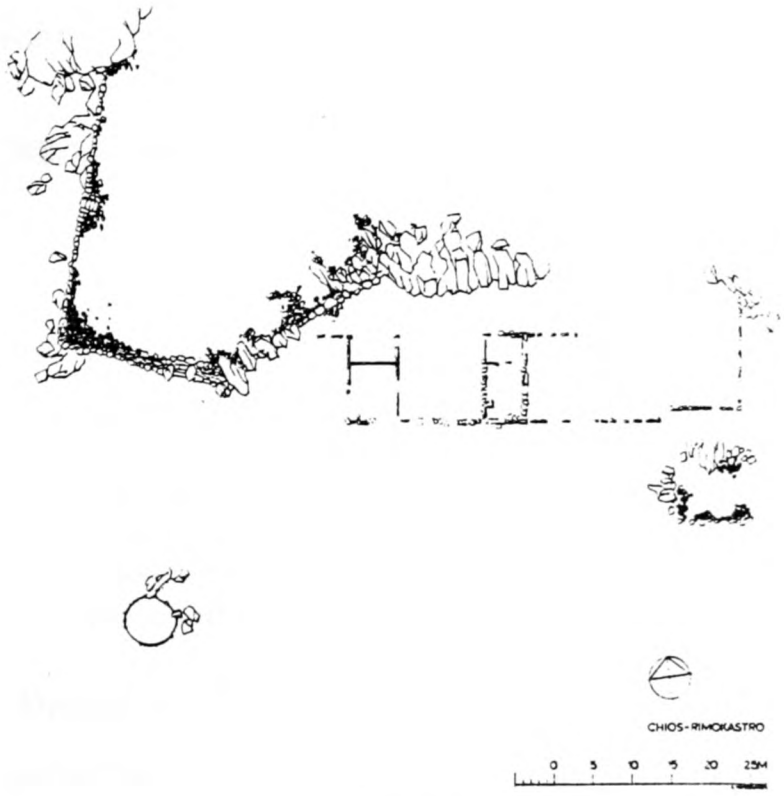


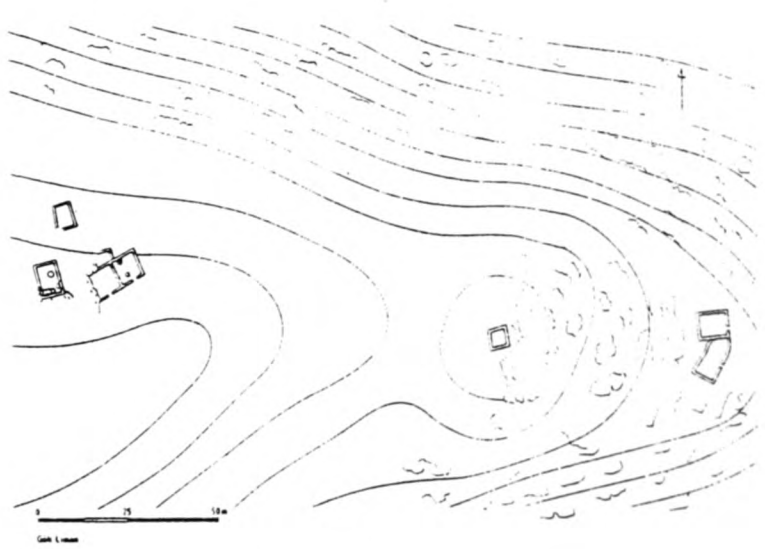


MEGARID TOWERS

FIG.6.11a: *Kyparissi tower and enclosure after Yoshiyuki 1993: 6 Fig.3.*

FIG.6.11b: *Mikros Kryphtis tower complex after Yoshiyuki 1993: 7 Fig.4.*





CHIOS

FIG.6.11c: *Building complex on Mt. Aipos, Chios after Semantoni-Bournia 1987 Plan 1.*

LYKIA

FIG.6.11d: *Tower and enclosure, rural structures at Gök Liman, Lykia after Konecny 1993: 49.*

The curved shape and alignment of preserved walls at **21**, **30**, **52**, **54** appear too small for any regularly planned courtyard arrangement, but are consistent with the shape of pens (*Figs.6.4-6*).[90] In the case of **54**, long rubble field walls criss-cross the scrub hillside overlooking the flat, fertile land around Fikiada bay. Other more fragmentary walls which nonetheless proceed from towers in irregular directions can be detected at **3**, **6**, **9**, **10**, **13**, **19**, **25**, **28**, **37**, **44**.

The locations of **21**, **30**, **52**, **54** are all situated in areas where pockets of agriculturally exploitable land lie below the site, and uncultivable pasture land lies above the site. For example, immediately below **21** lies a pocket of schist soil approximately 12 ha. in size (*Fig.2.3*), where a watercourse runs from the spring source of Panayia Tosou Nerou down into Vlasi bay.[91] However, above the site the slope rises steeply to the rocky ridge of Laouteri. Below and to the south of **30** lie pockets of schist which allow agricultural cultivation of the well-watered slopes around Vlikhada bay, and above lie the upland plateaux of the Profitis Elias ridge (*cf.* **31**, **33**, **35**). Likewise **52** lies above land suitable for cultivation by a watercourse, complemented by the uncultivable slopes and table land of Katsistria and Lagou hills immediately adjacent to the north-east.

Interpreting pastoral structures from often scant archaeological evidence is always problematic. Although the remains of adjoining and adjacent structures around tower sites — especially in the west and south-west of the island — often appear no larger than small pens, the location of such sites in the extremities of the *chora* and in the 'middle' of the vertical landscape, may also be indicative of the role of animal husbandry in the life-cycle of these sites.

HUSBANDRY STRATEGIES

> 'Ancient Greek farmstead sites were being deliberately located close to substantial areas of grazing land. Although it is safe to assume that a regime of mixed agrarian activities was the order of the day, the locational evidence emphasises the importance of animal husbandry in the economic mix. It also indicates that animal husbandry was normally closely integrated with arable agriculture and arboriculture. Nevertheless, it is evident that the uncultivated landscape was a crucial economic resource. It is also highly likely that, at various points during the histories of many of these estates, the farmsteads constituted only a seasonal base for their livestock, which would have been located elsewhere at other parts of the year.'
> Forbes 1994: 196

The *chora* of Siphnos was simply too small to fit any 'transhumance' model of husbandry in the sense of long distance relocation according to summer and winter pasture. However, within a relatively small territory (common to many *poleis*), pastoral 'mobility strategies' may occur within supposedly 'sedentary' populations, especially when husbandry is integrated into the agricultural

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[90] For the ethnoarchaeology of pastoral sites, see Chang 1984; Whitelaw 1994: 182 fig.7e.

[91] Around the watercourse today grow reeds, wild plants and trees.

cycle: thus pockets of uncultivable land (such as uplands or uninhabited islets) might be used for seasonal pasture to avoid crop damage at certain times of the year.[92]

In this regard, the upland location of tower enclosures on Lesbos has stimulated re-consideration of their use within pastoral husbandry strategies, based around the seasonal movements of flocks, yet integrated into agricultural manuring cycles which may permit more intensive agricultural practice, either by direct manuring (grazing animals on crop land after harvest) or by the application of rotted manure collected from penned animals fed with fodder (*Fig.6.7*).[93] Such a scenario would certainly be consistent with the types of tower site use discussed previously, where such structures formed only one dimension of an *oikos*, and were not necessarily its residential centre.

In the case of Siphnos, one possible interpretation might involve the seasonal pasturing of flocks in the western uplands of Profitis Elias (and Ayios Simeon in the north) while crops were cultivated in the south-east (and Troulaki valley in the north). Alternatively, a 'vertical' symbiotic husbandry arrangement on the west coast, between agricultural niches on the lower slopes, and pasture areas on the upper slopes (with pens situated at mid-slope sites) would assist the arable cultivation of the steep sloped land in this area, and cut down on the transport of manure.[94] Hypothetical quantification of the island's sheep/goat capacity according to the amount of upland slope area suggests that such rural sites were well capable of supporting 'agro-pastoral' flock sizes (less than 100 head) which for manuring purposes would be especially suitable for cultivation of the small pockets of schist in the west of the island.[95]

This model diverges from the 'minimalist line' advocated in a recent study of manuring in ancient Greek agricultural landscapes,[96] which argued that estimates of household manure

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[92] See Chang 1992: 69 for the term 'mobility strategies'. For movement of grazing animals within practices of intensive land use, see Alcock, Cherry, Davis 1994: 152; Forbes 1994: 188, 'Animals can sometimes be moved over significant distances within the region in different seasons, and fold sites can be located at a considerable distance from households' home bases.' For the use of seasonal (but not transhumant) pasture incorporating 'mobility strategies', see Girard 1879: 190 (Alonnisos and Skopelos); Robert 1949: 165 for islets off the coast of Amorgos; Jameson, Runnels, van Andel 1994: 290-291, 299-300 for Argolid (*cf.* Strabo X.488; XIV.639 on the use of Ikaria by the Samians).

[93] Halstead 1990: 152 for the feeding of surplus grain staples to animals. Halstead (in Wells 1992: 131) also suggests another alternative may have been to let goats onto marginal upper slopes of hillsides which had been cultivated only in years where there was a poor crop which was not worth harvesting.

[94] In this respect, the presence of wells and cisterns at many rural sites on the west coast (even when located near a natural water source) might be suggestive of heavy water demand from agro-pastoral activity. Semple 1932: 407 on the labour intensive application of manure. For the 'verticality' of pastoralism, see Ch.1 n.213.

[95] 4,000 sheep and 2,800 goats were recorded on the island in the early 1970's (Vielweib 1983: 139). However, given that cereal cultivation may have declined (and grazing land increased), these figures can be qualified. Based on 0.2 ha. pasture/animal (Barker & Grant 1991: 30), the uncultivable upland areas (above 400masl) of Profitis Elias and Ayios Simeon (approximately 5km^2) alone could support over 2,000 animals, without any consideration of direct animal pasturing on lower, cultivable slopes, or the use of the offshore islet of Kitriani as seasonal pasture (Bent 1965: 37).

[96] Alcock, Cherry, Davis 1994: 152, 157, 'We may have moved from under-estimating to over-estimating the use of *kopros*...Intensive sheep- and goat-raising, with manure deposited near the farmstead, may have been very

production and application showed, 'the restricted scale of the manuring that was feasible for households of this size', depending on variables of animal numbers and application of manure (e.g. direct or rotted manure, heavy or light application).[97] In each of the three household models which produced the minimalist figures of manure production, the maximum number of sheep and goats ranged from only 8-12.

However, allowing for the more flexible strategies of animal husbandry suggested by Forbes which might permit larger flock sizes (*Table 6.5*), 50-100 part-time grazing sheep/goats might produce a minimum 30-60 tonnes of manure alone, which (depending on use of rotted or fresh manure respectively) might serve approximately 1-4 ha. (light dressing), 0.5-2.5 ha. (heavy dressing).[98] This would be especially significant for garden cultivation, viticulture and arboriculture in the afore-mentioned lower slope schist niches prevalent on the west coast and north of the island.

What is undoubted is the environmental suitability of mountainous Cycladic islands for animal husbandry, and its importance in regional economies at certain times.[99] Thus, it is not surprising that several allusions to animal husbandry in ancient literature specifically relate to the Cyclades, and emphasise the outstanding qualities of products there. *Kytisos*, a fodder crop which supposedly spread from Kythnos throughout the Cyclades (at least according to later aetiologies) was revered by later writers as something of a 'wonder plant' and panacea.[100] Cheap and easy to grow, it was supposed to increase the supply and quality of animal milk (and thus cheese), save on other fodder and act as medicine.[101] Although no doubt something of a *mirabile* by Pliny's time, the association of Kythnos and the Cyclades with specialised fodder and quality dairy products might be set alongside the pastoral produce of Keos reported by Aelian.[102]

Kytisos was also supposed to stimulate apiary activity - a subject which has tended to be passed over in discussions of uncultivable land use but which has increasingly been revealed by excavation and survey at rural sites, including towers - noteworthy since the Cyclades were held in repute for

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common; but it would have been on a small scale...In the traditional model of Greek agriculture, manuring was down-played, but the danger now lies in the opposite direction. We take a more minimalist line here.' It is arguable that this study, which collects together references to manuring in ancient literary and epigraphic sources, and emphasises the low, or non-existent number of animals on estates of the Athenian Hermokopidai, implicitly adopts an Attic model of husbandry (see Hodkinson 1992).

[97] Alcock, Cherry, Davis 1994: 153-154, estimating a manure quantity of 1,200 kg/animal/year for penned animals, 600 kg/animal/year for grazed animals, and including estimates of waste from humans, oxen, pigs, chickens as well as sheep and goats.

[98] Alcock, Cherry, Davis 1994 Table 8.1.

[99] Thoukydides II.14.1. Liati 1987: 27, 164-167 for the importance of exported animal produce in the economy of Seriphos during Ottoman rule, and the nickname 'μικρή θεσσαλία' which it acquired. The balance of payments from animal products (meats, cheeses) was necessary to provide staples for a population of around 3,000.

[100] Sallares 1991: 384-6 on Pliny *NH* XIII.47.134.

[101] Pliny *NH* XIII.47.130.

[102] See above p.38.

the quality of honey produced in antiquity.[103] Honey and wax could were useful commodities which could be produced with combed ceramic jars acting as hives.[104] This type of hive could be moved to take advantage of different vegetation over the course of the year.[105]

Hive fragments have been identified at several tower sites in Attika and the Cyclades; at the Dema tower beekeeping appears to have been a primary means of land exploitation.[106] As such, a tower was eminently suitable for the secure storage of this type of moveable property, specialised equipment and valued agricultural product.[107] Ancient combed sherds have been identified at **45**, and possibly at **18**.[108] Combed wares in general were observed by Young at Siphnian tower sites. Since much hive pottery was left plain, and because identification is never straightforward, it is only recently that beehive fragments have been correctly identified.[109] However, it is worth noting that apiary was of considerable importance in more recent times on Siphnos, and the remains of bee walls on the western slopes of the island are still visible.[110]

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[103] Pliny *NH* XIII.47.131. Dioskourides II.52 notes the quality of Cycladic honey (*cf.* Pliny *NH* XI.19 who also records lost treatises, '*Melissourgika*', on beekeeping by Philiskos of Thasos and Aristomakhos of Soli). Apiary is largely passed over in discussion of land use by Isager & Skydsgaard 1992: 96. See discussion in Osborne 1987: 78; Burford 1993: 144-145; Forbes 1996: 92-3.

[104] For coarse pottery, horizontal hives, Jones 1976; 1990; Crane 1983: 41; Crane & Graham 1985 (*cf. Od.* 12.105-106). According to Aristotle *Historia animalium* 627b a hive might produce 5-7 kg of honey, a good one 10-12 kg, and an exceptional hive 14 kg at each harvest. At a figure of 3 obols per kotyle for sacrificial purposes at least, cited in the early fourth-century (*IG* II^2.1356), the commodity of honey was worth 2dr./kg (Pritchett 1956: 259).

[105] Crane & Graham 1985: 11; Forbes 1996: 93. Plutarch *Solon* 23 (where beehives had to be separated at least three hundred feet from each other, presumably in all directions) makes sense as a practical response to the mobility (vertical and horizontal) of these agrarian installations. Pliny *NH* 21.73 for a later example of the mobility of beehives.

[106] Crane & Graham 1985: 20. See Jones 1975: 119 for combed ware at the Princess tower (southern Attika). Also Munn 1993: 77 fig.31; 85 n.18 for beehive ceramics at the Dema tower. Sutton 1991: 260-3 for Keian material.

[107] Note beehives among the confiscated property in *IG* I^3.426.56 sold for a total of 260 (?) dr. (*cf.* Pritchett 1956: 260-1; Crane and Graham 1985: 12).

[108] **45** - Ashton 1991: 126-7. **18** - personal observation of *pithoi* with combed interior.

[109] Comments of Young on beehive pottery at Siphnian towers in Jones 1975: 137. Problems of identifying beehive fragments from excavation and survey, see Sutton 1991: 260-262.

[110] Crane 1983: 72-75 on bee walls. Fiedler 1841: 128; Blitzer (forthcoming) for the importance of apiary in integrated land use systems in the north of the island during the twentieth-century AD.

	No. animals	No. animals
	50	**100**
Manure produced @600kg/animal	30,000	60,000
m^3 fresh manure @400kg/m^3	75	150
ha. manured @ 40 m^3 fresh manure/ha.	1.9	3.8
ha. manured @ 60 m^3 fresh manure/ha.	1.3	2.5
m^3 rotted manure @875kg/m^3	34	69
ha. manured @ 40 m^3 rotted manure/ha.	0.9	1.7
ha. manured @ 60 m^3 rotted manure/ha.	0.6	1.1

TABLE 6.5: *Hypothetical quantification of manure production and application from part-time grazing animals in a flock size of 50-100 animals, according to estimates in Alcock, Cherry, Davis 1994 Table 8.1.*

moveable property → supervision and storage

specialised, component-assembly equipment → seasonal storage, re-assembly

'cash-crop' produce → intensive labour, multiple-stage processing and storage, security

TABLE 6.6: *Factors encouraging secure storage at rural sites.*

CONCLUSION: THE ARCHAEOLOGY OF *ESCHATIAI*

> 'Ainsi, ce qui caractérise le système agricole des Grecs, c'est la mobilité perpétuelle des cultures, ou plutôt un effort continu pour tirer du sol des produits de plus en plus avantageux.'
> Guiraud 1893: 514

ECONOMIC GEOGRAPHY OF RURAL PRODUCTION

A 'snapshot' of the economic geography of Siphnos in the Later Classical/Hellenistic period might superficially fit the von Thünen model of the 'isolated state': arable cultivation (including cereals and vegetables) concentrated around the urban centre in the south-east, with animal husbandry occupying the 'outer ring' of more marginal land.[111]

However, this would be to ignore both the 'horizontal' distribution of cultivable micro-regions throughout the countryside, and the 'vertical' dimension of lower slope cultivable land and upper slope uncultivable land.[112] In this respect, Apollo Enagros and Pan were suitable deities for the *polis*.[113] The outlying western and northern areas of the *polis* (as much as south-eastern areas) appear to have been in intensive use during the Later Classical-Hellenistic period (and indeed earlier in the case of mine areas): the monumental masonry of rural sites might be matched by investment in soil management systems, arboriculture, and animal husbandry.[114]

Thus we cannot simply assume that areas of marginal land were necessarily exploited by poorer landowners in society.[115] The general pattern of known tower sites indicates that the marginal and uncultivated landscape could only be exploited by land use strategies with relatively little emphasis on small scale cereal cultivation for household consumption, but rather on 'cash crop' commodities.[116]

Viticulture and arboriculture provided such commodity produce (wine and olive oil), while animal husbandry could not only serve market demand for secondary products (such as wool,

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[111] Gamble 1982: 164 for animal husbandry in the von Thünen model.

[112] e.g. Theophrastos *HP* II.5.7 for the planting of fruit trees on lower slopes.

[113] Borgeaud 1988: 60, 'To Pan belongs all that the Greeks call the *eschatiai*, the "edges".'

[114] Robert 1960: 305 n.1; Yoshiyuki 1993: 13; Jameson 1994a: 56-60 for the connection between well-built rural sites and *eschatiai* (*cf.* Hanson 1995: 81-82).

[115] Jameson 1992: 141.

[116] *cf.* the later cultivation of tobacco and cotton (introduced in the Ottoman period), citrus fruits, and fowl reared by the wealthy elite in impressive multi-storey dove lofts in the south-east of the island (Gkion 1876: 164; Philippson 1901: 59; Slot 1982: 18; Tzakou 1984: 31). Bintliff 1994b: 239 argues that intensification of cultivation in fourth century BC Attika (evidenced by the number of agricultural buildings) may indicate a need for self-reliance in agricultural production. However, the location of rural sites surely indicates the cultivation of commodity products (without revenue from the Athenian Empire), rather than subsistence farming.

cheeses and honey) in urban areas,[117] but could also supply cult demands for animal sacrifice (most notably Delos in the case of Cycladic islands).[118]

RURAL STORAGE IN THE *OIKOS* AND *POLIS*

The factor of *storage* is common to the types of land use explored above, whether through arable, pastoral or extractive activities (*Table 6.6*). Specialised, 'component' equipment for agricultural or extractive processing needed to be stored securely, especially where the absence of such items might render processing activities impossible, with important consequences at certain key periods of 'time stress'.[119] However, in addition to the use value of seasonal equipment,[120] the cash value of the harvest and *in situ* processed goods was a further incentive for monumental construction at the level of the *oikos*, where storage was the mark of 'true wealth'.[121]

Such rationality in rural investment at the level of the household contrasts both with the specific view of rural insecurity and poverty in the Late Classical and Hellenistic countryside, and the general theory of the parasitical 'consumer' city. It is worth noting that security and stability was often a pre-requisite for prosperous rural sites, and as such, significant rural investment was hardly the material response to banditry or piracy.[122]

An alternative explanation may be sought through reference to rural *productivity* (rather than overall production), as has been made with regard to a study of Seriphos during Ottoman rule,

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[117] Hodkinson 1992 (also Rackham & Moody 1996: 160 for the commodity value of cheese). Reger 1994a: 62-63 on the cult requirements of Delian Apollo, 'The temple consumed Kykladic products...The cheese, wax and *miltos* that appear in the accounts almost certainly came from close neighbours like Syros, Kythnos, Keos and Rheneia.' For (incomplete) lists of cheese (τυρός) - *ID* 440A.69; honey (μέλι) - *ID* 445.14; wax (κηρός) - *IG* XI 2.154A.36, 161A.111, 287A.54, 62, *ID* 316.84, see Reger 1994a: 63 n.55.

[118] Mantzoulinou-Richards 1986; Jameson 1988: 104 for bought sacrificial animals (*contra* Isager 1990);

[119] On the storage of farm implements (γεωργικὰ σκεύη, κατασκευη) as an important part of movable property, see Hanson 1983: 89; 1995: 63 (*cf.* Étienne 1990: 27 on agricultural meanings of σκεύη in *IG* XII 5, 872).

[120] Amouretti 1993: 5-6.

[121] Aristotle *Politics* 1256b 13-14. *cf.* Forbes & Foxhall 1995: 84, 'We argue then, that food supply — founded in storage decisions and strategies — was a household, not a community matter...This is not simply to retreat to another substantivist position, which explains such economic behaviour entirely in terms of 'economically irrational' social relations, characteristic of societies other than our own. Rather, we would argue that the household, in a large number of both modern and ancient societies, constitutes an arena of economic decision-making which is out of reach of the state in most cases.' See also Bourdieu 1977: 184-185 on the relationship between wealth and economic power.

[122] *viz.* McGrew 1985: 220 on the rural economy of nineteenth-century Greece, 'Yet another powerful factor which kept cultivation in a wretched state and drove large proprietors from the land was widespread brigandage that plagued rural districts until the waning years of the [nineteenth] century. Any farmhouse which was more than a hovel and any proprietor who showed signs of prosperity became a target for attack or kidnapping. Consequently, otherwise desirable sites were left undeveloped as landowners, unable to manage their properties directly for want of security, gave them up in favor of residence and employment in towns.'

> 'It will be argued that it is the way in which the agricultural production systems of the Cyclades have been organized (i.e. who has controlled the land and has been in a position to make decisions concerning the allocation of resources)—*not* the overall level of production on an island—that has principally influenced the location of settlement for most agricultural producers, and, consequently, has determined the degree of visibility or invisibility of the archaeological record...the visibility or invisibility of archaeological remains in the hinterland of a population center such as the *asty* (i.e. the central settlement) of a Classical *polis* or the Medieval Chora of an island cannot be assumed to reflect directly the level of absolute *production* generated by the local economy. The principal factor determining numbers of rural sites in a given period is rather the *productivity* of subsistence agriculture, a variable that has not, in the past, necessarily been positively correlated with total production.'
> Davis 1991: 191, 196

Davis suggested that specialisation in a cash crop (such as viticulture) may have encouraged more rural investment (and rural residence).[123] However, although intensification might lead to greater productivity, this did not necessarily mean that a greater amount of land was held under cultivation; indeed the area of land might be reduced in order to garner the benefits of intensive agricultural methods.[124] It is possible to see the archaeological remains of Siphnian towers as an epiphenomenon of this kind of rural organisation: an intensification of agriculture (e.g. employing agro-pastoral husbandry) indicating high productivity from certain *locales*.

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[123] Davis 1991: 192. *cf.* Renfrew 1982 who argues for the positive-feedback relationship between external stimuli and internal, local production.

[124] Davis 1991: 139-140.

CHAPTER 7

CONCLUSION: RURAL SITES AND THE *POLIS*

ὦ μῶρε, μῶρε, ταῦτα πάντ' ἐν τῇδ' ἐνι·
οἰκεῖν μὲν ἐν ἀγρῷ τοῦτον ἐπὶ τῷ γῃδίῳ
ἀπαλλαγέντα τῶν κατ' ἀγορὰν πραγμάτων,
κεκτημένον ζευγάριον οἰκεῖον βοοῖν,
ἔπειτ' ἀκούειν προβατίων βληχωμένων
τρυγός τε φωνὴν εἰς λεκάνην ἡθουμένης,
ὄψῳ δὲ χρῆσθαι σπινιδίοις τε καὶ κίχλαις
Aristophanes *Islands* = *PCG* fr. 402

'You idiot, idiot, it's all like this -
This man lives in the field on a bit of land,
Rid of the business of the *agora*,
Owning his own yoke of oxen,
Then hearing the bleating of sheep,
And the sound of the new wine trickling into the vat,
For dinner he'd have chaffinches and thrushes...

It is hoped that the preceding chapters have not only demonstrated the importance of the economic geography of the ancient Greek countryside to our understanding of the ancient world, and its continuing engagement with the present (through the preservation of archaeological traces of previous human activities), but has also contributed to ongoing academic debate about the types of questions asked of the ancient evidence, the assumptions behind the questions, and the methods used to answer them.

This concluding chapter attempts to draw together salient points from the discussion of research in Part I and the results of the case study in Part II, acknowledging the limits of the evidence, and suggesting a number of directions in which future work may positively contribute.

RESULTS OF THE STUDY AND LIMITS OF THE EVIDENCE

POLITICAL DIMENSIONS OF THE ANCIENT COUNTRYSIDE

Despite the emphasis by Guiraud and some later scholars on the political dimension of agrarian organisation, the majority of modern research (not unique to Marxist scholarship) has tended to emphasise 'economic' explanations in approaches to the study of settlement and land use in the ancient countryside.[1] This propensity to interpret available archaeological evidence without due reference to political structures is partially understandable in the case of many *poleis* beyond Athens, where political institutions, political practice and political geography are less well known. However, as the quote above (from a fragment of Aristophanes' lost comedy *Islands*), or the tradition which grew up around Timon (Lucian *Timon* 42) indicate as literary commonplaces,[2] an

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[1] Guiraud 1893: 595. See now Hodkinson 1990: 141, 157 on political factors in the explanation of agrarian organisation. Gerschenkron 1968: 45-47; Figueira 1994 for critiques of 'economic determinism' in historical causation (also Morris 1994b: 45 regarding the archaeological record).

[2] *cf.* Alkaios *Fr.* 130.24 (φεύγων ἐσχατίαισ') for exile.

individual's relation to the rural landscape might be represented as political *apragmosyne* or even misanthropy, where ownership of oxen, flocks, vineyards all occurs in an *agora*-free environment, and even the eating of wildfowl offers an added touch of rustic culinary taste.[3]

Ideal analysis of the ancient countryside — where archaeological, epigraphic and literary evidence survived — would undoubtedly integrate these and other factors (e.g. cultic dimensions of *polis* geography) to assess their *relative* influence. However, due to the partiality of available evidence for individual *poleis* (as in the case of Siphnos' archaeological material), it has to be admitted that environmental and economic factors may have been privileged in the absence of a narrative 'political' history, and at the expense of 'political' factors not readily recoverable in the archaeological record.[4] However, a contrary danger, given the bias towards 'economic' rather than 'political' factors, might be to adopt an explanation which acknowledges political factors (such as the relation between town and country), yet implicitly invokes an 'Athenian template' that skews our interpretation of other *poleis*.[5]

HABITATION OF THE ANCIENT COUNTRYSIDE

Guiraud's influence on scholarship has also tended to forge debate about habitation of the ancient countryside around an 'Athenian template' which tends to phrase the archaeological investigation of the countryside in terms of 'isolated' farmsteads or nucleated (village) dwellings, 'permanent' or 'seasonal' rural structures in a large territory. Archaeological material is the primary source of evidence for human activities in the ancient countryside outside Attika. However, as the evidence from Siphnos and elsewhere illustrates, architectural or archaeological find-material from excavation or survey rarely 'proves' permanent habitation.[6] It is better to talk in more general terms of 'rural investment' than to assume automatically that rural sites form the residential centre of an *oikos*.

The case study has attempted to illuminate this aspect of rural investment by suggesting that rural site clusters, through their similar architecture, proximity and locally intervisible placement may relate to competitive monumental construction.[7] This offers a more convincing explanation than a model of unilinear 'architectural development', where smaller diameter towers with poorer masonry might be interpreted as earlier, primitive efforts before technological progress improved

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[3] Carter 1986: 99-130; Steiner 1994: 193; Hanson 1995: 59.

[4] For example, we do not know the relationship of Siphnian rural sites to factors of inheritance, land fragmentation or consolidation (*cf.* Jameson in Wells 1992: 172 on these issues).

[5] Brunet 1992: 37 on the respective problems of environmental and political determinism in the explanation of human activities in the countryside

[6] Munn 1983: 73 n.80.

[7] See Spencer 1995b: 37 n.3.

their construction. Although archaeological evidence cannot provide a direct insight into rights of ownership,[8] emulation at a local level suggests the presence of several neighbouring landowners (but as noted above, this rural investment does not necessarily mean permanent habitation).

This does not necessarily mean that rural sites were not residences, but rather prompts the question of their relative importance in the economic geography of the ancient countryside, especially in *poleis* comprising small territories where any two points in the *chora*, and a variety of settlement orders, might exist within a few hours walking distance of each other and the *asty* (*Fig. 7.1*).[9] The pattern of Siphnian monumental construction certainly indicates that it would be inappropriate to define such buildings as 'isolated' farmsteads: although sites tend to be situated more than 2 km from the *asty* (a distribution pattern consistent with several other polities on Amorgos, Keos and Lesbos),[10] their relative density and proximity to other sites requires alternative means of describing and explaining the inter-relation of rural infrastructure.[11]

In considering the range of monumental site sizes (including associated complexes) in relation to an overall settlement pattern, it is worth noting that the virtual absence from ancient literary sources of the term κώμη (village) in reference to the Cyclades does not mean that such settlement types were unknown.[12] Again, the real time walking distance between possibly contemporary 'middling' settlements — arguably hamlets or villages such as Vlasi, or Mavro Khorio (*Fig. 7.1*) — and tower sites indicates their relative proximity in a rural patchwork.

There are limits to any attempted quantification of a 'residential' rural population, just as estimates of residential urban populations are also dependent upon a number of variables (including the size of enclosed area and population density).[13] A hypothetical estimate (depending on the life-

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[8] Isager & Skysgaard 1992: 79-80.

[9] Jameson 1994: 57 on the proximity of a nucleated centre within 1.5-2 hours of rural buildings meaning that such buildings 'may only be secondary or temporary residences of a stable population in a nearby town.' *cf.* the assessment of Mendoni 1994: 156 that the distance from *asty* to the furthest territorial point of each Keian *polis* was small, 'the daily back and forth between city and field presented no problem.'

[10] See Boussac & Rougemont 1983: 117 for Amorgos; Cherry, Davis, Mantzourani 1991b: 295 for Keos; Spencer 1995b: 34 for Lesbos (*contra* the inaccurate generalisation of Burford 1993: 118). However, Dousougli & Morris 1994: 217 on Lefkas towers lying within 1km of the urban centre.

[11] Roy 1996: 109 suggests that, 'The term "isolated" is meant simply to convey "not part of a nucleated settlement", and not necessarily to suggest any extreme isolation in a very remote or wild situation; any farmstead standing alone, even if it has neighbours a few fields away, is in this sense isolated', but admits that 'while the farmstead standing alone ('isolated') can readily be contrasted with the village ('nucleated') settlement could be less clear-cut: two houses standing together in the countryside would constitute isolated rather than nucleated settlement, but clearly a cluster of houses in a group smaller than a village might pose problems of definition.' However, this study has argued for a more fluid relation between a spectrum of rural sites and settlement in a 'patchwork' landscape.

[12] Hansen 1995c: 69, noting a single reference to *komai* in Aristotle's *Constitution of Naxians*. For nucleated rural settlements on nineteenth-century Siphnos, see Ross 1840: 138-46; Fiedler 1841: 125-144; Leake 1856: 157; Bent 1965: 21-24; *cf.* Snodgrass 1987-9: 62-63 on the 'striking recent parallels' observed in the settlement patterns of nineteenth-century Cyclades and classical antiquity.

[13] De Angelis 1994: 96-99; Jameson, Runnels, van Andel 1994: 549-554 for estimates of urban populations according to site size and population density. Osborne 1996b: 167 (*cf.* Jameson, Runnels, van Andel 1994: 392-394)

cycle of individual sites, and the number inhabiting each site) might be drawn from the Siphnian towers (*Table 7.1*), but the parameters are too large to enable a realistic 'population' estimate.[14] Despite over a century of scholarly attempts to quantify the 'citizen' population of *poleis* and relate it to the 'carrying capacity' of their *chorai*, it is clear that carrying capacity estimates can only provide a hypothetical maximum figure, due to the number of variable factors at the micro-level of the countryside (soil type, hydrology, slope gradient, aspect, strategies of land use and type of crops grown).[15] This means that the question of the relative urban/rural population is often in reality unanswerable. However one conclusion of this thesis has been to suggest that scholarly preoccupation with 'residence' in the countryside of small *poleis* is misplaced, as formulated both by those in favour of predominantly 'nucleated' settlement,[16] and those who support 'dispersed' settlement.[17]

If the towers themselves do not therefore automatically account for a large resident, dispersed population in the classical period, archaeology can usefully direct attention towards a more flexible conception of the *oikos* in contexts outside the usual Athenian literary sources, integrating the multi-dimensional aspects of domestic social organisation within the spatial context of the *polis*.[18] Furthermore, the spatial dimension of these small *chorai*, when considered in combination with 'traditional' or 'alternative' models of land use (for example, mobile husbandry strategies integrated with agriculture) must allow for a more flexible range of possible structural relations between urban centres, rural investment, and household patterns of land use which do not determine

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estimates that the rural population of the southern Argolid is unlikely to have exceeded 10% in classical antiquity (also Cherry, Davis, Mantzourani 1991c: 337-338 for Koressos on Keos). Hanson 1995 also argues that a significant (but unquantified) percentage of *polis* populations in the Classical period lived in dispersed farmsteads, with a decline in the Hellenistic period, even though the majority of the archaeological material he cites is unlikely to date before the fifth-century BC, and in several cases appears Hellenistic in date.

[14] *viz.* Osborne 1985b: 126, 128, 'An attempt to make a direct calculation from the number of structures to the population, or even the agricultural work-force...is misconceived and doomed to failure in circumstances such as these...An increasing density of building in the countryside cannot be translated into a population figure or taken to indicate an increase in population. Only in a partial and qualified sense does more building indicate a change in residential preferences. But what the presence of rural structures does, surely, indicate is an intensity of land use, and historically that is likely to be as significant as any relative or absolute measure of population, if not more so.'

[15] De Angelis 1994, 1996: 106-112; Rackham & Moody 1996: 96-97 on limits of evidence. Beloch 1886: 176-182 for ancient population estimates of the Cyclades, giving an estimate of 2000 citizens for Siphnos (based on Athenian Empire tribute payments). However, see Nixon & Price 1990: 160-161.

[16] e.g. Alcock 1993: 96, 'Life in nucleated settlements was...always the preferred choice in Classical antiquity, with the *astu* as the chief center of population in most *poleis*. The discovery of unexpectedly numerous small Classical farmsteads may have once encouraged the notion of numerous people widely scattered throughout the *polis* territory; but that reconstruction fails to take sufficient account of settlement trends within the *polis* as a whole, and the actual demographic significance of dispersed settlement has now been somewhat tempered.'

[17] Brunet 1992: 50, in arguing for the importance of dispersed settlement, perceives an intellectual tradition traceable to Aristotle, 'Enfin, il apparaît que la position de principe, héritée d'Aristote et de Finley, qui vise à marginaliser (voire à nier) l'habitat dispersé dans la Grèce ancienne n'a pas sa raison d'être: à partir de la fin de l'époque classique au moins, cette forme de peuplement est une réalité du paysage grec.' However, it is arguable that her phrasing of the question indeed falls within the very same polarising tradition.

[18] *cf.* Sutton 1994: 322 for the fluidity of rural settlement terminology in ethnographic studies.

	POPULATION	PARAMETER
	5 people/household	**15 people/household**
SITE NUMBER PARAMETER	**low estimate**	**high estimate**
55 reported tower sites	275	825
hypothetical 100 sites	500	1500

Table 7.1: *Hypothetical parameters of a 'resident' rural population at tower sites, between current number of reported towers (55) and an estimated double number of sites.*
The parameters assume all sites are —residential sites occupied by a household comprising 5-15 individuals.
—inhabited simultaneously.

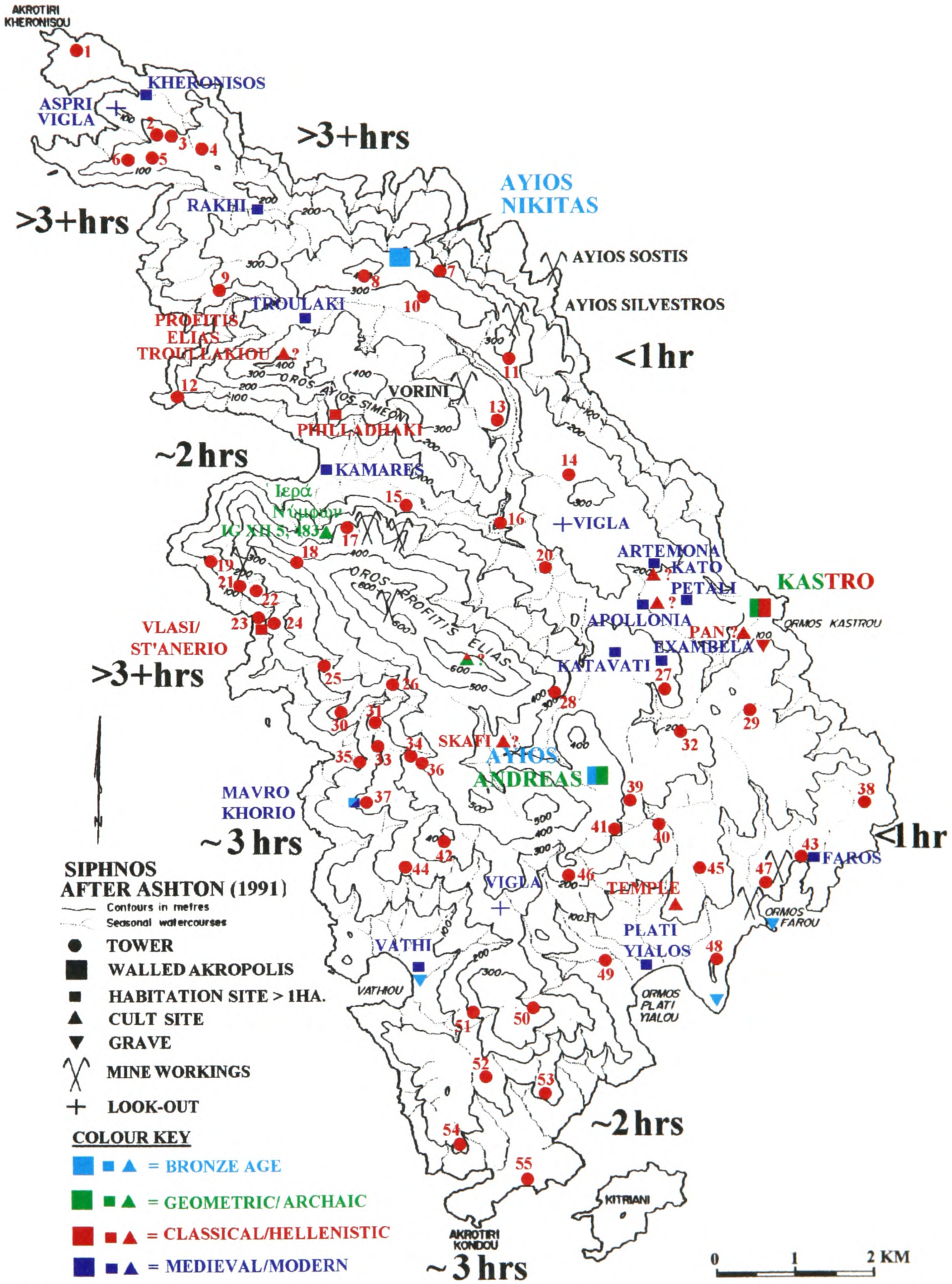

FIG. 7.1: *Map of Siphnos, marking locations of sites (cf. Fig.3.1, Fig.6.1) and indicating approximate walking distance (in hours) from asty at Kastro. Furthest locations in north and west 3-4 hrs from Kastro, illustrating the dimensions of territory.*

'extensive' farming according to commuting walking distance from a central place, or 'intensive' farming by rural 'homestead' residence. To concentrate on the narrow archaeological question of 'residence' in small polities as the key to understanding the social context of settlement patterns in ancient Greece is a modernism which fails to take sufficient account of the full spatial diversity of a functioning *oikos*.

Instead, formal models of settlement pattern (such as Central Place Theory), which tend to operate on a macro-level perspective and 'work-down' from the largest to smallest sites, must be revised to incorporate a perspective which builds from 'micro-level' modalities of human interaction with the landscape, in order to avoid the reductive dismissal of rural sites which do not fit the theoretical model as anomalies, 'that persist in apparently eccentric locations outside the general distribution of urban population'.[19] A strong urban centre and dense network of intercommunicating rural sites may co-exist,[20] and 'eccentric' locations (for example the sites of modern Siphnian potteries), upon closer archaeological inspection of surrounding *locales*, may in fact prove to be the epitome of rational decision making, even if they do not conform to expected predictions of 'nodes', 'networks' or 'hierarchies'.

Indeed, recent geographical theory, in reaction to the perceived inflexibility of the Central Place model, has instead advanced concepts of polycentrism, or 'mobile centralities' which find support in ethnographic and ethnoarchaeological studies of regional rural settlement in modern Greece,[21] and offer a counterpoint to theories which have focused upon traditional village settlement as the 'template' for the *polis*.[22] This more flexible, and fluid conception of settlement with regard to urban centres, a spectrum of rural sites, and the household might fruitfully be developed in future regional studies of ancient Greece, and as has been noted, may help distinguish between an otherwise 'undifferentiated mass of lesser order settlements' and a central place.[23]

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[19] Haggett, Cliff, Frey 1977: 177. As Schallin 1997: 17-22 notes, use of terms such as 'nucleation' and 'urban centres' as *synonyms* for central places has also led to conflation of separate, although related, phenomena.

[20] Wallace-Hadrill 1991: xiii.

[21] Lefebvre 1996: 106, 120 (*cf.* Collis 1986) for mobile centralities and 'the illusion of continuism and evolutionary ideology [which] have disguised the dialectical movement in the metamorphoses of cities, particularly in the relations of 'continuity-discontinuity'. Sutton 1988, 1994 for the transience of modern Greek rural settlement (see also above Ch.1).

[22] e.g. Kirsten 1956: 33, 132; Morris 1994c: 50; Osborne 1996b: 169. Thus Bintliff 1994a: 14, 'In essence and in origin the typical ancient Greek *polis* is simply a variant on the traditional Greek nucleated village.' However, see Sutton 1988: 208; 1994: 314 on the potential skewing factors of village studies based on assumed 'stability, longevity, and essential uniformity' (*cf.* Schwartz & Falconer 1994b; Lambrianides 1995). Sutton 1994: 325-327 on the transience of village settlements.

[23] Catling 1984: 100.

A more expansive, descriptive terminology which incorporates the subtleties of settlement revealed by anthropologists and ethnographers is crucial.[24] Survey archaeologists in particular have the opportunity to escape the Aristotelian straitjacket of household-village-*polis* hierarchy which continues to dominate in literary based studies.[25]

SOCIAL STRUCTURE OF THE ANCIENT COUNTRYSIDE

The case study of monumental rural sites broadly confirms the 'top-down' visibility of social structure in the archaeology of the ancient countryside.[26] Nor is it clear how an intensive survey would necessarily detect a broader spectrum of ancient society in the archaeological record (since by definition, the poorest members of society would likely be landless) or differentiate on-site remains between tenant-farmers or independent landowners, since assumptions based on the quality of pottery are rarely diagnostic due to the effects of orderly site abandonment on the subsequent paucity of site finds.[27]

Unfortunately, more precise evaluation of *political* status by archaeological evidence alone is hazardous, due to the phenomenon of equifinality. It is not clear that well-built, rural structures are symptomatic of a landed aristocracy exploiting a dependent peasantry.[28] Their appearance in polities throughout the Aegean and beyond makes it difficult to correlate their construction to specific *political* groups, whether aristocrats, oligarchs, hoplite-farmers, those with a desire of *apragmosyne*, exiles or misanthropes.[29] Nor is the archaeological landscape an accurate record of political hierarchy, since the status of inhabitants may not be recoverable from the archaeological record (or indeed, other types of evidence such as epigraphy).[30]

The general difficulty of applying archaeological evidence to test the 'consumer city' model has been acknowledged.[31] However, despite limitations of evidence, the case study has indicated how

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[24] Osborne 1996b: 169. The concept of a hamlet, 'a vague term seeming to indicate a very small, but year-round settlement lacking some of the amenities of a village' (Sutton 1994: 317), is particularly underdeveloped in Greek survey archaeology, yet is a feature of historical settlement patterns as κομίδια.

[25] e.g. Lowry 1987: 219 which uncritically accepts Aristotle's formulation of social organisation in *Politics*.

[26] Jameson 1994: 60-61.

[27] e.g. Mattingly 1988: 193 who interprets oilery sites in Roman Tripolitania as tenant farms according to the relative absence of fineware pottery in excavated rubbish dumps and the lack of 'conspicuous consumption of profits on site'. However, this methodology would not seem appropriate to a small *chora* where produce and producers might be readily movable, and the notion of 'household residence' (especially among the wealthy, and archaeologically visible) requires re-evaluation (see above p.225).

[28] As suggested by Garlan 1989: 139.

[29] e.g. Jameson 1994: 61 arguing that well provisioned rural sites (buildings, cisterns, walls etc.) relate to upper-middling classes; Balcer 1985: 35-36 interpreting Teian *pyrgoi* as aristocratic or oligarchic estates (see above pp.179-181).

[30] Layton 1972: 377.

[31] Mattingly 1997: 210-211.

the location of well-built rural sites can be interpreted in the economic geography of the ancient countryside, and in particular the intensive 'cash-crop' agriculture and pastoral activities of *eschatiai* (at least during the later Classical and Hellenistic period). The towers of Siphnos may thus offer a counterpoint to notions of subsistence cultivation in marginal areas, finding a parallel in the economic geography of Thasos, where the nexus of well-built rural sites and viticulture in the furthest areas of the countryside has been interpreted as a crucial dimension of land use, representative of a harmonious relationship between town and country.[32]

Such an observation about the type of land use leads to questions about the amount of land use and its control.[33] In the case of Siphnos, might the wealthy have exploited *eschatiai* as well as having access to the most fertile agricultural land nearest the *asty* in the south-east ? In general terms, is it possible to relate the social structure of a *polis* to agrarian geography ? Unfortunately, at the level of the *locale*, site catchment analysis between individual rural sites (in order to estimate the nominal area of land under 'control') remains speculative, and ultimately may be misleading, since this map-based 'flat' approach can easily overlook the 'vertical' dimension of landscape. Zawadzki had argued that holdings of less than 300 plethra would not possess towers.[34] However, there does not seem any direct correlation between plot size and monumental construction.[35] The hypothetical site catchment area of Siphnian tower clusters might be less than 5 ha. (e.g. **2-3**, **5-6**, **23-24**, **31-33**, **34-36**) or 10 ha. (**19-21-22**).[36]

Instead, the conclusion drawn from the case study has been the focus on the concept of *productivity*: the intensity of exploitation is not so much a case of *total* land use or *total* population. The exploitation of *eschatiai* was not a desperate extension of cultivable land under popular pressure, but the cultivation of an integrated landscape (which might contain rich micro-regions, as the Siphnian evidence illustrates) for cash crops which could serve not just the market of the *polis*, but could be integrated into the demands of the wider Aegean. As J.L. Davis notes, increased production of cash crops may have minimal effect on levels of subsistence production, since labour demands for cereal cultivation (e.g. harvest in early summer) may not conflict with labour demands for cash crops (such as the olive harvest in early winter).[37] It is encouraging that

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[32] Brunet 1992: 49.

[33] Foxhall 1992.

[34] Zawadzki 1960-1; Nowicka 1975: 16.

[35] Saprykin 1994: 6 for size of land plots in Khersonesos Taurike ranging from less than 4 ha. to over 60 ha., with no noticeable difference in tower construction. Steinhauer 1994: 175-183 for the distribution of ancient rural sites (approximately 1 per 10 ha.) in the region of Spata, Attika. For problems of evidence concerning landholdings, see in general, Finley 1985a: 97; Burford 1993: 66-73.

[36] *cf.* Jameson 1977-8: 125 for a nominal 'household' plot size at 3.6-5.4 hectares; Gallant 1991: 82-87 estimating 4-6 ha.; Foxhall 1997a (in relation to Solonian property classes) suggesting 17-28 ha. could produce 500 medimnoi of barley, 10-17 ha. for 300 medimnoi, 7-10 ha. for 200 medimnoi.

[37] Davis 1991: 140.

several historical studies are drawing upon insights into the elasticity of agricultural production contributed by ethnoarchaeological study.

Relating intensification and productivity to politics is not easy: in the case of Melos, Renfrew argued that external pressures (such as taxation demands upon a polity) provided the stimulus for the intensification of production: the more unequal the relationship, the greater the stimulus.[38] Studies of Hellenistic Delos and Ottoman Seriphos respectively have suggested that other factors (such as ownership of land by an elite minority) may influence productivity.[39] Evidence from the island's more recent settlement history during Venetian and Ottoman rule indicates an intensification of rural exploitation in the north and west of the island through the numerous *komidia* (e.g. Troulaki and Mavro Khorio); however, given the uncertainty concerning the political situation in the Hellenistic Cyclades, it is perhaps best to leave the interpretation of this case study in more general terms of productivity.

PROSPECTS FOR FUTURE RESEARCH

THE ARCHAEOLOGY OF MONUMENTALITY

That buildings did not make a *polis* was a topos of ancient literature, most notably expressed in Thoukydides' comparison between Sparta and Athens (I.10),[40] recognising that monumental architecture could not be judged as a passive index of *polis* power (δύναμις) and indeed acknowledging the role of monumentalisation to provide, 'the space in which to enact and contest claims to power and authority.'[41] Within a society, monumentalisation might constitute messages of social inclusion or exclusion, control access and claims to territorial legitimacy by individual or group actors within an 'architecture of memory'.[42]

Such expressions of monumentality have been fruitfully explored in cultic contexts,[43] often at the level of (inter)state territorial definition through 'peer polity' interaction.[44] However, archaeological survey offers the opportunity to investigate relationships between monumentality

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38 Renfrew 1982.

39 Reger 1994a; Davis 1991.

40 Rocchi 1981: 330.

41 Antonaccio 1993: 65.

42 Fabian 1983: 11. N.B. Sutton 1994: 322 on the power exerted by abandoned structures in the contemporary Greek countryside, 'Even the ruined houses of former hamlets and καλύβια give daily reminders that the patrilinies which used to live in them have a long-standing legitimacy in the valley.' *cf.* Fleming 1990: 9, 'Monuments...are relatively indestructible, and are not particularly easy to conceal. Their construction or alteration necessitates the revision of mental maps and may affect both those who have previously used the land and those who have conceived of it in a particular way.' See also Thomas 1993: 26; Tilley 1994: 202-204.

43 Antonnacio 1993.

44 Snodgrass 1980: 58, 1991a: 17.

and social praxis at other levels of society, including domestic and secular contexts,[45] as has happened in several recent cases of world archaeology.[46] In the example of the case study (a non-apoikic, single polity), where there was no need for territorial demarcation at state-level — its *chora* well defined by its insular location — it has been suggested that the archaeological evidence is best explained by *intra*-society conspicuous emulation and competition.

In this respect, recent explanatory models have postulated a particularly close association of monumentality with island societies, suggesting that conspicuous display and the construction of territorial markers may be a manifestation of resource competition, control and distribution within the limitations of an island ecosystem.[47] However, as discussion in Chapter 2 illustrated, such theories depend upon the premise of an isolated ecosystem: in cases where the populations of insular regions integrate into wider communication networks, it is by no means clear how appeal to a specifically geographical concept of 'insularity' can explain the archaeology of island populations.

THE ANCIENT GREEK COUNTRYSIDE: FUTURE RESEARCH

Regional archaeological survey offers the most practical means by which new evidence may answer questions long posed, but rarely faced in the history of the discipline, as Chapter 1 indicated. Multi-disciplinary approaches (including more environmental, scientific analysis) are crucial to opening out the 'totality' of human landscapes in a long-term perspective; survey archaeology can also expand the horizons of research from the small number of 'literary rich' urban areas towards a much more inclusive understanding of the ancient world, as recent publications have forcefully argued.[48] The importance of such work is put into often immediate perspective by industrial and tourist construction in areas of the Greek countryside: this is not another version of the discredited 'survivalist' approach to rural history and contemporary local

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[45] Spencer 1995b.

[46] On Sardinia, the Nuraghi towers are now seen as important symbolic monuments within the wider community, denoting a claim to land ownership by a particular group of persons and acting as territorial markers which represented the interests of diverse social groups on the island (Trump 1992; Becker 1992; Bonzani 1992). *viz.* Parker Pearson, Sharples, Mulville: 1996: 60, 66 on the archaeology of Iron Age Brochs (multi-storey towers approximately 10m in diameter) found in Scotland, 'The siting of a broch is a conscious statement which only makes sense within a social context. It does not deny a defensive and agricultural role but incorporates those roles within a fuller conception of the broch's social significance...Brochs embodied overtly hierarchical social mobilization and occupant numbers, their incorporation of height within the domestic setting, their defensive isolation, and perhaps the use of doorway orientation.'

[47] Patton 1996: 88-138 on 'cultural elaboration' in island societies.

[48] e.g. Alcock 1994; Bintliff 1997.

populations, but rather an acknowledgement of the importance of local co-operation with survey teams predominantly composed of, and directed by, non-nationals.[49]

In the specific example of the preceding case study, or indeed the recent appeals for survey on island polities such as Aegina and Andros,[50] intensive survey and palaoenvironmental analysis might illuminate off-site artefactual scatters and the question of 'manuring haloes', and enable further investigation of agriculture and animal husbandry in the vertical landscape. However, some points of caution are required.

Firstly, the enthusiasm of some practitioners of intensive survey archaeology to describe their work in terms of 'total coverage' of the rural landscape must be tempered by the effects of post-depositional destruction which creates a spectrum of archaeological visibility. Intensive survey must become aware that, however methodologically complex are its *minutiae* of survey procedure, basic questions of bias towards certain types of land use (e.g. agriculture versus animal husbandry) need to be addressed if it is to succeed in its aims of providing a more balanced picture of human involvement with the productive countryside. The 'vertical landscape', so crucial (and, one would have thought, so self-evident) to an understanding of a country such as Greece, must be more fully integrated in regional studies, not simply as a sterile improvement to the technique of surface survey, but as an opportunity to provide insights into 'traditional' and 'alternative' models of the ancient Greek countryside.[51]

Additionally, it is becoming increasingly evident from the 'new wave' of regional archaeological survey that (however well-intentioned) the enormous *time* investment required by participants — the deployment of numerous survey teams for several seasons in the field, followed by compilation, correlation and interpretation of survey finds — in the management of such research projects from proposal to publication (in comparison with much traditional research in the discipline) appears to have been seriously underestimated, due to the very laudable multi-disciplinary approaches which make such studies so worthwhile.

The prospect that a single regional survey project may soon constitute the greater part of a professional's working life could ironically lead down the same path of the unfinished excavation report which earlier survey had attempted to avoid. Certainly, new opportunities of 'on-line' publication and data storage can alleviate the tendency towards enormous (and expensive) multi-

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[49] Alcock, Cherry & Davis 1994: 137 on the effects of local building on rural survey; Fotiadis 1995 on survey projects and local populations. The absence of the Greek Archaeological Service from the account of scholarship in Chapter 1 is another telling aspect of archaeological priorities in Greece.

[50] e.g. Reger 1997: 21 n.82.

[51] Thus it is unfortunate that the study of Alcock, Cherry and Davis 1994, based on detailed data collection from the Nemea Valley survey project, does not engage the question of the vertical gradation of landscape in the case of agriculture and animal husbandry.

volume final publication, and improve the quality of available information (e.g. improved 3-dimensional landscape mapping, scanned colour photography, interactive cross references).

However, in retrospect of several survey projects, it is clear that even by circumscribing the parameters of study to a small regional territory (e.g. a classical city-state), the area selected was simply too large for the practical resources of survey, meaning that selective sampling techniques actually undercut the value in the 'regional' perspective.[52] The 'all or nothing' approach to regional studies therefore requires rethinking. At the 'theoretical' level of settlement and land use interpretation, a more inclusive, analytical approach to the flexibility of domestic organisation is required (as suggested above), beyond the terminology of 'isolated' rural sites and 'nucleated' or 'dispersed' settlement. Secondly, on the 'practical' level, studies ought to pay more attention to sub-regional perspectives: the matrix of *locales*, the interconnection of micro-regions which constitute the larger landscape.

The results of rural archaeological survey might usefully be directed towards an 'archaeology of neighbourhood', a concept which although salient in surviving literary sources from Hesiod to Attic orators,[53] has largely been neglected not only in urban archaeological studies, but also in contemporary anthropology and ethnography.[54]

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[52] e.g. the probabilistic sampling methods used on the whole landscape of Melos in Renfrew & Wagstaff 1982.

[53] Burford 1993: 64-66.

[54] As Koster 1977: 138 notes; see now Halstead 1990: 159 for ramifications of neighbourly relations in domestic life.

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ABBREVIATIONS

The following abbreviations (according to *Année Philologique*, and *Liddell & Scott* convention) have been adopted.

AA = Archäologischer Anzeiger.
AAA = Athens Annals of Archaeology.
ABSA = Annual of the British School at Athens.
AE =' Αρχαιολογικὴ ἐφημερίς.
AD = Αρχαιολόγικον Δέλτιον.
AJA = American Journal of Archaeology.
AM = Mitteilungen des Deutschen Archäeologischen Instituts Athenische Abteilung.
APF = Archiv für Papyrusforschung unf verwandte Gebiete.
ASNP = Annali della Scuola Normale Superiore di Pisa.
BAR **I.S.** *= British Archaeological Reports* **International Series**.
BCH = Bulletin de Correspondance Hellénique.
CAH = The Cambridge Ancient History. Cambridge.
CAJ = Cambridge Archaeological Journal.
CJ = Classical Journal.
CQ **N.S.** *= Classical Quarterly* **New Series**.
CR = Classical Review.
CSCA = California Studies in Classical Antiquity.
CW = Classical Weekly.
DHA = Dialogues d'histoire ancienne.
EMC = Échos du monde classique = Classical Views.
GBA = Gazette des beaux arts.
IJNA=International Journal of Nautical Archaeology
JFA = Journal of Field Archaeology.
JMA = Journal of Mediterranean Archaeology.
JHS = Journal of Hellenic Studies.
JMA = Journal of Mediterranean Archaeology.
JRS = Journal of Roman Studies.
MASCAJ = Museum Applied Center for Archaeology Journal (University Museum of Archaeology and Anthropology, University of Pennsylvania).
MB = Musée Belge.
MHR = Mediterranean Historical Review.
MJbK = Müncher Jahrbuch der bildenden Kunst.
OJA = Oxford Journal of Archaeology.
PAA = Πρακτικὰ τῆς' Ακαδημίας' Αθηνῶν.
PAE = ΠΡΑΚΤΙΚΑ ΤΗΣ ΕΝ ΑΘΗΝΑΙΣ ΑΡΧΑΙΟΛΟΓΙΚΗΣ ΕΤΑΙΡΕΙΑΣ.
PBSR = Papers of the British School at Rome.
PCPhS = Proceedings of the Cambridge Philological Society.
RA = Revue archéologique.
RE = Paulys Real-Encyclopädie der Classischen Altertumswissenschaft.
REA = Revue des études anciennes.
REG = Revue des études grecques.
RhM = Rheinisches Museum.
SPAW = Sitzungsberichte der Preussischen Akademie der Wissenschaften.
TAPhA = Transactions and Proceedings of the American Philological Association.
VAHD= Vjesnik za archeoliju i historiju dalmatinsku.
ZPE = Zeitschrift für Paypyrologie und Epigraphik.

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