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An Exploration of the Social Roles of Plants in the Bronze Age Aegean.

Vol. I: Text

Joanna Day

This thesis is submitted in fulfilment of the requirements for the degree of Doctor of Philosophy.

Trinity College Dublin

2007

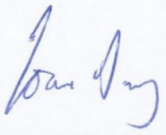
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Joanna Day

Summary

This thesis explores the role of flowers in the Aegean world during the Bronze Age. The focus is on Minoan Crete in particular, but evidence from contemporary societies in the Cyclades, the Near East and Egypt is also utilised.

Chapters one and two form a complementary pair, examining how flowers, and representations of flowers, have been treated in academic work. The first chapter discusses the development of palaeobotany in Greece from the earliest days of excavation to modern methodologies. The research goals of archaeologists have changed over time, and are reflected in the questions asked of palaeobotanical material. A survey of a century of palaeobotanical publication in an established journal, the *BSA*, illustrates both the increasing role of such work as well as the changing issues driving the research.

Chapter two turns away from physical remains of plant material to consider how scholarship has traditionally analysed floral iconography of the Bronze Age. Key issues are discussed, such as identification of species and the apparent naturalism of many depictions. Several new topics are also examined, including the possibility of plant trade in the eastern Mediterranean at this time. A consideration of the iconography of economically useful plants (e.g. olives, grains), a subject usually overlooked by scholars, is included as Appendix I.

Following this history of the study of plants, the thesis turns to examining other potential ways to explore the Minoan plant world. In chapter three, the discipline of ethnobotany is introduced, and the applicability of its methods to an extinct culture is assessed. While not all methods are equally successful, consideration of the different types of questions which ethnobotanists ask allows an exploration of new areas for Minoan studies: what was a Bronze Age conception of nature, and how did the Minoans classify the plant world?

Moving from the general to the specific, chapter four focuses on one particular plant, the crocus, and its by-product, saffron. A catalogue of crocuses in frescoes is included, and the chronological development of the motif in ceramics is studied. Other materials are also investigated for crocus motifs, leading to the first fully comprehensive study of the flower. Its potential uses are discussed, with a view to understanding why this flower apparently played an important role in Minoan culture.

That Minoan palaces featured gardens has long been accepted by archaeologists, but little work has ever been done on the actual evidence for this. Chapter five

researches this issue, and uses archaeological remains, combined with wall paintings, ceramics, and a study of the water supply. While little direct proof can be found, comparative work indicates that the Minoans certainly would have been unusual had gardens not been created for elites, and the role of plants as bearers of prestige is stressed.

The final chapter is inspired by recent work on sensory archaeology, and examines alternative ways to understand Minoan floral artefacts. Two case studies of multi-sensory analyses are included: ceramic vessels with floral relief, and room Delta 2 from Akrotiri. The rest of the chapter deals with a more speculative issue, and one which has been ignored by Aegean archaeologists: whether any plants were used for their psychotropic effects.

Overall, this work aims to advance the study of the Minoan relationship with the plant world, asking new questions of the material and progressing beyond typological analysis. The multiplicity of ways in which plants could have been important is highlighted throughout, and the ways in which they inform, and are informed by, a society's beliefs and values are demonstrated.

Acknowledgements

There are a number of people without whom this thesis could never have been completed and I wish to express my heartfelt thanks to all of them.

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Abbreviations

Abbreviations used in text:

EM: Early Minoan

MM: Middle Minoan

LM: Late Minoan

CMS: *Corpus der Minoischen und Mykenischen Siegel.*

KFA: *Knossos Fresco Atlas* (Cameron and Hood 1967).

PM: *Palace of Minos* (Evans 1921-1935)

Thera: *Excavations at Thera* I - VII (Marinatos 1968-1976)

Journal Abbreviations:

AA	Archäologischer Anzeiger
AAA	Athens Annals of Archaeology
AJA	American Journal of Archaeology
AR	Archaeological Reports
ASAtene	Annuario della Scuola archeologica di Atene e delle Missioni italiane in Oriente
BASOR	Bulletin of the American Schools of Oriental Research
BCH	Bulletin de Correspondance Hellénique
BSA	Annual of the British School at Athens
CAJ	Cambridge Archaeological Journal
Hesp.	Hesperia
JDAI	Jahrbuch des Deutschen Archäologischen Instituts
JEA	Journal of Egyptian Archaeology
JFA	Journal of Field Archaeology
JHS	Journal of Hellenic Studies
JNES	Journal of Near Eastern Studies
KMT	KMT. A Modern Journal of Ancient Egypt
OJA	Oxford Journal of Archaeology
RA	Revue Archéologique
REA	Revue des Études Anciennes
SMEA	Studi Micenei ed Egeo-Anatolici

Special Abbreviations:

Aegean and Orient: E.H. Cline and D. Harris-Cline (eds.) (1998) *The Aegean and the Orient in the Second Millennium.* Aegaeum 18. Liège: Université de Liège.

Annales: R. Laffineur (ed.) (1990) *Annales d'Archaéologie de la Grèce antique.* Aegaeum 6. Liège: Université de Liège.

EIKON: R. Laffineur and J. Crowley (eds.) (1992) EIKON. *Aegean Bronze Age Iconography: Shaping a Methodology.* Aegaeum 8. Liège: Université de Liège.

Empire of the Senses: D. Howes (ed.) (2005) *Empire of the Senses. The Sensual Culture Reader*. Oxford and New York: Berg.

L'Iconographie: P. Darcque and J-C. Poursat (eds.) (1985) *L'Iconographie Minoenne. Actes de la Table Ronde d'Athènes (21-22 avril 1983)*. BCH Suppl. 11. Athènes: École française d'Athènes; Paris: Diffusion de Boccard.

Meletemata: P. Betancourt, V. Karageorghis, R. Laffineur and W-D. Niemeier (eds.) (1999) *Meletemata: Studies in Aegean Archaeology Presented to Malcom H. Wiener as he Enters his 65th Year*. Aegaeum 20. 3 vols. Liège: Université de Liège.

Monuments of Minos: J. Driessen, I. Schoep and R. Laffineur (eds.) (2002) *Monuments of Minos: Rethinking the Minoan Palaces*. Aegaeum 23. Liège: Université de Liège.

Nature and Society: P. Descola and G. Pàlsson (eds.) (1996) *Nature and Society. Anthropological Perspectives*. London and New York: Routledge.

Palaeodiet: S. Vaughan and W. Coulson (eds.) (2000) *Palaeodiet in the Aegean*. Oxford: Oxbow Books.

Politeia: R. Laffineur and W-D. Niemeier (eds.) (1995) *Politeia. Society and State in the Aegean Bronze Age*. Aegaeum 12. Liège: Université de Liège.

Potnia: R. Laffineur and R. Hägg (eds.) (2001) *Potnia. Deities and Religion in the Aegean Bronze Age*. Aegeaum 22. Liège: Université de Liège.

TAW I: C. Doumas (ed.) (1978) *Thera and the Aegean World I. Papers Presented at the Second International Scientific Congress, Santorini, Greece. August 1978*. London: Thera and the Aegean World.

TAW II: C. Doumas (ed.) (1980) *Thera and the Aegean World II*. London: Thera and the Aegean World.

TAW III.1: D. Hardy, C. Doumas, J. Sakellarakis, and P. Warren (eds.) (1990) *Thera and the Aegean World III(1) Archaeology. Proceedings of the 3rd International Congress, Santorini, Greece. 3-9 September 1989*. London: The Thera Foundation.

TAW III. 2: D. Hardy, J. Keller, V. Galanopoulos, N. Flemming and T. Druitt (eds.) (1990) *Thera and the Aegean World III(2) Earth Sciences. Proceedings of the 3rd International Congress, Santorini, Greece. 3-9 September 1989*. London: Thera Foundation.

TEXNH: R. Laffineur and P. Betancourt (eds.) (1997) *TEXNH. Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age*. Aegaeum 16. Liège: Université de Liège.

Transition: R. Laffineur (ed.) (1989) *Transition. Le Monde Égéen du Bronze Moyen au Bronze Recent*. Aegaeum 3. Liège: Université de Liège.

Wall-Paintings: S. Sherratt (ed.) (2000) *The Wall-paintings of Thera. Proceedings of the 1st International Symposium, Petros Nomikos Conference Centre, Thera, Hellas; 30/08 - 4/09 1997*. Piraeus: Petros M. Nomikos and The Thera Foundation.

Aegean Bronze Age Chronology

(adapted from Dickinson 1994: fig. 1.3)

EM I	3300-2900 BC
EM IIa	2900-2550 BC
EM IIb	2550-2300 BC
EM III/MM Ia	2300-1900 BC
MM Ib/MM IIa- MMIIIb/MM IIIa	1900-1700 BC
MM IIIb	1700-1600 BC
LM Ia/LM Ib	1600-1450 BC
LM II/LM IIIa1	1450-1350 BC
LM IIIa2/LM IIIb	1350-1200 BC
LM IIIc	1200-1050 BC

Palatial Terminology

(adapted from Dickinson 1994: fig. 1.2)

Prepalatial	EM I-MM Ia
Protopalatial (1st Palace period)	MM Ib-MM IIIa
Neopalatial (2nd Palace period)	MM IIIb-LM Ib
Final/Mono Palatial (3rd Palace period)	LM II-LM IIIb
Postpalatial	LM IIIc

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Introduction

"la Crète ... peut-elle être considereé comme un pays d'épines et de senteur"
(Raulin 1869, vol. II: 82)

The French naturalist Raulin, in explaining why the Cretans wear exceptionally large sturdy boots, blames the island's thorny vegetation. The modern visitor will find the plant-life much unchanged since this observation, still challenging to those without sturdy footwear and thick trousers, but incredibly diverse in species. A recent survey of the flora on Crete found the island to contain 1624 species, an exceptionally rich plant-life for a relatively small island (Turland, Chilton and Press 1993: xii). Of these plants, at least 140 are endemics (i.e. they only grow on Crete), developed millennia ago during periods when the island was isolated from other land masses. Moreover, as it escaped glaciation, the island did not suffer the eradication of numerous species, as happened in colder, northern Europe (Shay and Shay 2004: 74). Perhaps the most famous example of a Cretan endemic is *Origanum dictamnus*, or dittany, which has been used medicinally since Antiquity and is now used to make a herbal tea reputed to have curative powers. Although generally accepted as having a Mediterranean climate, with mild, wet winters and hot, dry summers, Crete in fact is a land of diverse microclimates (Rackham and Moody 1996: 34). The island is dominated by various mountain ranges (White Mts., Psilorítis, Asterousia, Díkti, and Thrypthí, from west to east), whose plateaux, gorges, and slopes combine with lowlands and coastal areas to create a multiplicity of habitats for plants and animals (figs. 1-2). Little wonder then that the island has become renowned as a botanist's paradise.

The nature of Crete's vegetation and climate in the past is a more speculative matter. Pollen cores are the primary source for such information, but, as explained in chapter one, Crete is not rich in sites suitable for coring. From the limited evidence available, it seems that the island may have been wetter than at present until the end of the Early Bronze Age, when a climatic shift led to increasing aridity (Rackham and Moody 1996: 125-127). The cultivation of crops (cereals, olives and vines), as well as increased grazing in the Bronze Age, would obviously have affected the vegetation to some degree, but the garrigue, maquis and steppe landscape of modern Crete (figs. 3-4) seems to have existed in varying proportions since the Neolithic (Rackham and Moody 1996: 138). In effect, this means that the plants encountered by the previous inhabitants on a daily basis are just as likely to be seen by modern travellers.

For archaeologists, the plant-life has also featured large, not just because it is

encountered in the field, but because it makes its way into the art of the Bronze Age, also known as the Minoan period. A commonly held view is exemplified by that of two modern botanists: "They must have been flower lovers too, these Minoans, for the flowers that surround their cities, palaces, and villas are repeated in their arts: frescoes, paintings and pottery show such flowers as *Gynandriris sisyrinchium*, *Ranunculus asiaticus*, crocuses, sternbergias, the sea daffodil, with lilies, rushes, and olives, most delicately drawn and painted" (Huxley and Taylor 1977: 51). This concept of the Minoans as flower-lovers is one which has permeated studies of the civilisation which inhabited Crete several thousand years ago. The idea developed that the Minoans led a carefree existence in a world "whose characteristics were the love of life and nature" (Platon 1964: 28). This point of view was the result of combining an iconography where plants obviously play an important role, with the apparent lack of archaeological evidence for warfare, all amalgamated with an idea of the "Noble Savage" at one with the environment. While recent scholarship is not so rose-tinted, the relationship which the Minoans had with nature and their environment has never been fully explored. To carry out such an investigation is the main aim of this thesis.

The archaeological evidence used in this work comes from a broad chronological period, spanning most of the Bronze Age in Crete (see chronological chart). Following chronology as set out in Dickinson, this commences c.3300 BC with Early Minoan I (EM I), and carries on to c.1050 BC when Late Minoan IIIc ends (Dickinson 1994: 19). However, the majority of material referred to dates from the Palatial phases of Minoan society. The Protopalatial, or First Palace period, commenced c.1900 BC and was brought to a close c.1700 BC by severe earthquake destructions (MM Ib-MM IIIa). The Neopalatial period lasted until c.1450 BC, when once again an island-wide destruction occurred (MM IIIb-LM Ib). Knossos then experienced what is known as a Third Palace period (LM II-LM IIIb) until its final destruction c.1200 BC, but importantly, at some point during this phase the Mycenaeans established themselves on the island. Thus the Minoan art of the first two palace periods gave way to a different, more formal style, comparable with that found on mainland Greece at this time.

Bronze Age society on Crete did not exist in a vacuum, unaffected by neighbouring cultures or the beliefs of antecedent peoples. In seeking to understand a Minoan interaction with plants, it is important to consider both the time before the Neopalatial flourishing of Minoan society, and the time afterwards, when it morphed into a Minoan-Mycenaean culture. This will become especially apparent in chapter four, which is a case study of one specific plant (the

crocus) and its use as an artistic motif, tracing it from its iconographic debut to its demise. However, throughout this work, evidence which falls outside the Minoan palatial periods will be referred to where it can enhance knowledge. In particular, Linear B is used in several places. This script, which was used to keep records in Mycenaean palaces, contains references to a number of plants which otherwise do not survive in the archaeological record. Such a resource cannot be ignored in any quest for information about plants in the Bronze Age, but must be used with caution if extrapolating back in time to pre-Mycenaean society. Caution must also be applied when using material from other locations to draw conclusions about Minoan Crete. In particular this applies to Akrotiri on Thera. The precise nature of the Cretan-Theran links are still elusive, but that links existed is certain. The iconography on frescoes and ceramics found buried beneath the volcanic debris at Akrotiri owes much to that of the Minoans, yet also exhibits Cycladic characteristics. Indeed, other Cycladic sites like Ayia Irini (Keos) and Phylakopi (Melos), as well as Kythera and Rhodes further afield also make useful contributions to any study of Minoan iconography. The spread of a distinctly Minoan style, especially in wall painting, can be detected right across the eastern Mediterranean, and examples from sites in both Egypt and the Near East are also employed where useful.

Interestingly, the iconography of the Mycenaean mainland does not place the same emphasis on flowers and plants as is found in Crete. All the main palace sites have produced fresco fragments, with the majority dating to LH IIIb, although traces of earlier paintings can be found, especially in the houses outside the citadel walls at Mycenae and the plaster dumps at Pylos and Tiryns (Immerwahr 1990: 105-106). However there are no wall paintings dating from a time contemporary with the Neopalatial on Crete, perhaps suggesting that the art made its way to the mainland from Crete late in the Bronze Age, maybe via the Cyclades. Although more formal in style than Minoan scenes, certain familiar themes appear: processions, elaborate dress, griffins. There is also an emphasis on warfare, chariots and hunting, themes not popular in Minoan Crete (Immerwahr 1990: 109). Trees appear highly stylised, e.g. in the fresco from Tiryns where they stand perfectly aligned behind chariots (Rodenwaldt 1976: pl. XII). Women processing at Pylos and Thebes hold flowers in their hands (Lang 1969 : pl. O; Stevenson-Smith 1965: fig. 116), while the papyrus and spiral decorative frieze is found in all the palaces except Pylos (Immerwahr 1990: 142; fig. 39). But there are no scenes purely of plants, nothing to compare with the sprawling nature of the House of the Frescoes scenes or those at Ayia Triadha. Crocuses, an especially prevalent plant in Cretan frescoes, do not appear on the mainland, with perhaps one exception

(see chapter four). This lack of flowers can be noted in mainland ceramics too, where the proliferation of floral motifs which is a feature of Minoan pottery from the Middle Bronze Age onwards is not replicated. Only in Late Helladic II-III do flowers become part of the mainland ceramic tradition, and stylised papyrus and lilies can be found on vessels. The popularity of these two species can also be noted in seals and metalwork, again differentiating the Mainland from Crete, where a much broader range of floral motifs was always utilised. Investigating why the Minoans used floral decoration to such an extent is another of the aims of this thesis. Whatever the reason for creating such scenes in the first place on Crete, it seems that they did not appeal to Mycenaean culture. It must be seriously considered therefore that such scenes and motifs held meanings beyond mere decoration for the Minoans, meanings which did not translate into Mycenaean culture and were replaced with more relevant ones in later art and society.

While investigating a Minoan concept of the plant world is the ultimate goal of this thesis, it is important to examine initially how scholarship has traditionally thought about plants in Bronze Age society. The first two chapters of this work form a complementary pair, and analyse the ways in which archaeologists have gone about studying the roles of plants, both real ones and artistic motifs, from this period. Chapter one is a broad-ranging survey of how Aegean archaeology has dealt with botanical questions and material throughout the twentieth century. From such a study, it becomes possible not only to discuss the types of plant remains which have been found, but more interestingly to see what types of questions have concerned Aegeanists over the years. This chapter discusses the botanical material recovered from excavations of Bronze Age sites, and is accompanied by an up-to-date table which collects all the published archaeobotanical remains. Palaeobotanical methods used to recover the material are explained, with a particular focus on how such techniques have been applied in the Aegean area. The types of questions typically asked of botanical material are assessed, and linked with the theoretical and technical developments within the discipline. The rise of archaeological field survey in the Aegean has undoubtedly contributed to vegetation studies, and the new types of information available from these projects are examined, along with results of palynological work on Crete. To underline the changing role of palaeobotany and vegetation studies in Aegean archaeology on a broad diachronic scale, a decade-by-decade analysis of a specific publication (the *BSA*) completes the first chapter.

Almost every culture that has ever existed on the earth has incorporated plants into its art in some way, and chapter two examines the 'imagined plants' of the

Aegean Bronze Age, i.e. those flowers and trees which were the products of artists, and which remain today as tangible evidence of an interest in the natural world, even if the reasons behind such imagery are poorly understood. The corpus of published material on Minoan art is enormous, and to discuss all the examples featuring plants would take many more pages than this work allows. It was also decided not to include rosettes or more general foliate motifs in the study. While perhaps florally-inspired, the impossibility of relating either of these to real plants means that information about human-plant interaction cannot be accessed from these sources. The plethora of examples of these motifs throughout the Bronze Age would also require a separate study to do them justice. To deal with the remaining vast body of plant information, the material is examined using a number of different themes which have occupied scholarly minds over the last century. These include the identification of plant species in Minoan art, which is linked with the question of realism and naturalism in the depictions, and also the related issue of hybridisation. Whether some plants were domesticated or cultivated is also considered. A study of the iconography of those plants which are visible palaeobotanically (mainly food plants) is included as Appendix I. This is the first time the range of depictions of these plants has been noted. Naturally, wider themes emerge from an iconographic study of plants; for example, the similarity of floral motifs throughout a wide geographical range has long been remarked upon, and possible reasons for this are reviewed, including new suggestions about the role of 'travelling plants' in the Bronze Age. Finally, the questions surrounding the functions of Minoan wall-painting, with particular emphasis on the nature scenes, are discussed.

From these twin pillars of traditional scholarship, palaeobotany and iconography, it emerges that studies of plants in the Aegean Bronze Age have rarely ventured beyond viewing them as food sources or interesting decoration for ceramics or walls, despite the wealth of ethnographic evidence telling of the multiple roles plants can play in society. Use of ethnographic analogy is a practice surrounded by debate within archaeological circles. That "analogical reasoning is peculiarly liable to yield false conclusions from true premises" (Lewis-Williams 1998: 151) should not lead to despair. While an analogy can never actually prove anything, it should be understood more as a "theory-construction tool" (Charlton 1981: 131) and so can function as a springboard for new ideas. Johnson has noted that Middle Range Theory may be "relatively plausible for areas of the archaeological record that are governed by or dependent on physical or biological processes" (Johnson 1999: 56). Regarding plants then, the fact that their basic biological properties have not changed since the Bronze Age makes utilising ethnographic (and pharmacological)

studies a viable option. Indeed, chapter four of this work includes an ethnographic study carried out by the author, illustrating the value of such projects for plant-related queries. While the precise cultural beliefs surrounding plants probably will never be ascertained through analogy, at least the wide range of such beliefs can be demonstrated, and thinking beyond the narrow realms of subsistence and 'usefulness' for plant roles in society is encouraged.

When considering Minoan plant representations and any role they and real plants may have played in Bronze Age life, it is necessary also to engage in reflexive thinking, and examine the establishment of the modern vantage-point from which the plants are considered. The aim of such explorations is to show how the current position *vis-à-vis* plants has been attained: what have been the key influences on Western thought about plants, and indeed, on Western depictions of plants? The rise of botany as a discipline is considered in chapter three, from Classical texts to modern studies, and the integral part that medicine, and in particular the tradition of illustrated herbals, has played in the study of plants is discussed. The history of the illustration of plants is also examined, as crucially it is out of this tradition that Western eyes view material of the past, including the Aegean Bronze Age. The debate about the species of plants in Minoan art has raged for many years, but such an inherent assumption of deliberate realism must be queried rather than unquestioningly accepted. A big contradiction therefore which lies at the heart of this thesis is that, although assumptions of naturalism in Minoan art are questioned, the terminology used to discuss the plants remains that of a century of archaeologists, i.e. crocus, lily, palm. As labels to group together images of plants of similar appearance, they suffice. But, as explained in chapter three, a Minoan concept of 'crocus' may well have been totally different from a modern one.

To examine the role of plants in Bronze Age life in an innovative way, it was decided to experiment with the methods and theories established in the discipline of ethnobotany, a sub-group of ethnography focusing on people-plant interaction. Ethnobotany has developed to enable comprehensive studies of this interaction, and the suitability of applying its methodologies to a 'dead' society, i.e. the Minoans, is of central concern to this thesis. A key problem which must be acknowledged is the fact that ethnobotanical surveys have tended to be carried out in small-scale societies living a pre-industrial, non-urban life. Thus using such studies as analogies to apply to the Minoans means that like is not necessarily being compared with like. However, the questions asked and the methodologies used in ethnobotany offer a different and fruitful way to approach the Bronze Age

material, and as it is these very methods which are considered here as opposed to the results, the uneven comparison does not constitute a problem. To what extent traditional archaeological analyses of plants from the Bronze Age, as discussed in chapters one and two, differ from an ethnobotanical survey is examined using two case-studies: Kommos in Crete and the Waimiri Atroari in Brazil. This allows a comparison of research goals, methodologies and results, as well as an assessment of the benefits to archaeology of using a more ethnobotanical approach.

Two theoretical issues which ethnobotany brings to the fore are firstly, how do societies conceptualise 'nature', and secondly, how do they classify the natural world? It is not possible to search for a culture's relationship with plants without at least considering how they might have viewed 'nature' as a whole, an issue thus far ignored for the Aegean Bronze Age. The nature-culture dichotomy is ultimately unsatisfactory however, and such simple dualist categories may be neither valid nor useful when dealing with a Bronze Age society, as has been discovered for many 'primitive' cultures around the globe. But how can the rather nebulous concept of 'nature' be understood for a society not just spatially, but temporally, removed from Western academia? Recent anthropological ideas on the matter provide more fruitful ways to think, and are used to consider a Minoan 'nature-view'. Narrowing the focus from the cosmos to the variety of plant life within an environment, the question of ethnotaxonomy arises. To perceive the environment as Minoans did is impossible, yet ethnobiological work has suggested modes of classification which appear to be human universals. Exploring these, it is possible to consider how plants may have been ordered or conceptualised in a Bronze Age society. Once more, such issues are a new departure for Aegean archaeology, and while many conclusions are tentative, even to ponder these questions opens up a whole new area for debate.

Turning from the general to the specific, a detailed case-study of a specific plant makes up chapter four, which explores both its development as an artistic motif, and the multiplicity of meanings it could have held in Aegean society. While any one of a number of different plants could have been selected, the crocus was chosen as potentially a more interesting one for study. The crocus is perhaps the plant which has caused the most discussion in the scholarly community, and the need for further writing on the issue could be questioned. However, many of the articles on the subject have approached it from one particular angle; for example, trying to prove saffron's medicinal use, or the crocus's role as a cult symbol, or an indicator of cultivation. This study takes a more holistic view, inspired by

ethnobotanical work, and suggests that the crocus, and saffron, could have functioned on many different and not mutually exclusive levels in society. Furthermore, commentators have tended to draw their conclusions solely based on frescoes, in particular those of Xeste 3 at Akrotiri, and ignored the other contexts in which the plant appears, a situation remedied in this work.

Gardens are a key location for human-plant interaction, and are common to vast numbers of societies across time and space. That Minoans did have gardens seems to be assumed by a number of commentators, yet they generally base this assumption on slender evidence, or even just a gut feeling. In fact, only three scholarly works focus specifically on this issue: Schäfer (1995 and 1989) and Shaw (1993). For the first time, all the evidence for Minoan gardens is gathered together below and assessed in chapter five, including ceramics, water supply, architecture and iconographic traces. That different cultures have different concepts of what a garden actually is must always be borne in mind however, and this point is explored in relation to the ancient Mediterranean and the diverse meanings assigned to gardens there. Furthermore, gardens have been acknowledged as "profound expressions of ideas and meanings" (Strong 2000a: 14) and always add up to more than the total of the plants therein. They can be expressions of wealth, power, control over nature, access to resources and ideas, and as such studying garden design can illuminate the social order (e.g. Leone 1984). That gardens were one more aspect of elite society during the Bronze Age of the Aegean is suggested, and the contribution of plants to a knowledge-based social stratification is considered.

Apart from the thorny vegetation, Raulin also remarked on the "senteur" of Crete, the aroma still evident today on any hike across the island. This draws attention to an underestimated property of flowers and plants: their multisensory appeal. While the dominant role of vision in twentieth century scholarship has been recognised and criticised (e.g. Classen 1993), as yet little has emerged to replace it in Aegean studies. The final chapter of this thesis considers a different aspect of 'flower power', namely the effect both of real plants and of their depictions on the full range of human senses. While it may be obvious that a visitor to a Minoan garden would undoubtedly be affected by smells, sounds and the feel on skin of the plants, the effect of floral artefacts is perhaps more subtle. Kamares ware vessels with relief floral decoration are an intriguing class of ceramics, and their potential multisensory appeal is explored. Delta 2 from Akrotiri, the room of the Spring Fresco, is also considered for its appeal beyond the purely visual, and demonstrates how flowers could have been at the very

heart of Minoan society. Ultimately, the observation that "the very course of human culture has been deeply influenced by plants" (Balick and Cox 1996: vii) is shown to hold true for the Bronze Age Aegean in a variety of ways, although the power of flowers has not, as yet, been truly appreciated by archaeologists.

Chapter 1: Palaeobotany, Environmental Studies and the Aegean Bronze Age.

> "Yet, though in reality very kind to what vegetation it does produce, the Akrotiri is mainly a great garden of wild herbs and wild flowers matting themselves thickly together in the red earth, which lies thinly on the substratum of hard rock. The air comes to one's lungs fresh and perfumed, and there is no odour of civilization to which this Akrotiri perfume is to be likened. The mandragora, with its tight-packed lilac flowers and thick hirsute leaves, grows here, but not so profusely as in the ravines below Khalepa. Asphodels are in the same case with the mandrake: the prickly herbs seem to bruise those stately necks of theirs which carry their pale pink head-clusters. But there are myriads on myriads of balsamic roses with viscid stems; tiny crocuses, intoxicatingly sweet, and with black pencillings on their blue petals as delicate as their scent; tender anemones, scarlet, crimson, blue and white as the snow-mountains which look upon them; orchids of kinds I have never seen before, and of many colours; and masses of yellow honey-flower which the bees take in quick succession, and never fail, it would seem, to find rich in sugar secretions. These are some of Akrotiri's bloom. Its wild thyme, mint, and other herbs, are to the full as powerfully sweet as its flowers. So you may conceive that a walk here has its charms." (Edwards 1887: 120-121)

1.1 Palaeobotany in Greece

Palaeobotanical remains seem to have always been of a relatively ephemeral nature in Greece, compared to those from arid Egypt, or the waterlogged sites of northern Europe. Certainly, palaeobotanical studies in these regions commenced well before those in Greece; for example, investigations in Poland and Russia started in the 1920s, while Hungary boasts a palaeobotanical analysis of Aggtelek cave from 1876 (Wasylikowa *et al.* 1991: 207-208), and Victorian Egyptologists were used to recovering dessicated flowers from the dry tombs of the Egyptian elite. During the last twenty or thirty years, techniques used to recover and analyse fragments of plant material have become more refined, and now a wide variety of information can be gained from such remains in the Aegean also, if adequate resources are provided for investigations of this nature. This section discusses the types of plant remains recovered from excavations on Crete throughout the twentieth century, incorporating an introduction to, and the development of, the palaeobotanical methods utilised, as well as the accompanying research agenda. The theoretical tides flowing around these various developments are also discussed, allowing an understanding of why particular questions have been asked of the material.

History of palaeobotanical theory and practice as applied to Greece

Early excavations on Crete occasionally came across small quantities of botanical

remains (e.g. Haussoullier 1880; Chapouthier and Charbonneaux 1928). These were usually described by a line or two in the archaeological reports, sandwiched in amongst the discoveries of palaces and pottery. It is hardly surprising, with so many other exciting developments to record, that a few grains of wheat or carbonised peas received no more than a brief mention at this time. Other instances note the discovery of organic remains of some type, but no further analysis was carried out, such as Evans at Psychro (PM II.1: 135, n.1). Clearly the excavation techniques of the time did not allow for the recovery of much in the way of botanical remains. Only with the later development of flotation devices was the amount of palaeobotanical material recovered increased dramatically. Evans, Chapouthier and their fellow early excavators did no more than identify what they found, adding this sparse information to the growing mass of data on Minoan Crete.

This simple describing of botanical material remained the norm for much of the twentieth century. It was the advent of 'New Archaeology', with its insistence on 'science', and the accompanying development of new laboratory techniques, that allowed palaeobotany to really find its feet. Interestingly, this phenomenon of lab-work bursting onto the archaeological scene had the far-reaching effect of physically separating the scientists from non-lab-based archaeologists (Johnson 1999: 35). This then was reflected in the manner in which scientific results were published, i.e. palaeobotanical or faunal information was generally added on to archaeological publications as appendices. A look through reports from Crete from the 1970s and 1980s illustrates this practice (e.g. J. Renfrew 1972; G. Jones 1984).

Much of this early research using these new technologies was aimed at answering questions of an economic type - subsistence, diet, and the economic organisation of past societies, as well as infrequent forays into ancient climate (Davidson 1988: 19) The economic approach was influenced by the work of Grahame Clark, who had been interested in "the interplay between culture, habitat and biome, as illustrated by the food and raw materials consumed by prehistoric societies." (Clark 1953: 151). Clark believed that a study of how humans adapted to their environment would allow the archaeologist to understand different aspects of society (Renfrew and Bahn 1996: 35). Following in Clark's footsteps came a group of archaeologists, based mainly at Cambridge in the 1970's, who were involved in a British Academy research project on the history of agriculture in Europe (e.g. Higgs 1972 and 1975).

Work in the Aegean could not but be influenced by these trends, unsurprising considering the traditional close ties between Britain and Greek archaeology, and publications soon began to report palaeobotanical investigations in greater detail than before. For example, the excavations at Franchthi cave in the Argolid were at the forefront in applying the technique of flotation to retrieve palaeobotanical remains (Hansen 1991). In fact, this project still stands out from numerous more recent ones in Greece for its interdisciplinary approach. While the botanical remains from Franchthi were used in the debate about the transition from a hunter-gatherer lifestyle to that of farming, there were other applications for such material. Processual archaeologists in Greece followed those elsewhere, and formulated theories about diet, food production and carrying capacity of the land, partly based on these botanical remains. Many of these early projects were conducted in northern Greece, at Neolithic sites like Achilleion, Sesklo and Sitagroi, again hoping to illuminate the debate on the beginnings of agriculture.[1] How humans responded to their environment, and the dietary and cultivation options available to ancient societies were the kind of questions such studies addressed (Vaughan 2000: 2). Botanical remains were treated as scientific data, with little consideration for the fact that food and plants have cultural meanings and roles as well as providing calories for human and animals.

A core preoccupation amongst Aegean archaeologists was the question of the domestication of various crops. Renfrew summed up what was driving this quest: "The development in the subsistence system ... is one of the fundamental changes in the overall culture system which permitted the emergence of civilisation"(C. Renfrew 1972: 265). For Minoan Crete, it was suggested that the redistributive system of palatial culture had grown out of the surplus created by domesticating olives and vines (C. Renfrew 1972: 305). Whenever palaeobotanical remains were recovered, archaeologists were interested in whether the grape pips were those of *Vitis vinifera* or *Vitis silvestris*, the domesticated or wild plant. Likewise, at precisely what stage the olive could be said to be domesticated prompted many debates (e.g. Runnels and Hansen 1986). For cereals, it is possible to chart their development also, from the simplest wild grains to the higher yield domesticated varieties of the late Bronze Age. Occasionally pulses were mentioned too, and recently their role has become better appreciated (e.g. Sarpaki 1992; Flint-Hamilton 1999). No other botanical remains aroused quite the same fervour in Minoan archaeology circles as these agricultural staples.

Broadly contemporary with the increase in laboratory work was the rise in the application of ethnographic analogy to archaeological questions. It was Lewis

[1] For bibliographic information on these sites, see Hansen 2000.

Binford who pioneered this approach (e.g. Binford 1983), and following his example, much middle-range theory was applied to researching the hunter-gatherer lifestyle. Adaptations were necessary to apply such theories to the Aegean Bronze Age, and it was soon realised that ethnographic work in rural Greece could offer new ways of thinking about agriculture in the past. Forbes's 1992 article outlines the challenges facing ethnographic studies in the Mediterranean, using olive cultivation as a case study. Paul Halstead stands out as another proponent of this practice (e.g. Halstead 1987), together with Glynis Jones (e.g. Halstead and Jones 1989), and Anaya Sarpaki (e.g. Sarpaki and Jones 1990). This trio has been at the forefront in using analogy to investigate crops and land-use in the Bronze Age. Ethnographic work persists today, and many archaeological projects now incorporate an ethnographic element to link the present and the past of the same region or site.[2] Certainly such "summer encounters with Cretan shepherds or Cycladic fishermen" can provide insights into agricultural practices, as well as being "valuable currency in competitive displays at academic conferences" (Halstead 1987: 77). It is important to realise though that rural life in Greece has not seamlessly passed through the ages without changing. It is also interesting to note that such ethnographic work has tended to focus on crops, especially cereals, and not to consider other types of plants and the uses to which they can be put (although see Clark Forbes 1976 for work on wild greens). An exception to this is Blitzer's all-encompassing study of agriculture and subsistence in the Western Mesara of Crete, which includes traditional crops and the multiple uses of wild plants in the area (Blitzer 2004).

Recently, new research agendas have been pushing Aegean palaeobotanical studies in different directions. Both the constant refining of analytical techniques, and the emergence of new theoretical concepts, have opened further avenues for exploration. It is really in the realm of microscopic and molecular palaeobotanical remains that spectacular advances have been made. Perhaps most famously in the Aegean, results from techniques such as gas and liquid chromatography, and mass and infra-red spectroscopy, were displayed in the *Flavours of their Times* exhibition (Tzedakis and Martlew 1999). Traces of olive oil, wine, pulses, herbs, cereals and fruits (as well as animal products) have been recognised by analysing pottery using the above methods. While some advise caution about these results (e.g. Hamilakis 2002a: 19), and indeed they still await peer-reviewed publication, this type of molecular analysis can only improve in the future, allowing ever more specific glimpses of the plants with which Bronze Age people interacted. There is also ongoing research into phytoliths (calcium or silica), recently demonstrated as a tool useful for identifying whether a vessel held olive oil or wine (Tyree 2000).

[2] See many of the archaeological surveys discussed in section 1.3 for related ethnographic studies.

Likewise, palynology is constantly adding to and updating information on the past environments of different regions. It is also important that palaeobotany is no longer confined to the "intellectual vacuum" Sarpaki noted operating throughout the 1960s, 1970s and 1980s (Sarpaki 2000a: 116). To adequately address the new issues, palaeobotanical material must be considered in tandem with artefacts (e.g. serving and storage vessels) with artistic representations of plants, and within its find context.

A note of circumspection is sounded by Hamilakis, however, who warns of the dangers of getting too wrapped up in these new toys, without first defining the research question (Hamilakis 2000: 60). The last thing Aegean archaeologists need is more and more pages of botanical data, with no pertinent questions asked. In fact, Hamilakis himself has been at the forefront of steering Aegean archaeology into new areas, influenced by anthropology and the social sciences. He points out how much traditional ecological archaeology has focused on questions of "procurement-production", while ignoring consumption (Hamilakis 2000: 56). The cultural context of consumption must be considered; for example, Hamilakis has studied feasting, showing how an investigation of this practice can inform the archaeologist not just about what was consumed, but about social relationships, power and identity (Hamilakis 2000: 61; Hamilakis 1999).[3] Sarpaki also has used palaeobotanical data to pose questions on a broader social scale, such as who owned or worked in the fields providing food for the West House of Akrotiri (Sarpaki 1990). It seems that archaeology in the twenty-first century may be realising that botanical remains can offer insights into a wider range of issues than has been perceived so far, and perhaps will start to ask more challenging and interesting questions of the material in the future.

Palaeobotanical remains from Crete

As was underlined above, much research has been carried out into agricultural staples in the Bronze Age. Yet, hand in hand with the influence of the prevailing theoretical issues of the time, another reason can be found for the dominance of the Mediterranean triad in palaeobotanical studies - namely the fact that grains, stones and pips are the remnants with the best chance of preservation, and therefore of discovery in excavation. Palaeobotanic remains can be divided into macrofossils, visible with the naked eye, and microfossils, requiring magnification before they can be seen. Different types of remains require different environmental conditions to ensure preservation, and some stand very little chance of preservation at all. Common types of macrofossils include charcoal, carbonised seeds, shells and grains, coprolites, root casts, impressions on clay, and

[3] See also Wright (ed.) 2004, and Halstead and Barrett (eds.) 2004.

mineralised or petrified remains; microscopic remains include pollen, phytoliths, and chemical traces.[4] As Pearsall notes, the analysis of botanical remains is a three-step process: recovery, identification and interpretation (Pearsall 2000: 11). Recovery rates of botanical evidence depend on the strategy of the excavation. Some remains will certainly be noticed during the digging process, although this will naturally be biased towards the larger pieces of material or those in vessels; for a more systematic method of recovery, the excavation may employ a flotation or screening practice (Pearsall 2000: 11). The identification of such remains is then dependent on analogies with modern flora (Dincauze 2000: 340). Once identified, interpretation can begin.

Table 1.1 shows the palaeobotanical remains unearthed in Crete. It can be seen that a large quantity of material is grain, usually discovered in carbonised form. Apart from any type of destruction by fire preserving material in this fashion, cereals are also likely to be accidentally carbonised as they undergo processing for consumption, often carried out with or near hearths and ovens (J. Renfrew 1973: 9). Sometimes the species of grain is not detailed by the excavators, a practice common in earlier studies (e.g. Dawkins and Laistner 1912-1913: 11). Elsewhere, and especially in more recent studies, it is possible to identify not just wheat, barley or oats, but the precise species, such as the bread wheat (*Triticum aestivum*) and emmer wheat (*Triticum dicoccum*) recognised at the Unexplored Mansion at Knossos (Jones 1984). Although reports from early excavations at Knossos and Mallia reported piles of grain on the floor (Evans 1900-1901: 21; Chapouthier and Charbonneaux 1928: 36), more often in Crete botanical remains were recovered from vessels; for example, in room XXV2 at Mallia, a small vessel was discovered containing an oinochoe along with carbonised grains (Chapouthier and Joly 1936: 22-23).

Pulses (legumes) form the other main category of palaeobotanical material recovered from Crete, and like grain, these are often found in vessels. Species of peas, beans, chickpeas, lentils and vetches all occur (Table 1.1), and it has been suggested that legumes played a very important role in early Mediterranean agriculture, especially during the late Bronze Age (Sarpaki 1992a; Hansen 2000). They can be used as a seed crop, which is dried and stored for human consumption; as a green crop, which is eaten fresh; and as a fodder crop for animals (Sarpaki 1992a: 71). Leguminous species also are useful in crop rotation, as they replenish the nitrogen in the soil. Whether this was carried out deliberately in the Bronze Age is uncertain, although it was certainly understood in Classical

[4] See Dincauze 2000, Evans and O'Connor 1999, and Pearsall 2000 for detailed information on types of palaeobotanical remains.

Greece, and implemented on a systematic level by the Romans (Sarpaki 1992a: 63; Isager and Skydsgaard 1992: 42-43).

The other members of the so-called 'Mediterranean triad', grapes and olives, have also been identified, although not in as great a number as cereals (Hamilakis 1996: Tables 1 and 2). In the case of olives, this could be due to the fact that the residue of pressing for oil (press-cake consisting mainly of crushed stones and skins) can be used for fuel, animal feed, and fertiliser and so would not survive (Mattingly 1996: 225). However, olive evidence has been recovered from a variety of sites, most spectacularly from a well at Zakros, where the whole fruit was preserved as fresh, until exposure to air caused them to wrinkle up (Platon 1985: 196-197). More usually it is the stones which survive, and intriguingly a fossilised olive stone has also been recovered from Myrtos Fournou Korifi (J. Renfrew 1972: 316).[5] It is impossible to distinguish morphologically between domesticated and wild olive stones, and likewise for its pollen (Hansen 1994: 185); evidence of cultivation therefore is based on remains connected with its processing, such as presses, storage jars, and in the Late Bronze Age, the Linear B tablets. Grape remains are not found particularly often, unless specific palaeobotanical recovery methods are used, due partly to their small size, but more particularly because of the lack of any procedure leading to carbonisation in their processing. Some were noted inside a pithos from Phaistos (Levi 1976: 114), and at Myrtos Fournou Korifi, pips as well as stalks and empty skins were found inside a pithos, leading to suggestions that this is early evidence for winemaking (J. Renfrew 1972: 315). The skins and pips found in a vat at Mochlos were preserved in an acidic potassium salt of tartaric acid, which occurs in fermentation, thus further proof of Minoan wine-making (Soles and Davaras 2004-2005: 103). Pips and skins have also been identified at Monastiraki (Tzedakis and Martlew 1999: 179).

Other remains include stones, pips and shells of fruits and nuts. Figs and almonds have been identified at Ayia Triadha (Vickery 1936: 18; 59) (fig. 5). Almonds have also been found at Kommos (Shay and Shay 1995: Table 4.11), Mochlos (Sarpaki and Bending 2004: 127-128), Palaikastro (Sarpaki 1989: 436), and Chamalevri (Sarpaki 1999: 41). More figs occurred in an LM IIIb farmhouse context at Sternes Akrotiri (Tzedakis and Martlew 1999: 99), in the Unexplored Mansion at Knossos (Jones 1984: Table), Mochlos (Sarpaki and Bending 2004: 126-128), Archanes (Sakellarakis and Sapouna-Sakellaraki 1997: 134) and at Myrtos Pyrgos (Cadogan 1977-78: 77). Pear and pistachio are two further species recognised at Chamalevri (Sarpaki 1999: 41). Platon suggested that some of the botanical remains from the

[5] See Hamilakis 1996: 7 for a word of warning about the reliability of this olive stone as Minoan evidence.

well off room XLI at Zakros were branches of aromatic shrubs or herbs (Platon 1985: 196), but this has not been discussed elsewhere, nor was any further information given, so it is hard to be certain about this. Similarly doubtful is the suggestion that a ceramic firebox from Mallia contained remains of coriander, juniper and a fennel species (Chapouthier 1941: 11). The problem is not with the species of plants mentioned; indeed they are a perfectly reasonable selection to have been used as a kind of incense. Rather, as Georgiou points out, it is impossible to find any further information on this vessel to verify the statement (Georgiou 1980).

Impressions on clay are another source of information on plants in the Bronze Age. If pots are left sitting on leaves to dry before being fired, the impression left in the clay can often be assigned to a species of plant. This is perhaps why a vessel from Myrtos Fournou Korifi has vine leaves impressed on its base (McGovern 2003: 251) (fig. 6). Impressions also can be found in clay which had structural uses, for example part of a roof or wall. Evidence for such use of reeds has been found in impressions from Vasiliki, Gournia, Nirou Khani and Palaikastro (Shaw 1973: 221). Furthermore, grains trapped within pottery also can be identified (J. Renfrew 1973: 15). Barley and wheat impressions were distinguished on some mud plaster from Myrtos (J. Renfrew 1972: 316) (fig. 7), as well as possibly reeds (*Phragmites* sp.) and *Quercus ilex* (Rackham 1972: 304). Reeds were also perhaps identified at Debla, where impressions of wheat, barley, oats, and the weed brome occurred (Greig 1974: 341). An olive leaf impression from Chrysokamino adds to the data (Betancourt *et al.* 1999: 354), and a grape pip impression was noticed in a MM II/III cup from Knossos (J. Renfrew 1996: 264). Other Knossos impressions include olive in a LM Ib cup, hulled barley in a MM cup, emmer wheat on a MM conical cup and *Pistacia terebinthus* on an MM II saucer (Åström and Hjelmqvist 1971: 9). Finally, an impression of seaweed has been recorded at Palaikastro (Shaw 1973: 222; Dawkins 1903-1904: 205).

Charcoal analysis is yet another tool in the palaeobotanist's kitbag (Table 1.2). By its very nature, i.e. burnt wood, charcoal samples are likely to come from hearths, or as remnants of timber furniture or structural supports destroyed in conflagrations. Rackham identified olive, oak and pine charcoal at Myrtos, which he believed to be mainly from roof timbers (Rackham 1972: 303). Schoch, at Pseira, also found evidence of these three woods, which he suggested were mainly from cooking fires in building AD, and were burnt as fuel on the altar of building AC (Schoch 1995: 133-134; Schoch 1998a: 40). These woods were accompanied by traces of terebinth, almond, palm, and a pomaceous fruit (Schoch

1995). Juniper, tamarisk and arbutus were also recognised in the Plateia building (Schoch 1998b). The charcoal analysis at Kommos has produced more additions to the above woody plants: cypress, maple, lentisc, heather, oleander, carob, spiny broom, plane, buckthorn, pear/hawthorn/apple, willow/poplar, and Thymelaea (Shay and Shay 1995: Table 4.9). Work at the LM Ib Artisans' Quarter at Mochlos has also produced a variety of charcoal remains, including many of those listed above as well further species such as cistus (Schoch and Ntinou 2004: Table 39). Less comprehensive charcoal finds have come from Knossos, Phaistos and Palaikastro also. There is nothing particularly unusual to be found in these species, which are a mixture of edible crops and trees with other uses; all are still seen as part of the Cretan landscape today.

It is obvious therefore that cultivable crops make up the large majority of finds, with the Mediterranean triad and pulses topping the list. Fruits which can be gathered from the wild feature also, as would be expected. More recent analyses certainly show that where time and techniques are available, a wider range of species can be identified, for example at Kommos, Mochlos and Pseira. Archaeologists are always hampered by the uneven survival of the remains they recover. Plant products which could have been stored for a period of time will always be more likely to survive palaeobotanically than those consumed fresh (Sarpaki 2000a: 118). It will be noted from the information above that no remains of roots or tubers were identified; not only do these require desiccation or waterlogging to survive, but due to their use pattern, often only skin or peel remains behind (Pearsall 2000: 154). An exception was found at Akrotiri however, in Delta 2, or the room of the lily fresco. From here Marinatos recovered a membraneous substance, which he suggested to be onion skin, and took casts which he thought to perhaps be "tender green onions" (Thera IV: 43; pl.108). A bulb of a flower such as a lily could also fit the evidence, and indeed, would perhaps underline the importance of this flower, both depicted on the walls and apparently growing within the same room. No remains of petals or other delicate parts of flowers and plants have been found at Aegean sites. An impression of an unidentifiable broadleaf plant came from Debla (Greig 1974: 341), and charcoal of another unidentifiable broadleaf was reported at Pseira (Schoch 1995: 134). This highlights another problem when dealing with softer tissue plants - if they do survive at all, they are often not distinguishable to a species level.

Nevertheless, one of the most intriguing finds must be the oil of iris identified from chemical residues in three ceramic vessels from Bolanis, Chamalevri (Tzedakis and Martlew 1999: 44). Here is evidence of a people-plant interaction

which is not only for food, but moves into other spheres, perhaps ritual, perhaps medicinal, perhaps economic, as well as pure bodily pleasure. Chemical analysis of vessels from Monastiraki and Apodoulou has shown that resin, perhaps either pine or terebinth, may have been added to wine, hence suggesting an early example of retsina (McGovern 2003: 260-262), although the substance may also have been used to seal the vessels. In the future, hopefully chemical analyses will be performed not only on vessels, but on soils and find contexts to search for traces of the plants that have so far eluded any other proof of their use.

Summary

In examining the palaeobotanical remains from Crete, it becomes obvious that the majority tend to be agricultural staples, such as cereals, pulses, olives, grapes, and other fruits and nuts. One factor influencing this is obviously the differential preservation rates of botanic remains. However, as scientific techniques become ever more precise, it is hoped that traces of more elusive plants will become standard rather than exceptional. Furthermore, peripheral areas such as dumps, kitchens and field houses should be palaeobotanically sampled as eagerly as public areas, as it is from such places that remains of plants at different stages in their use-life will be discovered (Vaughan 2000: 5). It is also worth mentioning that the majority of macroscopic plant remains from Greece come from two periods, the Late Neolithic and the Late Bronze Age, with the Early and Middle Bronze Age less well-represented (Hansen 1994: 178 and Fig. 9.1). In the Aegean, research which has drawn on palaeobotanical evidence has been mostly of an economic/agricultural leaning. Although recent theoretical developments in archaeology have seen a move from functionalist economic modelling to cognitive interests, this has not always been mirrored in palaeobotanical research. There is no doubt that the traditional questions and methodologies are valuable, but they must be developed into ones which realise that the consumption of all plants has social meaning, whether it is eating, drinking, or smoking them; using them for medicinal or healthcare purposes; decorating bodies or artefacts; or building things with them. People have always been surrounded by different types of plants in all aspects of their lives, and it is time that this was acknowledged for the Aegean Bronze Age.

1.2 Palynology in Greece

It is important to add a short section here about palynological research in Greece, as this is a further sphere through which researchers try to understand human-plant interaction. Pollen grains are produced in varying amounts, shapes, and sizes by the male reproductive organs of all spermatophyte plants. Palynology, or

the study of pollen, can therefore be a useful tool in reconstructing past vegetation cover, but its use must always be accompanied by an awareness of the method's shortcomings. Much pollen is only identifiable to genus level (e.g. *Quercus* or oak), so may not provide a meaningful level of specificity. Furthermore, there will always be a preponderance of wind-pollinated plants in any sample (Dincauze 2000: 345). Any deposit of pollen will usually be a combination of local pollen from contemporary vegetation, regional pollen brought there via wind, water or soil erosion, and residual pollen accumulated over time (Evans and O'Connor 1999: 71). For this reason palynology is generally used to look at vegetation on a regional level rather than providing site-specific information. It is also used in discussions of past climatic conditions.

Greece

Palynology's use is always limited by unsuitable conditions; polleniferous sediments are those which maintain an anaerobic state, such as is found in swamps, bogs and perennial lakes (Bottema 1999: 14). This does not make Greece an especially happy hunting ground for palynologists. The majority of pollen cores from Greece have been taken from the damper northern regions of the country, such as Lake Ioannina, Kastoria, and Tenagi Philippon, the last of these being the first published core from Greece.[6] Much of the information provided by these cores relates to the Pleistocene era (especially the Upper and Middle Palaeolithic, or 125,000 BP to 10,000 BP), and so is of little interest to archaeologists wishing to explore the human-plant interaction which becomes more pronounced in the Holocene (i.e. from the Neolithic onwards).[7] However, the excavations, and especially the regional surveys discussed above have tried, where possible, to incorporate palynological work into their results. The Minnesota Messenia expedition was fortunate in having Osmanaga Lagoon within their survey area, and pollen cores were successfully taken from it. This work was carried on more recently by the Pylos Regional Archaeological Project (PRAP), which made pollen samples from the lagoon a key part of their attempts to determine the vegetation history of the area (Zangger *et al.* 1997). The Argolid survey was able to use pollen from within Franchthi cave and cores from Kiladha Bay to help them identify the past vegetation in their region (Jameson *et al.* 1994). Other projects have not been so lucky - for example, there are no pollen cores that the Laconia survey can make use of (Cavanagh *et al.* 2002: 111), and while the Methana survey has used data from nearby sites of Lerna and Nemea (Mee and Forbes 1997: 24), this practice can lead to misleading vegetation information.

[6] See Bintliff 1977 for a summary of the findings of some of these cores; Gerasimidis 2000 has a map plotting all pollen cores for Greece.

[7] See Hansen 1994 for a synopsis of the epochs covered by each Greek pollen core and the plants identified therein.

Crete

Palynological studies on Crete are limited in number, again due to the unsuitability of many sites for coring. Recently a study has been carried out at Asi Gonia, a peat bog in the White Mountains, but the results only date back to Early Byzantine times and so are of little use to Minoan archaeologists (Atherden 2000). The core from Aghia Galini, in the south of the island, does not extend beyond c.5000 BP, again thwarting Minoanists looking for complete Bronze Age vegetation information (Bottema 1994: 57). As part of her Khania regional survey, Moody conducted six trial pollen cores, of which two contained pollen from Neolithic and Bronze Age sediments (Moody 1987: 65). In fact, the Tersana core from the Akrotiri peninsula, was, until recently, the only one from Crete to have pollen from the Middle to Late Minoan period (Moody 2000: 58). These Tersana and Limnes cores are discussed in some depth in Moody's thesis, where one of her conclusions is that by the late Neolithic there was a substantial decline in tree pollen, suggesting human action such as land clearance for cultivation (Moody 1987: 92). An attempt to reconstruct the landscape of Neolithic and Bronze Age north-western Crete also uses material from these cores (Moody, Rackham and Rapp 1996). Recent palynological investigations from the region of Lake Kournas in western central Crete provide the longest continuous vegetation record on the island (fig. 8). Tracing the changes in tree types, the authors note an increase in human activity from about 6000 BP and conclude that no major climatic changes affected northwestern Crete during the Holocene (Bottema and Sarpaki 2003). They also look for evidence of the effect of the Thera eruption on the vegetation, but such changes as they found seemed to have anthropogenic causes rather than directly volcanic ones.

Conclusions

Information such as that gained from the Kournas core is typical of the results from pollen analysis - a history of local vegetation. Bottema states that palynological research should focus directly on the relation between the natural evolution of vegetation and human impact on plant regimes (Bottema 1994: 45). Not every type of human activity is detectable through pollen analysis however. Most common events include periods of deforestation and reafforestation, times of increased pastoral activity, periods of cultivation, and periods when fields were not cultivated (Andrieu *et al.* 1999: 22). The introduction of new species can obviously be recognised too. Furthermore, Moody has recently combined evidence from medieval written records with pollen cores to suggest that Crete experienced a Little Ice Age; using similarities between the medieval Asi Gonia core and the Minoan Tersana pollen, she has then extrapolated that in the Middle

to Late Bronze Age, similar climatic upheavals may have occurred on the island (Moody 2000: 58). This type of cross-disciplinary work, linking palynological information with other sources, must be one way of furthering information about the Bronze Age environment, and hopefully will be continued in the future.

1.3 Environmental Material in Archaeological Survey in Greece

This section examines the information available about the environment, past and present, from archaeological surveys. Such practices are another way to elucidate information about people-plant interaction in the Bronze Age. The development and inexorable rise of survey as a valued tool is introduced, and examples from Greece, and specifically Crete, are more closely considered. To analyse in depth the results of every survey, even if just limited to those carried out in Crete, is beyond the scope of this work. This summary instead identifies the key themes within environmental survey work on Greece, and especially Crete. The types of environmental information deemed important are presented, and any changes in this over time are discussed.

Field survey: a brief introduction

Although it is only since the 1970s that survey has played a key role in Greek archaeology, it was a method used in other parts of the world earlier in the twentieth century. Large-scale surveys were carried out in the Near East and the Americas, as interest grew in the settlement pattern of regions (Renfrew and Bahn 1996: 70). Indeed, the Messenia survey explicitly acknowledges its debt to the Teotihuacán Valley Project and the Diyala Basin Archaeological Project (Macdonald and Rapp 1972: 14). This rise in popularity of field survey in the last thirty years has been accompanied by a myriad of articles on the pros and cons of this relatively new method.[8]

Excavation has traditionally been the archaeologist's ultimate tool, and perhaps even now is thought superior to survey by many. In reality the two methods complement each other, one providing a lot of information about a small area, and the other providing less detailed information about a larger area. Survey tends to be diachronic, whereas excavation often favours a particular period. Survey has developed from simple fieldwalking to systematic sampling strategies; from being a preliminary to excavation to being a project in itself; from focusing on finding new archaeological sites to being a multidisciplinary study of a region, including practices such as ethnography, geology, pedology, and, of course, botanical research.

[8] For early discussions see Plog, Plog and Wait 1978, and Ammerman 1981.

Early explorations and peregrinations in Crete

A few words must be written about the various explorations of Greece before the rise of systematic archaeological survey. Often the ancient sources are consulted for information about the landscape in classical Greece. Rackham notes however that, while some parts of Greece are well covered in such texts, Crete does not receive much attention (Rackham 1996: 22). This problem is further compounded by the proliferation of unfounded tales about the island, e.g. Theophrastus reports the existence of a black poplar at the Idaean cave (*Hist. pl.* 3.3.4), a botanical impossibility. Such sources therefore cannot be relied upon for consistently correct information about Crete (Rackham 1996: 35). In Hellenistic and Roman times the island was famed for its medicinal herbs (Rackham and Moody 1996: 130), but that is the sum of the information available. If the ancients are thus dismissed, it is to more recent writers that the historical ecologist must turn.

A crucial distinction needs to be made between exploration and survey (Wagstaff 2000). Exploration was what the pre-twentieth century travellers to Greece did, visiting sites, noting local customs, discussing history and myths, and incorporating in their work occasional comments on the local environment. Travellers prior to the nineteenth century were neither so numerous, nor so erudite as those who followed in their footsteps. Yet all these early expeditions, often recorded in diaries which were later published, are a valuable source of information on the Greek environment at different stages throughout the last five hundred years, and provide a pleasant contrast to modern surveys arranged by "project-orientated researchers with their more formal methods of collecting and synthesising information" (Wagstaff 2000: 69).

Regarding Crete, official records exist from both the Venetian and Turkish periods (Venetian 1210-1650; Turkish 1650-1898), some of which include details of a botanical nature, although these tend to be about plants which had some trade value, or were key agricultural crops in a region.[9] Rackham makes a valid point in relation to the limited written records about maquis and garrigue plants; namely that, as these were mainly used for fuel and fodder, they did not count as plants which had a monetary value, and so were not recorded in an official capacity (Rackham 2002: 104). Venetian travellers such as Buondelmonti and Gerola also wrote of their journeys, but made little comment on the vegetation. Before the mid-sixteenth century, many visitors from Western Europe to the island were actually pilgrims, en route to the Holy Land; after this time, the faithful were replaced by those of a scientific or antiquarian leaning (Warren 2000a: 1). Some concentrated exclusively on the island's natural history - Raulin's 1869 opus, for

[9] Turkish records are not easily accessible and could not be consulted for this work.

example. Others, such as *Flora Graeca Sibthorpiana* (1806-1840) included Cretan flora in their works on Greek and Balkan botany (Warren 2000a: 7). This type of plant hunting and classification was part and parcel of nineteenth century scientific development, which had seen botany become a flourishing discipline.[10]

Other travellers included descriptions of noteworthy things about the landscape or flora that struck them on their journeys across the island. Charles Edwards's *Letters from Crete* is full of wonderfully flowery prose, and not just on botanical subjects, and the quote which opened this chapter gives some idea of the type of writing popular at this time. Such effusive descriptions would probably not be welcomed in a modern archaeological publication, although a surprising amount of information is actually conveyed. Similarly with two of the more well-known travellers around Crete, Pashley and Spratt, it is again possible to extract nuggets of information about the island's vegetation. Even Pashley's frequent comments on the dinners he received from Cretans provides ethnobotanical information, e.g. delicious salads of wild asparagus (Pashley 1837, II: 45), while Spratt usefully differentiates between vegetation zones on Mt. Ida (Spratt 1865: 20-21) (fig. 9). Trevor-Battye's turn-of-the-century camping trip around the island allowed him to include snippets of information on the flora he encountered, and he added a list of where various plants grow, describing them and sometimes elaborating on their uses (Trevor-Battye 1913: 274-279).

It is a welcome development in the study of the island's vegetation that these non-archaeological travellers' records are once again being consulted for the data contained within. For example, Oliver Rackham's contribution on the "historical ecology" of the Laconia survey includes references to medieval records and later travellers' writings (Rackham 2002: 102-111). Any comments they may have made on environmental matters can be compared and contrasted to the area today, and so can help in studying the long-term changes the landscape undergoes. Warren also refers to such older records in his study of Cretan diet over time (Warren 2003).

Archaeological survey and the environment in Greece

It is easy to be lulled into believing that archaeology on Crete is dominated by the excavation of Minoan palaces and villas. However, despite being the largest of the Greek islands, Crete has also been relatively well surveyed, a fact often obscured by reports of more 'glamorous' finds. One of the seminal works on archaeological survey in the Mediterranean mapped out prior surveys carried out on Crete (Keller and Rupp 1983: map 3). Thirteen are listed, and in the intervening twenty-

[10] See chapter three for a summary of the rise of botany as a scientific discipline.

three years since this publication, many additional areas have been carefully walked by archaeologists (fig. 10). To these original thirteen, of varying intensity, (East Crete, Kavousi, Central East Crete, Lasithi, Arkhanes, Knossos area, Kommos, Mesara plain, Khania, Western Mesara, Ayios Vasilios,[11] West Crete and Ayiofarango) can be added others from the 1990s such as Vrokastro, Gournia, Sphakia, Praisos, Ziros, and Itanos. In fact, up to thirty survey projects in Greece have been reported in *AR* for some years in the 1990's (Alcock and Cherry 2004: fig. 1.2). A recent paper estimates that 1100 square kilometres of the island have been surveyed so far, although less than half of this is actually published (Cunningham and Driessen 2004: 102). Driessen has also pointed out that most of these surveys relate to land below 800 m.a.s.l. (Driessen 2001: 53), which although perhaps sensible when searching for settlements, means that much of the different types of vegetation found at higher altitudes are not examined as carefully as the familiar maquis, garrigue, and steppe.

Many have followed in the footsteps of the early explorers introduced above, perhaps most famously Sir Arthur Evans, and later in the twentieth century, J.D.S. Pendlebury. The wanderings of these two giants of Cretan archaeology led to the recognition of many new sites across the island, but neither of them made a specific point of carefully recording many environmental details. Evans was reputed to be fond of flowers (Brown 2001: vii) and his diaries are interspersed with the odd keen (and eloquent) observation on the local flora. For example, on March 30th 1894, he recorded the following:

> "From Kamares descended by an exquisite gorge with oleander thickets growing along the side of a raging stream - magnificent olives of hoar antiquity starting up among the rocks - and such an array of anemones from white to scarlet, and every shade of blue and purple-pink and rose madder." (Brown 2001: 27)

On the other hand, Pendlebury does not see fit to record the vegetation he encountered on his travels, although he does ponder the issue of deforestation (Pendlebury 1939: 6).[12] This idea that in the distant past Crete was far more heavily wooded than today, and that human folly has led to a Ruined Landscape has been persistent, yet has little actual basis in fact (Rackham and Moody 1996: 9-10). In the 1960s, Sinclair Hood and various companions bridge the gap between the early explorers and the systematic survey of the late twentieth century. Hood carried out several informal surveys of different areas of Crete, published in the BSA in 1964-1967. These expeditions were carried out to update knowledge of sites in the

[11] Not to be confused with the Ayios Vasilios Valley project of the 1990s, directed by Peatfield, Moody and Markoulaki.

[12] Although see section 1.4 for Pendlebury and collaborators' environmental notes on projects in the Lasithi.

chosen areas, although unlike later surveys, there is no consideration of what actually constitutes a site nor any mention of environmental features.

By the 1970s however, the new wave of survey arrived in the Aegean. Snodgrass wrote that survey in Greece developed to fill the gaps in understanding the rural territory of the Greek city (Snodgrass 1990: 118), but it must not be forgotten that the theoretical impetus for much survey work sprang from New Archaeology's idea that research must involve studying the regions around sites (Alcock *et al.* 1994: 137). The first publication of an extensive field survey in Greece was that of the University of Minnesota Messenia Expedition (UMME). The authors explain their aim in the introductory remarks as researching "the interaction among humans, other biota, and the physical environment", with particular emphasis on the late Bronze Age of south-west Greece (MacDonald and Rapp 1972: 6). Environmental issues form a core part of the publication, and include coverage of landscape, climate, geology and routeways, as well as pollen from Osmanaga Lagoon. Ethnographic work led to a calendar of crop activity, which can form a basis for thinking about such activities during the Bronze Age. They also used contemporary agricultural practices to shed light on the ancient economy and make inferences about land-use systems and subsistence in the late Bronze Age in Messenia (MacDonald and Rapp 1972: 177-187). All these topics are fully integrated into the publication rather than included as an appendix, indicating how such issues were starting to be seen as equally important as ceramic analysis and other more traditional archaeological techniques.

Such survey work importantly moved the focus away from urban settlement to the surrounding areas, and the effect the environment and its exploitation can have on a society, as well human impact on the land. However, a common theme which runs through archaeological literature for the next twenty-five years is the concentration on 'crops', rather than the broader 'vegetation'. Studies tend to report evidence for wheat, barley, oats, figs, olives, grapes, flax, cotton, and fruit trees, basically mirroring the type of plants focused on in palaeobotanical studies. Non-domesticated plants rarely get discussed. Of course, this bias is largely caused by the research questions set by archaeologists, who in the 1970s were very much interested in subsistence, carrying-capacity, land yields and other scientifically deductible information.

Several other large Greek survey projects grew out of the 1970s, that of Melos, Keos, and the Argolid. The Melos project takes an extremely processual, scientific way of carrying out its research, where the focus is on human exploitation of a

given area, in this case a Cycladic island (Renfrew and Wagstaff 1982). Although words like "interrelationships" and "interdependence" are used, the Melos survey really only examines one-way traffic, or how man exploits nature. Land use and agriculture are studied, but there is no consideration of the influence of plants on man's economic, cultural and political history. An ethnoarchaeological study of recent rural land-use in Keos, with discussion of major crops (cereals, vegetables, vines, tree crops, and velanidi acorns), is more wide-ranging in its questions and results, although non-cultivated vegetation in the present and past is ignored in the publication (Cherry *et al.* 1991). The Argolid survey considers vegetation in much greater depth than Messenia, Melos or Keos, and its methodology reflects the passage of time since the earliest surveys in Greece. One of the aims of this survey project is explained thus:

> "The coevolution of environment and human settlement is one of the main themes of this book. This theme comprises the available environmental possibilities, the resources that were available, the decisions made at various times and places, as well as the reasons for such decisions. It also covers the process of learning to intensify the use of the land through hunting, gathering, fishing, herding, farming, mining and trade. Above all, it places the emphasis upon the interactive process of change, the mutual feedback that exists in the relations between the natural environment and the human beings who must adapt themselves to that environment, and in the end change it, and with it themselves." (Jameson *et al.* 1994: 325)

This survey is particularly fortunate from a palaeobotanical aspect also, as the important site of Franchthi Cave is located within the study region. Pollen analysis has been carried out both within the cave, as well as using cores from off the coast. This data, combined with macroscopic remains from inside the cave, provides information on the human use of plants from around 11,000 years ago.[13] Of particular interest has been the discovery of remains of wild caper and coriander here, plants not usually considered as part of the 'package' of prehistoric cultivation. In fact, compared to the Melos survey, the Argolid project views humans as less like biological machines, exploiting the land, and more as interacting with it, learning both how to use it and how to nurture it.

Importantly, survey in Crete had been developing too. The first attempt to bring this new method to the island was the Ayiofarango Valley project (Blackman and Branigan 1975: 1977). While notable for its role at the forefront of Cretan survey, there is not one mention of the vegetation in the area, an astonishing fact to

[13] Palaeobotanical remains from Franchthi have been studied in depth by Hansen 1991.

anyone who has ever walked in the Ayiofarango valley or its surrounds. Other early surveys also do not seem to see vegetation as important, such as the Roussolakos area project (MacGillivray and Sackett: 1984), and the study of Mesara plain by Ian Sanders (Sanders 1976). On the other hand, Watrous's study of ancient settlement in the Lasithi plateau does examine land use during different periods (Watrous 1982) (fig. 11). One of the earliest Cretan projects to devote any real time to vegetation study was the doctoral thesis of Jenny Moody, who surveyed the area around Khania, in the west of the island. She realised that so far there had been few attempts to reconstruct the ancient vegetation of Crete and relate it to the island's history (Moody 1987, I: 2). Moody looked at a variety of environmental data, including modern vegetation and pollen cores, as well as climate information. Her statement that "until the environmental history of a region is at least partially understood any reconstruction of its cultural history will be incomplete and possibly inaccurate" (Moody 1987, I: 1) was a wake-up call to surveys which had not been including such details thus far.

To remedy this relatively limited environmental knowledge was one of the aims of the 1990s survey of the Pylos area (PRAP). It was decided to re-survey a portion of the area covered by UMME at a more intensive level (Davis *et al.* 1997). Part two of this publication attempts to determine past vegetation and land-use, or as the authors put it "develop a multifaceted reconstruction of the environmental history by examining pollen, foraminifera, molluscs, and a number of physical properties of the cored sediments, including organic matter, carbon, nitrogen, C/N ration, and stable isotopes" (Zangger *et al.* 1997: 576). The modern vegetation was also surveyed. The pollen records from this project are exceptional, with the presence of many different species being tested, rather than just trees and crops, as often seems to be the case. In fact, PRAP ends up with a record of the vegetation history of the area from 5000 B.C. to the present day, and perhaps the most comprehensive piece of environmental surveying so far published.

Moving into the 1990s in Crete, it seems that project designers were aiming for similar information levels. The survey of the Sphakia region investigated human interaction with the landscape, and blazed a trail by publishing its results on the World Wide Web, prior to the final printed publication (Nixon *et al.* 2000).[14] Another survey from Crete, and contemporary with the Sphakia work, is the Vrokastro Survey Project. Again, the idea that the integration of environmental and archaeological landscapes is important for understanding settlement history is

[14] Some surveys from mainland Greece are also accessible via the Internet; see Gates, Alcock and Cherry 2004 for a list of addresses.

stressed (Hayden *et al.* 1992: 300). This is not surprising considering that both Oliver Rackham and Jenny Moody were involved in this project too. As with Sphakia, the region was divided into "Ecozones", and modern vegetation was studied, as well as the impact of practices like burning, browsing, woodcutting and cultivation on the land (Hayden 2004: 5-13). A CD-ROM accompanying the 2004 publication includes a study of an agricultural year in the area, but little attempt is made throughout the work to consider plants as more than food products.

In keeping with the aims of more recent surveys, the Western Mesara Project wished to investigate the interaction of humans with the environment over time and see how this affected settlement development in the region (Watrous *et al.* 1993: 191) (fig. 12). A key component of the survey was the botanical work coordinated by J. and C.T. Shay. This is perhaps the most inclusive work on vegetation yet carried out on an archaeological survey. They studied contemporary local flora, noting plant communities' relation to their environment, and assembled data on present-day ethnobotany and human influence on the landscape, in the hope of reconstructing the human-plant relations in the Mesara over time (Shay and Shay 2004). A transect was walked from the coast to the foothills of Ida, allowing them to study the total range of vegetation in the area, rather than just at targeted sites. The Shays' work here stands out from much of the other surveys due to their consideration of the many roles plants play in human life, rather than just as 'crops'; beverage, food, fodder, fuel, construction, decoration, crafts, medicine, poison, spices, and even ritual are all mentioned. The fact that one plant can play many roles is also appreciated; for example, *Pistacia lentiscus* is used as food, beverage, ritual, fuel, craft, medicine, and fodder (Shay and Shay 2004: Table B.9). This ethnobotanical approach had been pioneered during their work at Kommos and its hinterland, where they pointed out that "a person can hardly take a step into the countryside around Kommos without encountering a useful plant" (Shay and Shay 1995: 108).[15] It is this realisation which makes their work so interesting as well as full of valuable information, and which will hopefully become the model for future plant studies in the Aegean. One other publication must also be mentioned here, although, strictly speaking, it is not an archaeological survey. Rackham and Moody's 1996 *The Making of the Cretan Landscape* presents a fascinating mixture of information about the island's varied landscapes, plants, animals and human inhabitants. They pull together much of the work done in disparate surveys and studies to offer the reader an accessible volume on the Cretan environment, both present and past. Although ten years have passed since its publication, their multi-disciplinary

[15] The Kommos project is considered in greater detail in chapter three, where it is compared with an ethnobotanical survey.

approach has not been surpassed.

Rackham's recent work in Laconia on the Greek mainland has also been pushing the boundaries of botanical knowledge gained through survey. One of the stated aims of this project was to "illuminate the interplay between physical landscape, cultural circumstances and human society over a long span of Laconian history" (Cavanagh *et al.* 2002: 1). Rackham's *"Observations of the historical ecology of Laconia"* is a detailed piece of work, introducing the modern vegetation of the area, considering what classical authors had to say on the vegetation of Laconia, examining medieval records for the region, as well as looking at old photographs and illustrations. There are no suitable pollen cores from Laconia, so palynology was of little help on this particular project. One of Rackham's conclusions is that many of the changes between the 'aboriginal' landscape of Greece and the present-day one happened in a time prior to the third millennium BC. (Rackham 2002: 114). He adds that the key factors influencing modern vegetation are climate, browsing, woodcutting, burning and erosion and finishes by posing the question whether the apparent stability of the landscape during the last several thousand years is real or "an illusion caused by the lack of continuous record."(Rackham 2002: 118)

Despite the general rise in the importance of vegetation studies for surveys, culminating in the work on the Western Mesara project and Kommos, perhaps not every project has whole-heartedly embraced the ideology. The 1996 report on the survey at Kavousi (Crete) briefly mentions current crops growing in the area, but nothing else on vegetation (Haggis 1996). Similarly, the report on the Praisos study also succinctly mentions crops grown in the area, and describes the usual Cretan maquis-garrigue ground cover (Whitley *et al.* 1999). The report on the Ziros project (Crete) has no mention whatsoever of any environmental details (Branigan 1998). In their defence however, all three of these are preliminary reports, and it must be hoped that further vegetation details will emerge in later publications.

There are, of course, many other surveys from Greece which have not been mentioned here, but the sample discussed above allows the changing role of vegetation studies to be noted, and the accompanying development of research agendas to be made more explicit. Archaeologists seem now to realise that "the possibilities of each landscape will have interacted with the particular regional trajectory of human society in complex ways" (Barker and Bintliff 1999: 209). People-landscape interaction is no longer seen as simply an exploitative

relationship, but recognised for something far more complicated and meaningful.

1.4 A Century of Plants in the *Annual of the British School at Athens (BSA)*[16]

In order to see how the environment, and in particular that of Crete, has been treated over a long chronological span, a review was carried out in a major archaeological journal, the *Annual of the British School at Athens (BSA)*. Of course, not all papers published here relate to Crete or indeed the Bronze Age, but this journal is still a showcase for a significant proportion of the work that goes on within the Mediterranean region. Neither is it a specialised scientific journal, which means that palaeobotanical information is not incorporated as a matter of course but only when it is seen as an important part of archaeological studies. Examined decade by decade, this section shows how the study of the environment has developed over the course of the last hundred years. Table 1.3 lays out the information in a year-by-year breakdown of articles, summarised in Table 1.4 as a bar chart.

1900-1959

The first fifty-nine years of the century are gathered together here, as environmental information is sparse. The majority of archaeological reports published in the *BSA* in the first half of the twentieth century are about the discoveries at key sites in Greece. Knossos, Palaikastro, Sparta, Melos, Mycenae and Ithaca were all major British projects, and feature prominently in the journal. Vegetation studies do not play a part in these reports, despite the occasional foray into topographical description, often based on comparison between ancient sources and modern exploration. Gomme's 1911-1912 article does refer to agriculture in Boeotia, but he adds this almost as an afterthought, on the final page. During the 1930s, Pendlebury's Cretan work seems to have been the first to carefully record information on cultivated plants around the sites where his team was working, e.g.

> "Corn and potatoes are grown at the west end of the plain, olives on the broken ground to the east and vines on the lower slopes of the surrounding hills. Almond, apple and mulberry trees are not uncommon, but efforts at reafforestation have been confined to planting a quantity of ilex trees on the north side of the plain." (Pendlebury *et al.* 1935-1936: 8).

However, wild plants are not noted by any authors, and no attempt is made to consider the landscape in prehistory. Two World Wars naturally affected archaeology in Greece during the first half part of the twentieth century, and this

[16] Precise bibliographic details, such as page numbers, of the articles discussed in this section can be found on Table 1.3 rather than in the general bibliography.

is reflected in the smaller amount of fieldwork carried out during these crisis periods and slimmer publications. During the 1950s an increasing interest in artefacts, especially pottery, may be discerned from the articles being published, and topographical studies, mainly of geology and general terrain continue to appear also. In fact, in the whole first sixty years of the twentieth century, there is only one very short article entirely dedicated to plants: P.H.Davies (1937-1938) *The flowers of the Lasithi.*

1960-1969

Based on the work published in the *BSA* in the 1960s, the conclusion is reached that environmental studies were not, as yet, seen as a necessary part of archaeological research. There is not one article in the entire decade which treats of environmental matters, whether as part of a site report, or as a separate study on specific issues. For example, in 1965, there were six articles on various aspects of Cretan archaeology ranging from stone vases to LM III pottery to excavations at Palaikastro. This is a typical sample of the issues covered throughout the decade, focusing on archaeological sites and the analysis of artefacts, and applies not just to work on Crete but to archaeology around the Mediterranean. Where archaeological survey was carried out, such as on Euboea (Sackett *et al.* 1966), there is no mention of palaeobotanical research. Similarly, there is no such work accompanying the excavation reports from Palaikastro, for example.

1970-1979

This trend carries on in the early years of the following decade, with 1970-1973 also bare of botanical reports. 1975, 1976 and 1978 are equally empty. However, in 1974, there is a report by Warren and Tzedhakis on the site of Debla, which includes, for the first time in this journal, a brief description of the modern terrain and vegetation with a few thoughts on what it was possibly like in the Early Minoan period. Interestingly, one of the co-authors, Peter Warren, has since become known as an authority on plants in Crete. His work at Myrtos, roughly contemporary with the Debla project, also included botanical research although it was published elsewhere (Warren 1972). Regarding Debla, the authors consider "evidence for agricultural and economic exploitation of the region" (Warren and Tzedhakis 1974: 335). Archaeological remains such as bones, grain impressions, and grinding stones are cited to help understand the subsistence of the inhabitants of Debla. In a two-page appendix by Greig, the plant impressions left on ceramics are identified further: wheat, barley, oats, and brome (a weed plant), possibly reeds, and leaves. Nothing further is attempted with the material, and although it is a step in realising the potential of palaeobotanical remains, such a focus on farming economy and subsistence is to remain the norm for the next twenty

years.

The Ayiofarango survey of Branigan and Blackman is first presented in the *BSA* in the 1970s. As mentioned above, they do not describe vegetation in the initial 1975 report, although the follow-up report in 1977 includes a ten-page section entitled *The physical environment*. This focuses on geology, water resources, and the contemporary geomorphological debate about Older and Newer Fill, and generally ignores botanical matters. A few suggestions about farming are included in the piece, but other plants are ignored and "the total landscape is evaluated in terms of the potential for food production." (Branigan and Blackman 1977: 27). Calculations which deal with typical New Archaeology questions about the carrying capacity of the land follow.

In 1979, the *BSA* published *The location and environment of Knossos* by Neil Roberts. As Knossos has long been the centre of British studies of Minoan Crete, this would seem a timely attempt to locate the site within its surroundings, and maybe draw attention away from the architecture and artifacts which had so entranced people in the first half of the century. Roberts used a mixture of studies of topography, drainage, geology, soils and climate to achieve his aim of understanding "the long-term interaction between man and his environment at a single settlement site" (Roberts 1979: 231). Two pages are devoted to vegetation, where the author describes the natural vegetation of the whole island, according to altitudinal zones, as well as considering deforestation. Crucially, Roberts realised what is now evident in hindsight, that "important evidence for vegetation history comes from palynology and palaeobotany, though neither of these has yet been studied in any comprehensive way on Crete" (Roberts 1979: 234).

1980-1989

The 1980s saw a rise in the number of articles which have botanical aspects, although there are still years where nothing was published in this field (1981, 1984, 1985, 1986, 1988). The decade began with the report of the excavation at Assiros, in northern Greece. Although not on Crete, this is worth mentioning as there is an appendix on bio-archaeological remains (Wardle 1970: 265-267). Here the reader comes across techniques of flotation and microscope analysis making a first appearance in the *BSA*. Remains of wheat, barley, and lentils, as well as pips of grapes, figs and blackberries were identified from the site by Jones and Halstead, but there is no study of contemporary vegetation to complement the microscopic work.

In 1983, what could be termed a breakthrough occurred. Oliver Rackham's *Observations on the historical ecology of Boeotia* was published, a report on part of the Cambridge-Bradford expedition to Boeotia. As well as considering the usual geology, soils, and climate, Rackham looked at modern vegetation, and pioneered a whole new range of available data. The vegetation zones of maquis, garrigue and steppe are introduced, terms which over the years were to become synonymous with Greek and Cretan landscape. He also considers tree types, hedges, wetlands, seaside, mountains, modern cultivation, browsing and burning patterns, erosion, pollen analysis, and fuel-gathering, to furnish an all-round summary of the vegetation, past and present, of the survey area. Classical authors and later travellers' reports are also referred to. This synthesis of information from many different sources should have opened archaeologists' eyes to the possibilities of vegetation studies. Yet the 1989 Palaikastro report, while it does include preliminary environmental data by Sarpaki, with the results obtained from water sieving and flotation, continues to focus on the remains of cereals, pulses, legumes, olive, and almond, with no mention of the more general environment. This can perhaps be blamed on the narrow remit of traditional palaeobotanical studies, and Sarpaki would not have been expected to 'do a Rackham'. The era of using ethnography to inform on past methods of cultivation, processing and storing foodstuffs is ushered in by Glynis Jones's 1987 article on *Agricultural practice in Greek prehistory*. She calls for "intensive retrieval of plant remains on a large scale" (Jones 1987: 123), something which would become part and parcel of the excavation procedures of the 1990s.

1990-1999

During the 1990s Jones became one of the major contributors to the *BSA* on matters of a palaeobotanical importance. In 1990, she co-authored an article with Sarpaki on the cultivation of pulses, using examples from sites such as Knossos and Akrotiri. Jones produced another pulse-related piece in 1992, and that same year Sarpaki published *A palaeoethnobotanical study of the West House, Akrotiri, Thera*. This is the first detailed report of the botanical finds from this important Aegean site, apart from the brief mentions in S. Marinatos's excavation reports. It focuses on the crops found there (lentils, wheat, barley, peas, legumes, various weeds and coriander), especially material found in ceramic vessels, and so identifies probable locations for processing and storage. It is also interesting to see the term "palaeoethnobotanical" in use here, as opposed to merely "palaeobotanical", implying Sarpaki has an interest in the interaction between people and plants. In 1993, two articles by Jones and Paul Halstead appear, and Jones then authored two further pieces, in 1995, and 1999 (with four co-authors),

all focusing on palaeobotanical remains such as charred grain, pulses and weed floras.

In 1995, Halstead mixed his palaeobotanical work with a study of Linear B ideograms, to discuss Late Bronze Age grain crops. He points out that despite palaeobotanical identification of numerous cereal and pulse crops from Bronze Age sites, there is not a matching number of ideograms in Linear B. He makes a very important point: "it would be dangerous to assume that Late Bronze Age classification followed the practice of present-day archaeobotanists in grouping emmer, spelt, and einkorn as glume wheats" (Halstead 1995: 233). This is a rare realisation among archaeologists that Minoan organisation of the natural world need not resemble that of the modern one. Foxhall's *Bronze to iron: agricultural systems and political structures in the late Bronze Age and early Iron Age* is from the same year. The author commented that it is possible to make real progress on matters to do with prehistoric environments "because of the growing body of good quality data from excavation, the numerous regional surveys now operating in Greece, and the judicious addition of an ethnographic perspective" (Foxhall 1995: 239).

Summary

This brief survey has allowed the botanical trends in the *BSA* over the past century to be observed. While Minoan archaeology has always featured strongly in this publication, to look for palaeobotanical work before the 1970s is basically a fruitless task. This of course parallels the world-wide rise of 'laboratory archaeology' at this time, and so is not a surprise. What is more surprising is that throughout the 1970s, only three papers can be seen to have any palaeobotanical information at all. In the 1980's the situation improves marginally, and two papers dedicated solely to environmental matters appear. During these twenty years, botanical information tended also to be relegated to an appendix as opposed to meriting a whole article in its own right. Rackham's historical ecology was very much a new departure, and his work is probably even today the benchmark by which other environmental projects should be judged. The 1990s saw an increase in papers on palaeobotanical matters, and it is not unusual for a whole article to focus on a specific plant, although this is always a crop, such as pulses or grain. Therefore the gradual increase in the last thirty years shows that, while slow to seize upon palaeobotany as being useful, it now has become an accepted tool in Bronze Age Greek archaeology. As was noted earlier in this chapter however, plant material is primarily applied to economic questions, and indeed the papers published in the journal in the early years of the new millennium maintain this

focus; it must be hoped new avenues will be explored in the near future.

1.5 Final Comments

A number of points which are essential for understanding the current state of scholarship on Minoan plant remains have been illustrated in the course of this chapter. Firstly, that palaeobotanical research did not flourish in Greece until the 1980s. In contrast, some countries have a long history of palaeobotanical research, although this is helped by the existence of superior preservation conditions, e.g. dry conditions in Egypt (Woenig 1886). While the 1970s saw a general trend within archaeology for new scientific methodology to be introduced, palaeobotanical work in Greece seemed to lag behind. A possible suggestion for this is that the archaeology of ancient Greece often had strong ties with art historical and classical departments in universities. It took longer to accept that charred seeds were as valid a research topic as ceramics or architecture. And charred seeds, it appears, have made up by far the majority of palaeobotanical material to emerge from the Greek Bronze Age. Grains of various sorts, pulses, olive stones, grape pips and skins, some nuts and fruits, a few impressions in clay, charcoal of common trees, and scant pollen cores make up the total knowledge thus far, complemented by data on contemporary and recent vegetation from surveys and written sources. The most detailed analysis of botanical remains comes from the West House at Akrotiri, indicating that with careful study a wealth of information is available (Sarpaki 1992c). Future chemical analyses may lead to evidence of other, thus far invisible plants.

As well as changes in the types and amounts of material recovered, the questions asked of it have also changed over time. Originally, it was enough to present the data, such as simply stating that lentils and wheat were found at Mallia (Chapouthier and Charbonneaux 1928: 38). It was assumed that these plants indicated what was grown and eaten by Minoans, and there was no further information to be gleaned from such remains. Vickery pulled all the available evidence together in 1936, to present a picture of Neolithic and Bronze Age diet, and this remained the standard work using palaeobotanical remains until New Archaeology (Vickery 1936). With the rise in interest of problems to do with different spheres of society, such as economy or technology, fresh questions were put to the material, which now appeared as appendices in the main publications. Hansen summarises many of the issues which were at the heart of processual research into the Greek Bronze Age, and sets out new questions to be considered (Hansen 1988). These range from investigating any increase in crop diversity in certain periods, such as the addition of vines or olives, to whether there is greater

crop purity, which leads to production of surplus through intensification of land-use and specialisation (Hansen 1988: 41). There was also the obstacle of archaeologists and botanists having different goals, in the days before specialised archaeobotanists existed; archaeologists wanted to learn more about diet while botanists were keen to trace plant origins and the dispersal of cultigens (Dennell 1976: 229). Even material from surveys, recording present-day vegetation and delving into the more recent past, has rarely been put to much use beyond stating land-use, with the notable exception of work by Rackham and the Shays. Palynology has been applied to show changes in vegetation cover, some of which could be climate-related, some with anthropogenic causes. Of course, the identification of utilitarian plants remains of basic importance to archaeologists, as do investigations into diet and land use. Yet, the mainstream of archaeology has limited itself to seeing plant material's only possible contribution to an understanding of the Bronze Age as being in the sphere of agriculture and related economies.

It seems that there exists a self-perpetuating cycle of using certain palaeobotanical remains to answer certain questions, and asking certain questions which then lead to looking for specific types of palaeobotanical remains. Academics have been content to use the same few plants as the basis for all their theories. Now that scientific techniques are enabling traces of more elusive plants to be discovered, this new knowledge must lead to both new questions, and the widening of horizons when traditional issues are being debated. Indeed, Vaughan has recently called for more collaboration between the scientific community and the broader Aegean archaeological scene, to ensure future research lives up to its potential (Vaughan 2000: 5).

There are realisations that there is more to be done with the data than so far has been attempted:

> "Palaeoethnobotany is the analysis and interpretation of the direct interrelationships between humans and plants for whatever purposes, as manifested in the archaeological record. Its objective is the elucidation of cultural adaptation to the plant world and the impact of plants upon a prehistoric human population, not simply the recognition of useful plants." (Dincauze 2000: 392).

An elucidation of the vast array of purposes to which humans have put plants has never been realised through archaeology, yet surely it must be worth attempting this and trying to gain a more balanced picture of people-plant interaction in the Aegean Bronze Age. It is time to make the "ethno" in "palaeoethnobotany" as

important as the "botany". Archaeologists need to consider that plants may have multiple functions, an idea appreciated by ethnobotanists for years. It would be unfair to claim that no such thing has ever crossed an archaeologist's mind, and there are examples from some of the works discussed above where plants that are outside the traditional canon of cultivated crops are mentioned. These will be returned to in chapter three, where the question of the extent to which ethnobotany can be successfully practised on a prehistoric society is addressed.

Another interesting point arising out of this chapter is the discrepancy between those plants which are depicted on Minoan ceramics or frescoes and those which are retrieved (and retrievable) palaeobotanically. Crocuses, lilies, papyrus, and rock-rose are just a few which proliferate in art, but not archaeologically. It has never been suggested that such plants did not exist on Crete in Minoan times. Yet it seems that nobody has stopped to ask why these plants were important in Bronze Age life. A related question is why were the plants for which palaeobotanical evidence does exist not depicted in art with the same frequency? The iconography of traditional crop plants is considered in Appendix I. That plants can also be important on a symbolic level is a concept which was never considered by the palaeobotanists of the 1970s and 1980s. Plants can be experienced in a variety of ways, not just as calorie-providers; their smell, taste, texture, colour, and chemical properties all allow for different perceptions of them. This matter will be dealt with in detail in chapter six, but it is important to raise these questions here, as they are part of the future of botanical research in the Aegean Bronze Age.

Chapter 2: Imagined Plants in Aegean Iconography

> Since seven o'clock this morning I have been sitting in front of something which after all is no great matter, a ball-shaped bush of cedar or cypress, planted in the grass. You already know this ball-shaped bush, since you already have a study of the garden. Enclosed also a sketch of my canvas, again a square size 30. The bush is green, a little bronze and various other tints. The grass is very, very green, lemon-tinted emerald green. The sky is very, very blue. The row of bushes in the background are all oleanders, raving mad; the blasted plants flowering so riotously they could certainly catch locomotor ataxia. They are loaded with fresh flowers, and heaps of faded flowers as well, their greenery is likewise renewing itself in vigorous new shoots, apparently inexhaustibly. A funereal cypress, all black, is standing over them, and some colourful little figures walking on a pink path.
>
> This makes a pendant to another size 30 canvas of the same place, only from quite another point of view, where the whole garden is coloured in very different green, under a pale lemon-yellow sky. But isn't it true that this garden has a strange character which makes one easily imagine the poets of the Renaissance, Dante, Petrarch, Boccaccio, strolling among these bushes and over the flowering grass? Now it is true that I have left out some trees, but those I kept in the composition are really there just as you see it. Only it has been overcrowded by some bushes which are not in character. And this should find that truer and more fundamental character. This is the third time that I've painted the same place. It just happens to be the garden right in front of my house. But this corner of garden is a good example of what I was telling you, that to get at the real character of things here, it is necessary to study them and paint them for a very long time.
>
> (Letter from Vincent van Gogh to his brother, Theo. Arles, c.27 September 1888)

As the preceding quote vividly demonstrates, painting the colours and forms of the surrounding natural world is a desire that can dramatically seize artists. Whether their reasons were symbolic, religious, decorative, or, like van Gogh, an attempt to understand "the real character of things", Minoan painters were no exception, and during the century since their floral artefacts first were uncovered, have inspired much discussion. As a companion to chapter one, which concentrated on actual plant remains, this chapter turns to these imagined plants of the Bronze Age, and examines a number of the key iconographic issues which have been the focus of academic studies.

As with palaeobotany, the nature of iconographic analysis has changed over the years. Early excavators, unaccustomed to discovering such colourful frescoes and pottery, enthused over the finds, and attributed to the Minoans "the romantic spirit at its first entry into the world" (Forsdyke 1929: 8). Nor was such an attitude

limited to academia; newspaper articles enthused about "the capacity of these of these early Aegean artists to model with freshness and expression" (Anon: 1903). For much of the twentieth century, any mention of floral iconography was limited to its inclusion in a catalogue of finds from an excavation, or a general survey of a type of pottery, e.g. Popham's summary of Late Minoan ceramics includes vegetative motifs (Popham 1967). In the late 1960's, Mark Cameron became the authoritative voice on Minoan frescoes, especially those of Knossos (e.g. Cameron 1968), and in the course of his work considered floral motifs as a complete body of material (Cameron 1975: 97-104). In fact, iconographic studies in general increased during the 1970's but plant motifs did not receive much attention, perhaps because those plants most frequently depicted tended not to be the crops in which much of archaeology was interested at the time. The publication of the excavations at Akrotiri provided a new stimulus for iconographic work. The wealth of material recovered led to the "Thera and the Aegean World" congresses, the proceedings of which contain many valuable papers related to Theran art. Two articles, by Diapolis (1980) and Douskos (1980), can be seen as the first case-studies of individual plants (sea lilies and crocuses), and the authors linked together botanical evidence with iconography. More recent publications dealing with the wall paintings of Thera and Minoan Crete have seen an increase in articles focusing on plants, and it seems that their potential as bearers of meaning is slowly being realised (Sherratt ed. 2000; Morgan ed. 2005). Other collections such as EIKON and *L'iconographie minoenne* have also been important in establishing iconographic studies within Aegean archaeology (Laffineur and Crowley 1992; Darcque and Poursat 1983). Nonetheless, much work remains to be done on floral iconography, which would be immeasurably aided by the speedy publication of further comparative material.

2.1 Plant Identification in Minoan Art

Early identifications

Ever since Sir Arthur Evans first dug up pieces of pottery and frescoes displaying floral motifs, scholars have been playing at guessing the botanical identification of the plants concerned.[17] Evans confidently labelled the flowers "Pancratium lily" or "myrtle", for example, based on similar characteristics with the actual plant (PM II.2: 456-457). His interest in flowers would certainly have helped him with such an exercise (Brown 2001: vii). That this practice came naturally to him is not a surprise, as plant motifs which occurred in the art of other ancient societies around the Mediterranean were also seen as identifiable by their excavators. Egyptian art

[17] The words 'fresco' and wall-painting' are used interchangeably throughout, and are not intended to indicate the technique used in their creation. For more information on the technique of crafting of Minoan frescoes, see Immerwahr 1990: 11-19.

depicts plants in a stylised fashion, but they can still be plausibly identified, such as the papyrus, water lilies and date palms painted in the tomb of Nebamun at Thebes, for example (fig. 13). Art of the Near East also features many motifs from the floral realm, again usually identifiable as distinct species, such as the pine trees and grape vines from Ashurbanipal's palace at Ninevah (Albenda 1974) (fig. 14). With exploration in both of these regions in full swing at the time of Evans's work on Crete, he would have been aware of such botanical identification, and keen to provide names for the plants he was discovering in the art of his Minoans. One key difference that must be noted is that Evans had no texts to help him. The writing systems of ancient Egypt and the Near East had been interpreted, and translations of myths, spells, decrees and inscriptions all helped to indicate which plants were known, what their names were, and how they were used within these societies.[18] If the remains that Evans discovered were to be brought to light for the first time today, archaeologists perhaps would be more hesitant in identifying the plants, aware of the perils of foisting modern interpretations onto material culture of past societies. Once such a tradition of identification had been started however, other excavators followed suit, often copying Evans's names, and so the canon of identifiable plants in Aegean art was born.

It took an actual botanist to bring some form of structure to the mass of plants which were emerging. The ground-breaking work of Martin Möbius was the earliest attempt to classify all the different plants found in Minoan art (1933). He divided them into three categories: *Sicher bestimmbar, mit Wahrscheinlichkeit bestimmbar*, and *Unsichere*, or "certain identification", "probable identification" and "uncertain". From this, he then developed sub-categories based on plant morphology, such as shrubs or trees, leafy branches or single blossoms (Möbius 1933: 2). Interestingly, he was able to assign names to a large number of different plants. Certain identification was allocated to the white lily, sea lily, crocus, iris, rose, olive and fig tree, as well as the two species he saw as foreign to Crete, the date palm and papyrus (Mobius 1933: 2). His probable plants included caper, myrtle, violet, pomegranate, barley and lupin (Mobius 1933: 2) He remained uncertain about the tulip, water lily, honeysuckle, balm, gladiolus, plantain, grasses of different sorts, "sacral ivy", and hollyhock (Mobius 1933: 2). Recognising such a broad range of species does indicate a great diversity within the art, although in comparison to the huge numbers of plants actually growing in Crete, it is but a tiny sample. Archaeologists continue to use these same identifications for most of the floral motifs today, although some of those he

[18] Further assistance in identifying plants in ancient Egyptian writings comes from the medicinal work of Dioscorides, which had Egyptian plant names added to the text in the 2nd century AD (Manniche 1989: 163).

named have since disappeared from academic works, such as the water lily and the lupin. Others, like crocuses and palms have been pushed to the fore, elbowing out the less certain ones from scholarly discussion. Also, it must not be forgotten that Möbius had a category for *Unbestimmbare*, or unidentified, something that subsequent scholars seem loath to include in their own interpretations, prefering to see hybrids rather than simply unidentifiable plants.

Case study: House of the Ladies - sea lilies or papyrus?

Sometimes different species have been suggested for the same plant, a situation which leads to opposing 'camps' being established. An interesting example of such a battle is that waged over the plants shown in the frescoes from room 1 of House of the Ladies at Akrotiri. Growing from a red-orange ground, these plants have a clump of basal leaves, and tall blue-green stems topped off with fan-shaped heads, featuring seven yellow stamens (fig. 15). The original excavator, Marinatos, after a first tentative suggestion of *Ornithogalum nutans* (Star of Bethlehem), changed his mind and noted that although the stems are lily-like, they do not display the leaflets which are a feature of true lilies. Neither does each stem have multiple flowers like a lily, but only boasts a single blossom, and so *Lilium* species could not be not the right answer either (Thera V: 38-39). He therefore concluded that the plants were probably sea lilies, *Pancratium maritimum* (Thera V: 38) (fig. 16). Warren noted several problems with this identification: the plants are too tall to be sea lilies (almost the height of the room); the flowerheads are the wrong colour (blue not white); and there are three stems to each base, whereas sea lilies only have one (Warren 1976: 90-91). He suggested therefore that the plant in question was rather "the finest and most naturalistic instance in the whole of Aegean art" of papyrus, *Cyperus papyrus* (Warren 1976: 91). Rackham agreed with this identification, but believed the painting to have been done by an artist who had not seen real papyrus growing, and so disagreed with Warren's assertion that the artist was familiar with the living plant (Rackham 1978: 757; Warren 1976: 92). Diapoulis discussed the sea lily in greater detail, accepting its identification in the Akrotiri fresco, and adding "I believe that all representations of flowers with an inferior ovary, many stamens and curved petals as in the Egyptian symbol *waz* are related to *Pancratium maritimum*, although much simplified" (Diapoulis 1980: 137). Morgan, while comparing this fresco to similar plants in the miniature landscape frieze of the West House, opted for the papyrus interpretation, believing that "here we have not so much a common as a garden plant" (Morgan 1988: 21), i.e. that it could have been grown in the Aegean, although was not native to the area (fig. 17).

In recent years, the debate has been renewed. Doumas, swayed by Baumann's illustration of the plant, returned to the *Pancratium* identification (Doumas 1992: 34; Baumann 1984: pls. 358-359), although this is based on what Warren calls "a completely artificially arranged picture of dried *Pancratium* flowers, with the outer petals removed and leaves cut and arranged to resemble those of the painting!" (Warren 2000b: 378). Furthermore, published almost side by side in the same volume, Porter backs the sea lily identification, while Sarpaki prefers papyrus (Porter 2000: 605; Sarpaki 2000b: 664). Indeed, after detailed analysis, Porter is left concluding "There are actually no realistic papyrus depictions in Aegean art to support the idea that it grew in the Aegean" (2000: 613). Morgan had tried to negotiate this issue by suggesting that Aegean artists added features to the papyrus which were familiar to them from native plants, so the leafy stem and anther-like dots actually were inspired by lilies, although papyrus was the intended plant (Morgan 1988: 23). A telling final comment from the discussion following Porter's paper wondered whether in fact the species depicted in the House of the Ladies is now extinct, expressing the perplexity felt by the academic world with ever trying to pin down this plant (Sherratt 2000: 630).

Summary

This papyrus/sea-lily battle gives a flavour of the endless discussions about species identification which have accompanied the discovery of floral frescoes. It must be said that plants depicted on ceramics seem to be less debated, and are generally assigned to whatever species they resemble from the wall paintings. The increased level of stylisation of much ceramic iconography also makes it less tempting to try and name them. The question of why it has been felt important to identify the plants shown in Minoan art seems to be overlooked in the rush to declare another yet motif as 'solved'. It cannot be denied that some Minoan representations of flowers and trees are exceedingly realistic depictions of individual species. The crocus fragments from the North Building at Knossos, for example, appear instantly recognisable to anybody who is familiar with such plants (fig. 18). With such examples, while there may be some disconcerting features, such as an unnatural colour, or an inaccurate rendering of the sexual parts, enough is 'right' to enable the viewer to feel confident in their identification. Other plant depictions defy classification, but still scholars queue up to offer the latest suggestion; for example, many of the plants from the Floral Fresco of the Unexplored Mansion at Knossos are unfamiliar, but attempts to identify them continue (e.g. Chapin 1997). Whether the original intended audience was able to recognise these plants, or whether this was even important for the function of the paintings and ceramics in Minoan society, is a question which has not been

considered by the academic community.

2.2 Naturalism in Minoan Art

This issue was touched upon briefly above, but deserves fuller exploration, as it has been at the heart of attempts to understand Minoan art since its discovery. It also relates to an assumption inherent in the endeavours to identify species: that a particular plant is intended by the artist, and is therefore depicted in a realistic and recognisable fashion.[19] Naturalism as a phenomenon extends beyond images of plants, to include animals and even landscapes in Bronze Age Aegean art. For example, Rackham claimed to be able to identify the precise place on Thera represented by the rocky landscape in the Spring Fresco (Rackham 1978: 759), while one of the towns shown in the miniature ship frescoes is thought to perhaps represent Akrotiri itself (Doumas 1992: 47; 49). This section examines a number of different approaches to explaining this phenomenon in Minoan art, with reference to flowers in particular.

Birth of the flower-lovers

Much early work on Minoan art is peppered with remarks about the realism or naturalism of the images, especially those of plants. Evans delighted in what he perceived as "an extraordinary development of naturalism in design" in MM III ceramics (PM I: 27). The frescoes equally amazed him: "The reeds and grasses, almost Japanese in their naturalistic fidelity, the crocuses and iris-like flowers, the sprays of olive and myrtle, that decorate the vases, reappear upon the Palace walls" (Evans 1900-1901: 52). Hand-in-hand with this apparent naturalism came the rise of the concept of the Minoans as a peaceful people, who liked painting flowers and surrounding themselves with scenes from nature. Cadogan's comment illustrates this tradition: "The frescoes with animal and plant scenes are the most delightful of the Minoan pictures and may do most to show that Minoan Crete was a civilized place to live" (Cadogan 1976: 44). For much of the twentieth century therefore, Minoan art was assumed to be not just reflecting the natural world, but also reflecting some sort of happy existence that the gentle Minoans led, with "an intimate and emotional understanding of life and beauty in all the works of nature" (Forsdye 1929: 29).

Eidetic Cretans?

One interesting, yet now largely forgotten, piece of work attempted to explain this apparent naturalism in Minoan art, albeit in a fashion which was not well received by the academic community. The publication of Snijder's *Kretische Kunst*

[19] The concept of naturalism in art, and more specifically the modern Western understanding that pictures intend to show plants in a realistic fashion, is discussed further in chapter three.

in 1936 applied contemporary ideas from psychology to the analysis of Minoan art. Snijder's hypothesis was that "Bronze Age Cretans were eidetics, sharing with other primitive peoples a power of actually projecting an image upon a surface and drawing it" (Hood 1981: 220). The theory of eidetics revolves around an intensification of visual memory, first noticed in children, but also found in those suffering from psychotic episodes or drug intoxication (Mayer-Gross 1937: 254). Eidectics can reproduce the details of objects or pictures as precisely as a psyschological after-image, but for a time period far exceeding any after-image; they can also re-access this image deliberately at a future date (Mayer-Gross 1937: 254). Furthermore, this was thought to be a stage of development in human life, and so "one might expect to find a similar stage in the evolution of humanity, e.g. in primitive people" (Mayer-Gross 1937: 255).

Snijder therefore suggested that Cretan artists were eidetic types, who lived in a primitive, eidetic phase of human development (Mayer-Gross 1937: 255). In striving to explain both the naturalism of some images and the surrounding fantastic ornament, particularly on Kamares ware, he offered a novel combination of eidetic artists with "self intoxication", postulating some form of sacred plant similar to the use of peyote by American peoples (Thompson n.d.). While Snijder was correct in noting that Kamares ware displays vast amounts of unique motifs, the idea of eidetic Minoans is surely pushing the limits of usefully applying psychological innovations to past societies. It seems accepted now that the human brain shares a way of functioning, both cross-culturally and diachronically.[20] But an eidectic function is not a human universal, and so for all artists of the Bronze Age to exhibit such a tendency would be impossible. Academic opinion of Snijder's idea can be summed up thus: "it is not very helpful either if another extreme of comparative method is used, and this primitiveness explained by postulating a peculiar type of visual memory which Cretan artists would have shared with palaeolithic man on the one hand and a modern mentally deficient child on the other" (Groenewegen-Frankfort 1951, III: 197).

Walberg and Minoan motifs

Apart from unconventional work such as that by Snijder, Minoan art was 'officially' deemed naturalistic for the first half of the twentieth century. Yet cracks started to appear in this doctrine as time progessed, leading some to consider that maybe Minoan art was not actually so realistic after all. Platon noted that "The art is ruled by conventions, and yet it looks equally naturalistic" (Platon 1964: 28) - an interesting conundrum. What were these conventions? One of the more important theories about the naturalism, or lack thereof, in Minoan art stems

[20] See Lewis-Williams and Dowson 1988 for a study based on such principles.

from the work of Walberg. Influenced by the studies of Furumark on Mycenaean pottery, Walberg examined the range of motifs on Middle Minoan Kamares ware. Furumark's concept of the syntax of a vessel, i.e. the relation between the shape and the decoration, formed the basis of her explorations (Walberg 1987: 11-12). This syntax is divided into two systems: unity decoration and structural decoration. Minoan art falls into unity decoration, with sub-categories such as torsion, radiation and elevation helping Walberg to analyse the ceramics further (Walberg 1987: 89). The crux of Walberg's argument is that "all the varieties [of motif] are ultimately based on simple geometrical figures, which have been elaborated in various ways" (Walberg 1987: 73).

Walberg does allow for some representational motifs too, and again follows Furumark in defining these as pictorial and pictorialised (Furumark 1941: 133-150; Walberg 1987: 65). A pictorial motif is one which is primarily representational and essentially naturalistic, while a pictorialised one grew from a link in the artist's mind between abstract elements and a physical object (Walberg 1986: 6-7). An example helps to clarify what Walberg means here. Firstly, where early excavators might have delighted in finding images of flowers, she prefered to see "antithetic J-spirals" (Walberg 1987: 49;) (fig. 19). This abstract motif then became pictorialised later in the Minoan period, to represent lilies and palm trees (Walberg 1987: 66; fig. 48) (fig. 20). In fact, she argues that all plant motifs can be traced back to abstract elements: "Lilies, palms, ivy, olive-sprays and vertical reed motifs are based on antithetic J-spirals and crocus-motifs, fig-leafs and tulips on leaf-like elements spreading from the same point. Horizontal reed motifs and olive sprays are based on two rows of loops (foliate bands)." (Walberg 1992: 241). Furthermore, she notes that the simple addition of rosettes or spirals to a motif gives it a plant-like character without actually turning it into a representation of a real plant (Walberg 1986: 14).

While it was certainly worth questioning the naturalism which was rife in interpretations of Minoan art, it is difficult to accept all of Walberg's assertions. The verisimilitude of some of the plant motifs makes it harder to believe the argument that they could be the result of a combination of spirals, lines and loops with no reference to the real world. Certainly her observation that the addition of a spiral or rosette adds to the organic character of a motif is true, but a distinction can be made between plant-like motifs, and those which represent actual plants. The question of intention is not something discussed by Walberg, but it surely must be considered - was the painter aiming for a realistic plant or not, and what were the reasons for this decision? Her interpretation also does not address the

question of the plant motifs on Neopalatial wall paintings, which are harder to break down into simple geometric shapes, although Walberg does claim this is possible, using the Amnisos lily fresco as an example (Walberg 1986: 73) (fig. 21). While such frescoes are later than the Kamares ceramics, surely there must be some link between the apparent floral motifs on the earlier pottery and the profusion of plant scenes in the wall-paintings?

In fact, the relationship between wall-paintings and ceramics has been debated continually, particularly the issue of in which medium did motifs develop? Plant motifs often have been the basis for conclusions on this topic, although using the same material has led different authors to differing conclusions. The jar with a triple palm motif, from the Loom Weight deposit at Knossos, is one example of an artefact which has been used as proof for both sides (fig. 22). This MM II vessel displays three palm trees with inflorescence "naturally rendered", painted in a creamy white with red details against a black background (PM I: 253). Evans thought that "we may reasonably detect the reflection of a pictorial style taken from the Palace wall-paintings" (PM I: 256). He saw a relatively naturalistic motif on an amphora, and assumed it was inspired by a contemporary or earlier fresco, despite not having found any such frescoes in his excavations. In a later volume, Evans returned to the triple palm motif, this time on ceramics of the Neopalatial period, but he still stressed the importance of tracing this motif back to "fresco designs on the walls that were in vogue in the preceding Age" (PM II.2: 499).

Walberg considered the same motif, from the same jar, as closely related to more abstract designs which appear on several vases from Phaistos (Walberg 1986: 81). She saw them as consisting of antithetic J-spirals, a popular Kamares motif within her classification system (Walberg 1986: 81). The palm motif first appeared, she believed, in the Classical Kamares phase (MM IIb-MM IIIa), but was less frequent in LM I (Walberg 1992: 243). There is no possibility of palm trees deriving from frescoes for Walberg when she can trace the development of the motif on ceramics. Ultimately, Walberg concluded that as the plants on frescoes often are arranged in balanced groups, they may in fact have been inspired by Kamares designs where such groups appear on ceramics (Walberg 1986: 86). The early fresco painters then borrowed these motifs for use in their own medium "when they wanted a representational vocabulary, especially to fill out space in a landscape and to form a background." (Walberg 1986: 88). She did concede however, that in the Post-Kamares phase (MM IIIb) new pictorial motifs were probably borrowed from wall-paintings (Walberg 1987: 126), despite the lack of evidence for such frescoes.

Shank has argued the case for a contemporary development of plant motifs on ceramics and wall-paintings, using the "Floral Landscape Group" as evidence (Shank 2001). Once again the palm motif is called upon, as well as lilies, crocuses, grass, and the existence of a groundline. She noted many similarities between the MM III ceramics and the LM landscape paintings, and explained the more detailed nature of the frescoes by the simple fact that there is more room for elaboration on a wall than on a pot (Shank 2001: 76). Transference of ideas between the two media is allowed, and so although growing from the same background, landscape wall-paintings and ceramics then develop in different directions (Shank 2001: 79).

A natural geometry?

Returning to the issue of naturalism in art, Crowley opposed her own ideas to those of Walberg and Furumark, seeing the world of nature as an inspiration to the Minoans. However, it was not just the flowers, birds and animals which inpired the artists, but "the underlying structure of living forms" (Crowley 1997: 89). She analysed various motifs on Minoan ceramics and seals and noted the precise geometry present in them, based largely upon the circle, but also using arcs, ellipses, spirals and triangles (Crowley 1997: 88). This led her to wonder what could have provided the inspiration for such geometry. Her answer was "living forms are seen to have underlying geometric constructions based on the circle and its divisions, the spiral and curvilinear shapes but not on the rectangle" (Crowley 1997: 89). For example, the lily and crocus, common flowers in Minoan art, both have six petals in the real world, and to divide the circle into six is a simple geometric procedure; whereas flowers with five petals, common in nature but more difficult in geometry, are much rarer in art (Crowley 1997: 89, n.42-43). So Crowley seems to say that the Minoan artist perceived an order within nature, and the best way of representing this was to use geometric procedures to represent the plants. The fact that representations of lilies and crocuses in art only show three petals does not seem to be a concern for her. Certainly, the underlying order of the natural world is a fascinating topic, and theories like that of the Fibonacci numbers seem to correspond magically with plants and animals. This sequence, commencing with 1, 1, 2, 3, 5, 8, 13, and continuing by adding the previous two numbers together each time, provides a structure for many elements in nature, from petal numbers, to spirals on pine cones, to leaf arrangements on plant stems (Knott 2004). Indeed, it is a little surprising that Crowley does not refer to this famous series in her article. Yet even if Minoan art is based upon more precise geometric principles than Walberg's J-spirals, the flowers themselves remain a mixture of realistic and less realistic creations. What is interesting is that societies might draw upon perceived relationships and

structures within the plant world for their art, yet Crowley's methods and such ideas have received little discussion or follow-up.

From naturalism to essentialism

A final comment on naturalism in Minoan art belongs to Peter Warren, who recently has turned his attention to the question, attempting to get to the cognitive processes behind the images. He suggested that the Bronze Age artists depicted the real world on a representational spectrum ranging from near naturalistic to essentialist (Warren 2000b: 365). The near naturalistic images are closely based on nature, while the essentialist ones reproduce only the essential characteristics of each form (Warren 2000b: 365). Warren sees crocuses falling on the naturalistic side of the spectrum, as features such as leaf shape and size, flower shape, clustering of blooms and prominent red stigma are indeed close to those seen on real crocuses (2000b: 371). Sometimes features which do not belong to real crocus species appear, such as the unrealistic colour of leaves, or the divided calyces, or the bright colours of the petals (Warren 2000b: 371). Other features of real-life species are usually left out, such as the veining of the leaves (Warren 2000b: 371). To realise this variation exists helps to understand why there have been so many unsatisfactory attempts to identify the crocus species. At the other end of the scale, Warren sees the reed fresco from Akrotiri (Xeste 3, room 3b) as essentialist. All the essential elements of reeds are depicted (tall stems and yellowish leaves) but the densely packed plants of real life are not shown (Warren 2000b: 378). He summed up by writing "at whatever point a representational image lies on the visual spectrum during the Middle Minoan III-Late Minoan/Late Cycladic I period, it owes more to real world forms, to observation of them and to selection of their essential characteristics than to recombinations of older abstract and pictorialised motifs or to convention or artistic license." (Warren 2000b: 378). Ultimately, the only undisputed conclusion possible at the moment is that the degree of naturalism of the plants shown in Bronze Age iconography remains a contested topic, and will probably continue to cause debate for years to come.

2.3 Hybridisation in Minoan art

Closely interwoven with the previous two themes comes a third, omnipresent when dealing with plants in Minoan art: the theory of hybridisation. Technically, hybridisation is the production of offspring from parents of different species, or genetically different strains of the same species, often leading to a new species which most likely will be sterile (Moore *et al.* 1998: 564). The practice of breeding real life hybrids of plants has long been carried out, and many species can also hybridise naturally. For well over a thousand years, humans have created hybrids

of plants and animals with the aim of encouraging certain favourable characteristics, such as flavour, disease-resistance, or colour. For example, Pliny the Elder mentions many intentionally-created hybrid varieties of fruit from the Roman era (*NH* XV.15). Whether the Minoans ever created plant hybrids in real life has not been asked to date. However, that they intentionally mixed characteristics of different species in their art is one way for modern commentators to deal with the difficulties encountered in pinning certain plants down to one single species. Such a practice was also seen as showing artistic inventiveness within the confines of a limited repertoire of motifs, although this idea is dismissed by Chapin based on the expanding pictorial vocabulary in Neopalatial painting (Chapin 2004: 55). It seems that hybridisation is called upon by those confounded by yet another floral motif which refuses to be pigeon-holed.

In this age of genetic engineering, such a theory could easily be seen as a modern answer to the problems of identifying the plants, but Evans and his contemporaries were already considering such hybridisation as a deliberate practice. In relation to the frescoes from Ayia Triadha, Evans cited Halbherr's observation that a certain hybridism is noticeable, with leaves of *Liliaceae* combined with flowers of *Compositae*, and white violets having leaves more suited to brambles (Evans PM II.2: 539). He was not adverse himself either to producing a hybrid motif when he could not find a suitably exact one from the real world: the so-called sacral ivy was invented to fit what Evans saw as a mixture of papyrus, its decorative canopy, and ivy, as seen in the House of the Frescoes Birds and Monkeys scene (PM II.2: 466; 478-489; fig. 286). It is not just plants either which appear to hybridise, but animals too (e.g. the antelopes from Beta 1 in Akrotiri) (Morgan 1995a: 180-184).

The Lilies of the 'Spring Fresco'

The flowers from the 'Spring Fresco' of Delta 2 at Akrotiri have been at the forefront of this hybridisation issue. This scene comprises plants which display characteristics of lilies, growing amongst a rocky landscape, while swallows fly overhead (fig. 23). The flowers themselves are red, and appear as buds, as trumpet-shaped blossoms, and as fully re-curved blossoms. Their yellowy-brown stems, with leaflets sprouting from them, grow from a clump of basal leaves. Marinatos originally suggested *Lilium chalcedonicum* for the species shown here (Thera IV: 50). This is a the red lily found in Greece, with a densely leafed stem whose flower heads droop downwards as the petals recurve (Sfikas 1998: 77) (fig. 24). Rackham was the first to point out that although the Spring Fresco flowers

were red lilies, the flowers are all upright and so are not faithful representations of *L. chalcedonicum* (Rackham 1978: 756). This upright position of blossoms is rather a feature of a different lily, *Lilium candidum*, the white Madonna lily, which has also been identified in Minoan art (Warren 2000b: 373) (fig. 25). The Lily Fresco from Amnisos features this white flower, but again, on closer examination, it seems to include a characteristic of a different lily: the strongly recurved petals of the *L. chalcedonicum* (Warren 2000b: 373). So although both frescoes are nearly accurate representations of the red *chalcedonicum* and the white *candidum*, they also each exhibit a key characteristic of the other species. As Cerceau put it "Une espèce imaginaire est ainsi 'créée' à partir de deux éléments empruntés à la réalité" (Cerceau 1985: 181), or, in other words, a hybrid is born.

There does not seem to be any belief that the Minoans ever actually cultivated a hybrid lily, and so it must be assumed that these lilies are purely artistic creations. Rackham wondered whether such "mistakes" could arise because the artists were often painting from memory, or from previous pictures, rather than real life, due to the lily's brief flowering period (Rackham 1978: 756). Another explanation for this practice is that the Minoans had a standard way of painting lilies, but the colour of the background or overall colour scheme of the scene affected the flower being painted onto it (Warren 2000b: 373). When the background is white, as in most Theran frescoes, the flower would naturally have to be a different colour to be visible, so in the Spring Fresco they are painted red. Baumann believes this to be the reason for the different colours, and views both red and white lilies as belonging to the same species, *L. candidum* (cited in Negbi and Negbi 2000: 597). This leads towards an interesting question: "is form or colour more likely to be changed?" (Hollinshead 1989: 353). Hollinshead thinks that colour is of primary importance, and so form is more likely to be altered, i.e. it does not matter if the lily is not morphologically identical with its real world inspiration, as long as by getting across the essential characteristics and the colour, the viewer can understand the message of the scene. Following this reasoning would then lead to selecting *L. chalcedonicum* as the model for the Delta 2 wall-paintings. Sarpaki considers that the combining of features of two species of lily indicates "the semiotic significance of the plants and the complexity of their symbolism" (Sarpaki 2000b: 659). Not many authors have spent time considering the symbolism of plants, so it is unfortunate Sarpaki does not probe any deeper than suggesting the lilies' meaning transcends time, and so, as in today's (Western) world, white flowers represent purity while red stands for desire (Sarpaki 2000b: 659). Certainly colour symbolism could be an important avenue to investigate for Minoan art, but to thrust such contemporary beliefs onto the Bronze Age may

lead to fallacious conclusions.

The waz-lily

A more complex form of hybridisation has been assumed to occur in the motif known as the '*waz*-lily'. This apparent combination of two different species, papyrus and lily, was first identified by Evans. He saw it as a fusion of two sacred plants; the *waz* or sacred papyrus stem of Egypt, and the lily, "pre-eminently the Minoan sacred flower" (PM II.2: 776). In this combination, the usual outward-curling petals of the lily are separated by a roughly triangular tuft rising from the centre, reminiscent of the head of papyrus flowers as depicted in Bronze Age art (fig. 26). Evans identified many instances of this motif on different media, from pottery to bronze vessels to wall paintings (e.g. PM I: fig. 249; PM II.2: fig. 285d; PM II.2: fig. 419a). Since then, it has joined the canon of traditional Minoan motifs, yet it is worth re-evaluating, and asking the question "was there a *waz*?"

When Evans was writing about a *waz* he seems to have had in mind the papyrus stem carried as a sceptre by the Egyptian goddess Wadjet (PM I: 509; Ions 1982: 88). Also known as Wazet, Wadjyt, Udjat, Edjo, Buto and Uto, she was the protectress of kingship in the north of Egypt, a parallel to the vulture goddess Nekhbet in the south, together with whom she formed the *nbty*, the symbol of unification of that country (Shaw and Nicholson 1995: 302; Johnson 1990: 5). Wadjet was able to take the form of a serpent, and often had a snake entwined around her papyrus sceptre too, attributes which led Evans to make a connection between her and the Snake Goddesses of Knossos (PM I: 509). The origins of the *was*-sceptre and its iconography are much discussed.[21] One suggestion is that its two-pronged appearance may derive from an early totemic motif, associated with prosperity (Shaw and Nicholson 1995: 304). Traunecker, on the other hand, says the *was*-sceptre derives from a forked stick used to catch serpents (2001: 52). Whatever its origin, the *was*-sceptre came to stand for power and dominion, and eventually was carried not just by divinities but by kings, and even private individuals in a mortuary context (Wilkinson 1992: 181).

Regardless of the background to the *was*-sceptre, Evans was certain of a close connection between Minoan Crete and Egypt and this belief drove many of his conclusions. For example, to find the *waz*-lily motif around the neck and in the crown of the Lily Prince signified to Evans that this figure was the Priest King of Knossos, and strengthened his idea of religious links between the two countries (e.g. PM I: 509-510; PM II: 431-441). Whether such a motif was a deliberate

[21] While Evans, and Aegean Bronze Age academics following him, use the spelling *waz*, Egyptologists seem to prefer *was*.

mingling of two sacred plants, perhaps indicating an assimilation of religious belief, or an artistic development of a pleasing pattern, should be considered in greater depth by scholars. Certainly, the *waz*-lily can be seen as an iconographic hybrid, but whether it meant more than that to those who created and viewed it remains unclear.

Further issues

It is surely a temptation for archaeologists to declare any plant motif which they are having problems identifying as a hybrid. Chapin suggests that several of the motifs in the floral fresco from the Unexplored Mansion at Knossos are hybrids. She identifies this as the first instance in Minoan art of both the 'anemone-reed' hybrid and the 'osier-lily' hybrid (Chapin 1997: 3; 5).[22] But does this actually mean anything, or is Chapin trying too hard to provide labels for each plant depicted? Certainly there are similarities between these and other Aegean plant representations, such as the osiers of Delta 17 (Chapin 1997: 10), or the flowering sedges of the West House miniature landscape (Chapin 1997: 17). That such apparent links suggest communication among artists throughout the Aegean is an interesting possibility, and is considered in greater detail in section 2.5 below. A key point about true iconographic hybrids must be the intent behind the image: the artist deliberately selecting two or more plants from within his/her repertoire and uniting them to form a new motif, possibly combining the meaning of the selected flowers also. Is this what happened with Chapin's 'osier-lily', or was the artist merely painting 'plant-ness' to fill up a scene, using the generic leafy forms (s)he knew already? If it is a deliberate hybrid, what could the meaning of such a plant be? Comparing the creation of animal hybrids, such as griffins and sphinxes, which are seen as special or divine, Chapin recently wondered if floral hybridisation could also have been used to signal divinity and the power to create and transform nature (Chapin 2004: 56). If, on the other hand, such scenes are just generic plants, why would this be appropriate decoration for a room? To answer such questions depends on the meaning both of the scenes, and of the plants themselves, something which is explored in greater detail later in this work.

2.4 Cultivation, Domestication, and the Implications

The relatively certain identification of at least some of the plants in Aegean Bronze Age art has enabled commentators to discuss whether some of these species were actively cultivated by the people who were painting or viewing them, or if they were only found in the wild. If they were cultivated, could any of them be said to be domesticated? The key difference here is that while cultivated plants are

[22] However a flower identical to Chapin's anemone-reed hybrid can be seen on a seal: CMS II.5, 270.

selected by humans and carefully tended, often in gardens or fields, domesticated plants are ones which through a long period of human manipulation have altered their physiology or life cycle.

Case study: domesticated palms?

There has been much debate about whether the various palm trees in Minoan frescoes are cultivated or wild, fruit-bearing or sterile. The miniature River (or Nilotic) scene from the east wall of room 5 of the West House, Akrotiri, features a number of palm trees, and has been at the core of this debate (fig. 27). Initially all palms in Aegean art were thought to show *Phoenix dactylifera*, the edible date palm (Morgan 1988: 24). Evans thought that the Minoans had introduced such palm trees to Crete (PM I: 254, n.1), although from where or why he did not say. The date palm is native to north Africa, the Middle East and India, flourishing in semi-arid regions (Stewart 1994: 150), and so theoretically could have been introduced to Crete from neighbouring lands. The more recent botanical recognition of an endemic Cretan palm, *Phoenix theophrastii*, allowed another possibility for identifying the palms in art (Morgan 1988: 24) (fig. 28). Morphologically however, there is no difference between these two species when they grow in the same climatic region, and so distinguishing between them in frescoes is not possible (Morgan 1988: 24). A further palm considered to be present in the West House frieze is the dwarf fan palm, *Chamaerops humilis* (Morgan 1988: 29).

Palm trees appear in other Bronze Age frescoes, as can be seen in Table 2.1. They possibly appear at Archanes (Sakellarakis and Sapouna-Sakellaraki 1997: figs. 483, 486); unlikely at Tylissos despite Shaw's theory (Shaw 1972: 187; see Hazzidakis 1921 for alternate interpretation); and originally on the walls of the Throne Room at Knossos, although not included in Evans's reconstruction (Brown 1983: 40; fig. 22a; Cameron 1978: figs. 3, 7). Later examples come from Mycenae (Kritseli-Providi 1982: fig. 3; Pl. 1), Orchomenos (Spyropoulos 1973: fig. 3g) and Pylos (Lang 1969: pl. 73, pl. H). A further fragment from Akrotiri, from A1, shows palm foliage, and the head of a male (fig. 29), and is strikingly similar to a fragment from Tell el-Dab'a in the Nile Delta, although here more of the male's body is evident (fig. 30). A palm is also visible in the bull-leaping scene from the same site (Bietak 1996: pl. IV). Palms also appear on ceramics, throughout Walberg's Classical Kamares period (MM IIb-MM IIIa), although seemingly becoming less popular in LM I (Walberg 1992: 243).

Whatever species is shown, the question of whether the West House palms are growing wild or cultivated has been one of the main preoccupations of

commentators on the fresco. Rackham observed that "These are not palms in a state of nature, in which the trunk is concealed by a mass of dead fronds; they seem to be *cultivated* date-palms" (Rackham 1978: 757). It is likely that the trees were tended by humans, as they show evidence of having had the dead fronds cut away, which eventually leaves a scarred, leafless trunk (Rackham 1978: 757; Sarpaki 2000b: 663). As well as providing edible dates and heart of palm (the terminal buds), and date-based alcohol, the trees are useful for timber, and rope and other products can be made from from the fibres and leaves, thus making it a worthwhile plant to cultivate (Blombery and Rodd 1982: 6-7). Morgan notes that due to the colder climate the date palm does not bear fruit fit for consumption as far north as Greece (Morgan 1988: 25). Pliny the Elder knew this, writing that even if the palm does grow in certain places, "it will not bear: sometimes, indeed, it may make a show and promise of bearing, but even then its fruit comes to nothing" (*NH* XVI: 59). This lack of fruiting could indicate that if the trees were grown in Minoan Crete, they may have had another role than date production, perhaps even a ritual importance, something which has indeed been suggested (Marinatos 1984a; Walberg 1992: 244). To take the matter further, if the trees are shown bearing ripe (red) fruit in Minoan or Theran art, they cannot have been painted from life in that region, and so cannot be intended to represent a realistic Aegean scene. However, if the fruit is shown, but not in fully ripe form (i.e. green or yellow), it could reflect a tree actually growing in the Aegean.

On the West House palms the inflorescence cannot be sufficiently distinguished to tell whether it is ripe or unripe dates, or a even flower, which grows on male trees.[23] Morgan notes though that the palm fragment from A1 in Akrotiri displays red dates, and so it is female and bears ripe fruit (Morgan 1988: 25; Pl. 32). Does this then indicate a scene set in a different country? The figure beside the tree has been identified as having "markedly African features" (Doumas 1992: 184). Rackham considered the Nilotic miniature frieze to be set in North Africa or the Middle East, where the artist would be familiar with cultivated palms (Rackham 1978: 757). Sarpaki suggested the scene portrays a park tended by humans, but added that it is a landscape which could have existed in Greece (Sarpaki 2000b: 663-664). Presumably she had in mind a park reminiscent of the great paradise gardens of the Near Eastern monarchs. Palms can propagate from seed or vegetative cuttings relatively easily, as well as be transported as mature trees, and so to grow them in the Aegean would not have been difficult (Stewart 1994: 28-31). It may be that palms were imported from further east or south during the Bronze Age, and although they did not fruit in the region, knowledge of this possibility existed, and so sometimes was painted. It is interesting too to consider

[23] *Phoenix dactylifera* are dioecious, i.e. male and female inflorescences grow on separate plants.

that the fruit may not have been important, and the tree had another role in Minoan life.

Other plants and further issues

Another plant which has been much discussed for similar reasons to the palm tree is the papyrus: did this grow in the Aegean during the Bronze Age? Identified in a number of frescoes from all over the region, it would have had to have been deliberately cultivated to enable local artists to draw it from life. Warren concluded that Aegean artists were familiar with the plant, despite it not being native in that region (Warren 1976: 92-94). Betts identified numerous instances of the papyrus plant appearing in glyptic art, and agreed with Warren that it most probably did grow in the Aegean (Betts 1978: 74), as indeed it can do today (fig. 17). Neither of them address how the plant might have got to the Aegean, or, more interestingly, why? If it was not growing on Crete or Thera in the Bronze Age, how did it make its way into the artistic repertoire of these societies?

This confusion over whether certain plants were deliberately cultivated, or even actually growing at all in the countries where they were depicted occurs also with regard to the Aegean-style paintings from Tel Kabri in Israel, and Tell el-Dab'a, in Egypt. In the hall of the palace at Tel Kabri, flowers thought to be irises and crocuses were painted in squares on the floor (Niemeier and Niemeier 2000: 773-776) (fig. 31). Yet neither of these flowers, so familiar from Aegean art, were part of traditional Canaanite iconography (Niemeier and Niemeier 1998: 76), although species of both do grow in Israel. Similarly, while plants native to Egypt did appear at Tell el-Dab'a, some others like lilies and olives do not naturally grow there (Niemeier and Niemeier 1998: 80).

The debate over whether or not palm trees were cultivated in the Aegean extends to encompass broader issues: whether the wall-paintings are intended to be situated within the Aegean, or further afield, or even in an imaginary land. When instances of Aegean plants turn up in other regions, were they deliberately cultivated there, or was their depiction intended to evoke ideas of the Aegean landscape? Perhaps the degree of standardisation among motifs implies a pan-Mediterranean hierarchy of plants, which get depicted regardless of whether they grow at the site of the paintings or are native to another country? This idea ties in with Knapp's emphasis on "the likely coding of elite motifs" (Knapp 1998: 204). Reading such images, he suggests, demanded an understanding of foreign and exotic signs, a language shared by elites around the eastern Mediterranean coastline (Knapp 1998: 202). Such issues are explored further in the following

section.

2.5 Travelling People, Travelling Ideas, and Travelling Plants.

The conundrum discussed above about papyrus appearing in the Aegean, or crocuses in Israel, leads to a key issue within Aegean iconographic studies: how do motifs move around the region? This has been of particular concern to those who study wall-paintings, and so it is on the frescoes that this section mainly focuses, although many of the same questions could be asked of other media. It is well-established that a kind of *koine* of subjects can found throughout the Bronze Age Mediterranean. Wall-paintings featuring elaborately dressed females, bulls, architectural structures, processions, monkeys and other animals, and of course, plants, occur regularly, although not all are found at every site with paintings. This section considers whether this was the result of travelling artists, exchange of ideas, or movement of plant species around the Mediterranean. Table 2.2 shows the geographical range of lily frescoes, as an example of the widespread occurence of a floral motif.

Travelling people

Travel was common throughout the ancient eastern Mediterranean, for trade, diplomatic, or other reasons, especially in the late Bronze Age (Cline 1995). The concept of travelling artists has been based on technical and iconographic analysis of paintings from around the region. There are a number of similarities, apart from subject matter, which suggest direct personal links across the region. For example, the frescoes from Tell el-Dab'a, as well as being Aegean in their iconography, are also Aegean in their materials. The plaster is lime, not gypsum as was common in Egypt, relief stucco is used, another rarity in Egyptian art, and even the colours selected reflect the Aegean palate (Morgan 1995b: 33; Bietak 1996: 75-76). Similarily, the techniques used at Tel Kabri are those found in the Minoan frescoes (Niemeier and Niemeier 2002: 255). There are notable differences between the frescoes of Thera and Crete (see e.g. Davis 1990), but on the other hand, the numerous similarities encourage the notion of some form of direct artistic contact. Even Evans, weighing up the subject matter of some of the Cretan frescoes, considered the movement of artists a possibility: "The reproduction of Nile scenes by Minoan artists is at times so accurate and detailed as to convey the impression that guilds of Cretan craftsmen were actually working at this time on Egyptian soil" (PM I: 18). Laffineur has more recently followed this belief, seeing the 'Nilotic' art in the Aegean as a result not just of importing objects with Egyptian motifs, but of Aegean artists' presence in Egypt and exposure to the paintings there (Laffineur 1998: 64). Likewise, Immerwahr considers that Aegean

artists actually viewed paintings in Egypt, which inspired them to create similar motifs back in their own land (Immerwahr 1985: 41). Boulotis too is convinced that the fresco decoration found throughout Crete and the eastern Mediterranean was the work of travelling artists, either freelance or dependent on a central authority, such as Knossos (Boulotis 2000).

Although focusing on the Near East, Zaccagnini developed three models for mobility among craftsmen in the Bronze Age, which may be worth bearing in mind when thinking about possible travelling fresco painters. Using textual evidence, he makes the key point that craftsmen at this time were dependents of the administration, a result of a surplus which meant temples and palaces could employ specialists in return for board and lodging (Zaccagnini 1983: 245). On Crete, such a situation seems to be borne out by the evidence for luxury goods workshops at palaces,[24] as well as the control of specialists recorded in the later Linear B archives. Zaccagnini posits a general insufficiency of artisans at this time, making control of their movements important, and, in fact, leading to a situation where specialists are treated like gifts: requested, refused or dispatched among the powers that be (Zaccagnini 1983: 248; 253). In his redistributive pattern, craftsmen are sent out from the centre to needy, peripheral places, and then returned once a certain job was over (Zaccagnini 1983: 248). His reciprocative pattern involves exchanges of skilled labour, seen as prestige goods, between centres of power, e.g. the exchange of physicians between Egypt and Hatti (Zaccagnini 1983: 250). His final model, a commercial pattern, involves craftsmen searching for work of their own free will, a development he believes did not occur until after the fall of the Mycenaean palaces (Zaccagnini 1983: 258). Importantly for the debate on travelling fresco painters, Zaccagnini is strongly against the idea of itinerant specialists, who constantly wandered from place to place; rather he sees them as in demand and travelling temporarily until they find employment for a defined span of time (Zaccagnini 1983: 258-259).

The apparent link of floral motifs with centres of power and privilege, and the similarity of motifs at each place, certainly makes a good case for the exchange of artists between the elite of the time. However, the traditionally persistent view, where Aegean artists travel around the Mediterranean, and return with fresh ideas for their own walls, seems to make little allowance for a transfer of motifs through the medium of visitors to the Aegean. Surely if artists were moving between the civic centres of the eastern Mediterranean, some would have come *to* Crete, as well as gone *from* there. To what extent an Aegeo-centric view has led to this situation is uncertain, but evidence for foreign craftsmen in Crete does seem

[24] See, for example, Foster 1987.

quite minimal. For example, one solution to the troubling palm tree question is that the trees could have been painted by artists who came from foreign lands where date palms do bear ripe fruit, and who would naturally paint the tree in the way they were used to seeing it. Such a suggestion is followed by asking whether it is possible for an artist to learn to paint in a totally different style to that which his native culture has fostered? Could a painter from Egypt, schooled in the stylised manner of representation there, be able to adapt to the Aegean manner of depicting things in a less formal way, hence leading to fruiting palms and sprouting papyrus?

Within the Aegean, there have been attempts to identify individual painters or schools of painting, focusing particularly on Crete and the Cyclades.[25] It must be remembered that Bronze Age artists did not sign their work, and so to focus on limited geographical areas in the hope of identifying a regional style is the only way forward, although artists may not necessarily have come from the area where their work survives (Chapin 1997: 10). While recent studies have looked for artists at Thera,[26] Cameron studied the concept of regional schools in great detail, and saw individual painter's hands within the corpus of frescoes at Knossos (Cameron 1975). Furthermore, he not only identified separate schools at Knossos (e.g. House of the Frescoes school and Caravanserai school), but believed artists trained at Knossos executed pictures elsewhere on Crete (Cameron 1978: 588). For him, the concept of a travelling artist was key to the development of motifs across the island and further afield.

Certainly, within the body of floral depictions, it is possible to detect both identical and different versions of the same species within a limited geographical area. Using the example of the crocus, stylistic differences can be observed between its representations from different sites. The basic three-petalled shape with visible stigmas allows for many small variations, such as number of stigmas, shape of flower, presence or absence of calyx, and type of accompanying leaf. Höckmann made a crude distinction between those of Thera and those from Crete, declaring that the Theran plants "are shown in a most naturalistic manner, thick bushes of slender leaves spreading irregularily in every direction", while Knossian examples are "stiff" and "far from reaching the liveliness of those from Thera" (Höckmann 1978: 607). Such subjective analysis is not very helpful in attempting to trace iconographic links between the islands, even if a difference in style can be noted. On Crete, the LM Ia crocuses from the House of the Frescoes, in both the Birds and Monkeys frieze and the Crocus and Agrimia Panel, have tapering flowers

[25] For discussion on the broader issue of assigning hands to Bronze Age art, see Cherry 1992.
[26] See Televantou 2000 and Davis 2000.

which almost reach a point where they join the stalk. The divisions between the petals are also quite deep, reaching half of the total length of the flower (e.g. Cameron 1968: fig. 6). These crocuses are therefore identified as belonging to the same hand. Even within Knossian work however, different styles can be noted. The LM Ib crocuses from the Knossos Stratigraphical Museum site, North building, exhibit a much rounder base, the petals only dividing about two-thirds of the way to the top, and the flowers even include an unusual blue calyx (fig. 18). Crocuses with calyces can also be seen in the Ayia Triadha room 14 scene, but here they have more prominent stigma than the other examples cited (Warren 2000b: fig. 7). In all these examples, the flowers are obviously intended to be the same species, but while some do seem to share a painter, others reflect a similar concept but a different execution. Whether there was ever an original 'Alpha crocus' fresco, or a pattern book, which was the model for all other frescoes is improbable. More likely is that the idea of crocuses as important plants spread across the Aegean, with local artists inspired mainly by real plants, and perhaps occasional contact with other artists.

Travelling ideas

This leads to another option for how motifs travel: movement of ideas, not necessarily accompanied by artists. Morgan identified a specific Cycladic iconography, based on material from Thera, Milos and Keos (Morgan 1990). She concluded that the Cycladic wall-paintings have more in common with each other in terms of iconography (e.g. marine scenes) than technique, suggesting "a common tradition with different artists working on each island." (Morgan 1990: 263). This implies that it was the ideas for motifs rather than the artists themselves which were moving fluidly around this area. Rather than travelling painters, Morgan suggested some form of common training ground where artists exchanged ideas, if not precise techniques, leading to local versions of popular Aegean-wide themes (Morgan 1990: 263). It is into this realm that the models of iconographic transfer proposed by Crowley (1989), Warren (1995; 1985a) and Morgan (1995b) apply.

Crowley's investigation of iconographic transference is a useful place to start exploring such issues (Crowley 1989). In her analysis, she considers what type of motif could be expected to emerge indigenously as opposed to receiving impetus from overseas:

> "where the motif comprises the depiction of ordinary flora or fauna or some piece of everyday equipment where it is a simple pattern, or where a theme of universal interest to man is represented, even though

there may be artistic traditions close by which are using or have used the same motif earlier." (Crowley 1989: 181-182).

Certainly plants are part of life the world over and appear in art in vast quantities, but Crowley's logical proposition underlines the impossibility that specific plant representations would originate in countries where the living species are not native or part of daily experience. Rather, the motif must be introduced from abroad. This is what she believes happened with the papyrus motif, for example. The Aegean versions of this plant in the reed form reflect the influence of Egypt, while the stylised versions are closer to Syrian variants (Crowley 1989: 185-186). Such a motif cannot just appear of its own accord in a country where it has no history.

Warren breaks down the steps involved in such a transfer of a motif from one society to another, in this case again between Egypt and Crete, without necessarily involving travelling artists (Warren 1995: 2). Firstly, an existing thought or belief is transferred into a visual form to which a symbolic value adheres. This visual form is then seen by an artist from another culture, or described to such an artist by a traveller. The artist then relates his/her own understanding of the motif to the beliefs of his/her culture, and so represents it within the iconographic principles of that culture, complete with a modified meaning. In this way, representations of the lily, for example, could spread around the Mediterranean (table 2.2), although whether the meaning behind the iconography differed between locations remains unanswered.

Morgan sees iconographic transfer as having three main forms: motif distilled, motif developed, and iconographic parallelism (Morgan 1995b: 31). In a motif distilled scene, only the elements which make sense within their new context are included - exclusively foreign elements are left out. She provides the example of the common Egyptian scene of hunting and fishing in the marshes, which when transferred to an Aegean context excludes elements such as Egyptian birds and papyrus boats, but retains others like cats, water and plants, which do make sense in the Aegean (Morgan 1995b: 31). Whether this would work when applied to individual motifs like lilies seems unlikely - either lilies grow in a certain country, and so are familiar, or they do not, and so no elements of the motif are more relevant than others. It could certainly be copied, but not distilled. For the concept of motif developed, Morgan discusses the iconographic transfer of the monkey from Egypt to the Aegean, a region where the animal was not native. She notes that in the Aegean, the monkey was not only adopted into pictorial programmes, but "the meaning of the animal symbol elaborated to fit the local flora as well as

the local religion" (Morgan 1995b: 31). This is the sort of process Evans believed happened with the Minoan incorporation of Egyptian papyrus, or *waz*, into the local iconography and belief system. In Morgan's final category, iconographic parallelism, although the motifs may not resemble each other at all, they bear the same meaning, e.g. the lion as symbol of ferocity and power (Morgan 1995b: 31). Amongst the depictions of the plant world in the ancient Mediterranean, it is difficult to think of an example where the motif may share the same meaning, but has a different form of representation. As has already been noted, the plants are depicted similarly throughout the region.

Knapp's suggestion of "elite motifs", mentioned briefly above seems a more satisfactory way of explaining the similarity of floral, and other, motifs across a wide region in the Bronze Age. Close contact with foreign nations would have been limited to the elite, through a network of trade, conquest, exchange, inter-marriage and other kinship ties. Contact brings not only exotic material goods, but knowledge. For Knapp, contact with Egypt, for example, represented access to power and knowledge associated with the 'Other' (Knapp 1998: 204). This is based on Helms's idea that "those who wish to acquire power must become experts on things and places 'outside'" (Helms 1988: 13). It then becomes possible to differentiate between those who have exotic goods, and know how to obtain and use them, and those who may occasionally glimpse such mysterious and fabulous objects being utilised by elites. With regard to artistic motifs, Knapp suggests that the images themselves are not as significant as the actual travel or distance to foreign lands which was necessary for the iconographic transfer (Knapp 1998: 204). In the Aegean world, Oriental motifs may have had an exotic value, he adds; presumably, this works in reverse also, and that Aegean motifs would have held the same allure for those further afield. The movement of popular motifs around the centres of power would ultimately lead to the rise of an elite language of common representations throughout the region, possibly even the expectation that such motifs would be depicted in elite contexts. Indeed, this is what Crowley proposed for the Late Bronze Age, when the transference of motifs which had been happening since Prepalatial times reaches a plateau of motif sharing, which she terms "the International Repertoire" (Crowley 1989: 192-199). That similar floral images occur around the Mediterranean may not be linked with movement of artists, or distilling of motifs, but rather the spread of "an exclusionary political economy" (Knapp 1998: 204). At what stage motifs which were once exotic and exclusive become common-place and lose their lustre is interesting to consider too; is this another reason why floral imagery does not continue in the Mycenaean period to the same extent? Why flowers played one of

the key roles within this circle of power, and what their meanings may have been, are questions which are considered in depth in chapters four and five.

Travelling plants

The idea that the plants themselves were travelling around the region is something which has been much less discussed, as the academic spotlight has tended to remain firmly on the movements of artists and ideas. Yet throughout history, living plants have travelled to new countries, as spoils of war, as trade goods, and as gifts. Rulers of the ancient world often made a point of recording whatever new plants they collected as booty; for example, the Egyptian pharaoh Tuthmosis III had the plants he brought back from his Syrian campaigns depicted on the walls at Karnak (Schwaller de Lubicz 1999: 633-638) (fig. 32). Assyrian inscriptions tell of the plants Tiglath Pileser I brought back from his campaigns (Oppenheim 1965: 331), and Hatshepsut's expedition to the land of Punt returned with incense trees, a feat depicted on the walls of her tomb at Deir el-Bahari (Wilkinson 1998: 83-85). The Romans brought many new species to Britain with them, especially fruits and vegetables, like almond, pear, walnut, leek and garlic (Farrar 1998: 143). In this instance, the plants are travelling in the opposite direction to those just mentioned, i.e. with the victors to a conquered land, rather than back home. Pliny the Elder also tells of the plants brought home to Italy from further afield, such as the balsam trees exhibited in Rome as part of the triumph of Vespasian and Titus, adding "it is a remarkable fact that ever since the time of Pompey the Great even trees have figured among the captives in our triumphal processions" (*NH* XII: 111).

With regard to the Aegean Bronze Age, apart from floral motifs being painted in countries where the flowers themselves do not grow, is there any evidence for movement of plants?[27] This idea has not been entertained by scholars, and even a detailed study of organic goods in eastern Mediterranean trade considers only plant products, but not living plants themselves (Knapp 1991). To date, while the investigation of shipwrecks has provided plenty of information about organic cargoes, nothing has been found to suggest living plants were among the goods carried. For example, archaeobotanists have recovered numerous seeds, nuts and fruit fragments from the Late Bronze Age Ulu Burun shipwreck, as well as traces of plants used as dunnage and protective matting, but nothing which indicates a trade in living plants (Haldane 1993). Perhaps further investigation of Bronze Age wrecks around the Mediterranean coast will provide material traces of such a trade. In the absence of physical remains, and without textual references, the

[27] Only living plants, or seeds, cuttings and bulbs intented to grow as plants in other countries, are the subject of this discussion. Plant products, or processed foodstuffs are not considered here.

search must focus on iconography. The main problem which arises from this type of investigation is that of recognition. Plants can be transported in a number of different ways: as seeds, as bulbs, as cuttings, planted in small pots or other holders, and even as small trees in containers. Iconographically, it is only possible to recognise the potential movement of plants when they are obviously growing in a container, whereas seeds, bulbs and cuttings would have been stored away in jars, boxes or baskets for their journey, and so invisible in art. Iconography may not always show the literal truth either, and symbolic scenes need not depict real-life events. To further complicate this search, not every plant in a pot is necessarily going to be transported, as a look around any garden will confirm. It is worth mentioning though that a large number of the most popular plants in Aegean art are bulbous species, and so would have been easy to transport: e.g. lilies, crocuses, irises, squills.

Minoan ceramics rarely show people, and in any of the examples with humans, they are not obviously transporting a plant, although they may be interacting with it in some other way (e.g. fig. 43). Floral motifs on ceramics in general tend to appear as self-contained decoration and not part of a narrative scene, and so there is little chance of ever finding proof of a Mediterranean trade in plants from this quarter. Although possible flower pots have been identified at various Aegean sites and in iconography (see chapter five), this is not proof enough of a cross-Mediterranean horticultural trade. Out of the limited number of frescoes which show human/divine figures interacting with plants (table 2.3), there are no obvious scenes of transportation of plants either, unlike in some Egyptian scenes. For example, the tribute brought from the land of Punt, as depicted on the walls of Rekhmire's tomb at Thebes, includes a a live *ntyw* (resin) tree (Davies 1943: 19; pl. XVII). Here the small tree, in a cradle of rope and perhaps a basket, is slung from a pole between two bearers. A similar method is portrayed in the reliefs commemorating Hatshepsut's expedition to the same country; again a tree is carried whole, with its rootstock intact in a basket (Sherratt 2000: pl. 23) (fig. 33). In the Aegean, there are no pictorial lists of foreign species gained through conquest or exchange either, as on the walls at Karnak. A close look at the flotilla from the West House for signs of ships with a floral cargo, reveals plants only as prow ornaments and as festoons hanging from the masts. One oblique textual reference may indicate Minoans transported trees though. The annals of Tuthmosis III tell of ships of the Keftiu laden with poles, masts and great trees, all destined for Egypt (Wiener 1991: 329), although whether this means living trees or timber is unclear.

Glyptic art may provide some evidence for actual transportation of plants, and in

particular, trees. A ring from Mochlos, in north Crete, shows a boat carrying a tree in a container, which Marinatos has interpreted as the transportation of a sacred tree to a shrine (Marinatos 1993: 163) (fig. 34). Another Cretan example from Makrygialos also shows a boat with a tree on it, this time perhaps identifiable as a palm (Marinatos 1993: 183; fig. 184; Sourvinou-Inwood 1989). Such a small number of scenes is not sufficient to make claims about plants arriving from overseas to the Aegean. Indeed, whether they are coming from overseas or not is once again hard to say, especially as the small scale of the plants makes identification of species difficult. However, if the scenes on the rings do represent actual movement of trees by boat, it must be asked from where were they coming? Only about ten rivers in Crete are currently estimated to flow to the sea all year round, while many other streams are frequently low or empty (Rackham and Moody 1996: 41). During the Bronze Age, there may have been more water flowing across the island, but it is difficult to see many navigable rivers existing. Coupled with the fact that only one lake exists on the island, it seems more plausible that the boat is travelling on the sea, and so could have come from another country, possibly beyond the Aegean. Davaras however pointed out that both rings, and the cup from Mochlos featuring a similar scene, come from coastal contexts, so may reflect movement between coastal shrines (Davaras 2004: 13). However, care must be taken in assuming that such scenes depict reality, or actual events. Another suggestion is that some rings may represent the experience of communication with the divine (Morris 2004). Sourvinou-Inwood prefers to see such scenes as emblematic, as iconographic constructs rather than reality (Sourvinou-Inwood 1989: 98). Yet rituals of tree transport did exist in Egypt and Mesopotamia, so could well have been adopted in the Minoan world too (Davaras 2004: 7). Even if the rings do show "the symbolic transportation of the plant from an area beyond the sea" (Marinatos 1989: 139) rather than an actual event, such scenes could have had some basis in reality originally and so remain significant in the search for plant transport.

Turning to Egypt may provide further evidence for linking travelling plants with the Minoans during the Bronze Age. The land of Keftiu, a place referred to in a number of Egyptian texts, is generally accepted now as Crete (Warren 1995: 8; *contra* Strange 1980 and Wainwright 1914). Textual sources mention a Keftiu-bean, and other references link the Keftiu people to healing (Warren 1995: 7). These Keftiu peoples are also shown in tomb paintings, wearing typical Aegean costume, and bearing a variety of goods as gifts. What is overlooked is that some of these men may be bearing living plants. Six of the Keftiu from the west wall of Rekhmire's tomb are carrying large vessels with plants appearing over the edge

(fig. 35). Davies believed these plants were not living specimens, but rather gold or silver attachments to the vessels' rims (Davies 1943: 20). No such vessels have been archaeologically recovered, although this could be because precious metal vessels will always suffer from plundering. Wachsmann noted the resemblance of some of these vessels to examples found in Shaft Graves III and IV at Mycenae (Wachsmann 1987: 65), which are thought to be of Cretan origin (Davis 1977). Further Aegean features of the tribute vases are considered by Labourg (1990). It is not entirely implausible then that at least some of the vessels may be Minoan products, although it is important to be aware of the use and transference of stock motifs from one scene to another within Egyptian wall-painting.

Examining the plants depicted in (or on) these vessels reveals that three of them show lotus (water lily) buds and/or flowers, a plant native to Egypt. Two others bear rosettes, and a further vessel, also with rosettes, is already resting on a shelf. The final plant-bearer carries in his bowl possible unopened buds, similar to those of the lotus, except drooping down whereas lotus stands erect. This could be intended to represent a different flower, such as mandrake, or it may just be a variation of lotus depiction. The scene of the tribute of the Syrians, from the same location, also includes men bearing bowls with apparent flowers within, as well as three more such items stacked on the shelf already (Davies 1943: pl. XXI). It is far from inconceivable that different nations should present plants, alongside other valuable items, to a foreign noble. For example, two "great trees of nikibtum" (probably the resinous tree *Liquidambar orientalis*) were sent by Subbibulinma of Hatti as a gift to a king of Egypt (Thompson 1924: 142). When Native Americans met with Columbus, not only did they present him with fruit and gifts, but also tobacco leaves. This plant was highly venerated in their society, and so such a presentation was a way of honouring the visitor; unfortunately Columbus did not have the same regard for the tobacco, and had it dumped over the side of the ships (Musgrave and Musgrave 2000: 17). With regard to the Keftiu, Warren writes of the possible importation of lichen from the Aegean to Egypt to aid in mumification (Warren 1995: 7), and there are other references indicating that Crete was a source of useful herbs and plants in the Bronze Age (Sakellarakis and Sakellaraki 1983: 198). A gift of valued living plants may have been as much esteemed as one of a gold vessel or an ivory tusk, or indeed the processed products from that plant.

What precise species these Keftiu plants were is uncertain, as the Egyptian representation of them may be just a stylised plant form, rather than intended to indicate the true appearance of the plants presented. Another possibility is that the

Egyptian artists depicted plants which they were used to painting in Egypt, hence the lotus, lotus buds, and rosettes. It may seem unlikely that Minoans, if they were cultivating water-lilies on Crete, would bring them back to their land of origin, although the plants could have travelled the distance from Crete to Egypt in a pot, as *Nymphaea* are capable of living out of water for some time (Sculthorpe 1967: 3; 90). On the other hand, Wachsmann pointed out that "irrational trade" (e.g. the proverbial coals to Newcastle) can stablise personal relationships despite being pointless in an economic sense (Wachsmann 1987: 118). It may not have mattered that Egyptian plants were presented to pharaoh, the gesture itself was the important thing. A third possible explanation is that whatever the species of plants the Minoans brought, they would have been ones which were esteemed in their native country, and so considered a fitting gift. By showing lotus flowers, a plant which had deeply symbolic meanings in Egypt, the artist may have been trying to indicate that the plants presented by the Keftiu (and Syrians) also had special meaning.

Summary

This section has examined three different explanations for the prevalence of similar floral motifs across the eastern Mediterranean. It is quite likely that a mixture of all of the above occurred in the region during the Late Bronze Age. There is enough textual evidence from the Near East for travelling artisans, at least between the main cities and courts of different rulers, to allow for an analogy of such people moving to and from the Minoan cosmos (Sasson 1968; Zaccagnini 1983). The volume of trade, for which there is all manner of material evidence, would certainly enable the movement of new ideas through word-of-mouth. And it would be surprising if some plants were not also wending their way around the shores of the Aegean and further afield at this time, for a variety of reasons ranging from healing herbs to links with home for foreign princesses. Furthermore, the possibility that it was only an elite stratum of society who participated in this *koine* of flowers seems to fit the data, and has sound basis in analogies from other times and places.

2.6 Suggested Functions of Imagined Plants

In the background of all the different issues dealing with plants in iconography thus far examined is one key question: what is the meaning of this abundance of nature imagery? Suggested reasons for the plant imagery have ranged from ritual to purely decorative, with many variations along the way. The function of Minoan wall-painting in particular has long been debated, although the role of floral motifs on ceramics and other media has gained less attention. This section

considers a sample of the meanings assigned to floral frescoes over the years, and poses further questions which will be taken up in greater detail in the following chapters.

The material

The Bronze Age wall-paintings featuring plants can be sub-divided into different categories, and are tabulated in this thesis as a complete body of material for the first time. Plants appear in frescoes in a number of different ways: as part of human/divine-plant interaction (Table 2.3); as part of a landscape scene, sometimes with animals, but no humans (Table 2.4); and as repetitive decorative motifs on cloth, jewellery or as borders (Table 2.5). There are also numerous plant fragments too small to attribute to any particular type of scene (Table 2.6). While such distinctions are perhaps artificial, they provide a starting point from which to examine the material. Nevertheless, as not all frescoes come from similar contexts, and many are in fragmentary condition, generalisations about function based solely on iconographic content will always run into difficulties. Indeed, this variety of context may be a sign that there is no one unified, meaning for plant motifs, but that they are polyvalent symbols. Another key point is that stylised versions of plant motifs are less common on wall-paintings than on ceramics. A difference between the nature scenes of Thera and Crete has also been noted, where Cretan scenes often are an "orgiastic vegetation of numerous flowers" but Theran ones seem to emphasise one plant (Angelopoulou 2000: 548). While plants do appear on later Mainland frescoes, there is neither the same profusion of nature scenes, nor the same degree of naturalism as is evident on those of the Aegean.

The debate over the meaning of certain scenes or motifs in the Aegean cannot be viewed in isolation, but is part of the greater question about the function of art in Bronze Age society, an issue beyond the scope of this work, but which must be borne in mind nonetheless. Certainly the role of aesthetic appeal should be considered. As Gosden has remarked, "social relations are created and shaped through the aesthetic properties of objects" (Gosden 2001: 163). Frescoes, by their very nature, are attractive to look at, and undoubtedly this formed part of their appeal. Regardless of meaning, an effect of "enchantment" (borrowed from Gell 1992) would be produced upon the viewer. Yet in both Egypt and the Near East during the Bronze Age, art had a deliberate function also: to glorify the ruler and express religious ideas (N. Marinatos 1984b: 31). While the lack of overt ruler imagery is one notable difference between Crete and these societies, it has been assumed that Minoan wall-paintings were the bearers of meaning. This 'meaning' has been hotly debated, but it should be remembered that some art may have

carried multiple meanings, and so to search for 'the answer' becomes redundant. It is also important that the social context within which Minoan art was created and viewed is not forgotten, and that modern concepts of art are not allowed to influence interpretations of the material.

Nature goddesses and religious landscapes?

One school of thought has suggested that Minoan art centred around religious experiences (N. Marinatos 1984b: 32-33). The paintings from room 14 of the villa at Ayia Triadha have been understood in just such terms. They teem with the natural world, each wall featuring a different composition (fig. 36). The south wall is packed with various flowers, including crocuses, papyrus and ivy, as well cats, birds and goats. On the east wall a goddess has been identified, dressed in multicoloured clothes, and looking as if she is dancing amidst flowers. The west wall also features a female, this time kneeling among flowers. While Cameron thought she was gathering flowers to offer to the nearby goddess (Cameron 1975: 174), it has recently been suggested that she kneels before a baetyl (Militello and La Rosa 2000: 991). Similar scenes may have been part of the iconographic programme at a number of Cretan locations. At Amnisos, where large containers holding lilies, irises and other flowers decorated the walls above room 7, Cameron postulated a goddess on the south wall, based on the overall theme of the room (Cameron 1978: 584; pl. 1) (fig. 37). Such a figure is usually featured in reconstructions, although there is no archaeological evidence for her. Some fragments from Epano Zakros also feature the typical Minoan array of plants, as well as pieces of a female costume, suggesting another 'goddess and plants' scene here (Cameron 1975: 234). Recent publication of fragments from the North Building at Knossos indicate another scene including females and plants, as well as a river and architecture, existed there (Warren 2005). Two relief goddesses, one from Pseira (Shaw 1998) and the other Knossos (PM III: fig. 27), may also have been situated in a botanical environment. The goddess receiving offerings of saffron in Xeste 3 should also be mentioned, although she is not surrounded by nature, but only crocus flowers, and is set apart on a platform. All these female figures share elaborate dress and a link with flowers, and have been identified as a specific Minoan pictorial programme: "goddesses in a religious landscape" (Hägg 1985: 213).

Interaction of females and plants occurs also in ceramics. As mentioned previously, humans do not often appear on Aegean Bronze Age pottery. Exceptions to this can be found in two Middle Minoan vessels from Phaistos. A one-handled bowl (F1278) has three figures painted on the inside, suggested as

perhaps two worshippers and a goddess. To one side of the scene, a small triangular flower with visible stigmas or stamens grows inwards from the bowl's rim (fig. 38). The second vessel is a more complex fruitstand, with figural decoration inside the bowl, and around the bowl's exterior, as well as around its flat base (F65 & F786). The interior displays three women, the central figure holding a flower, perhaps a lily, in each hand (fig. 39). Stooping figures move around the outside of the bowl, and have been suggested to be engaged in flower-picking (Schiering 1999: 749) (fig. 40). Schiering suggested that both the bowl and the fruitstand could be seen as vessels to fill with flowers before offering them to a deity, or for some other cultic use (Schiering 1999: 749). Levi believed that the central figure in each scene was a goddess, a Serpent Goddess and a Lily Goddess (Levi 1976: 90; 96). It has been demonstrated however that neither of these figures can be conclusively seen as divine, and such interpretations must be treated with caution (Goodison and Morris 1998: 123).

The existence of a Minoan great goddess was first posited by Evans, who favoured the idea of one divinity with many aspects (PM III: 457). Cameron used the presence of wall-paintings with flora and females to suggest a tradition of worshipping a nature goddess, a "Mistress of the Animals", across Crete. For Cameron, all frescoes centred around the key concept of a festival of rebirth or regeneration, and a goddess whose many forms reflected the diversity yet unity of nature (Cameron 1987: 231; 324). Marinatos assumed also that a nature goddess was part of Minoan religious life, and interpreted the scene on the Phaistos fruitstand as "the goddess announces spring by displaying the flower" (Marinatos 1993: 149). She believes specific plants are selected for use in art because of their symbolic meanings, such as a link of lilies to rebirth in spring, and crocuses to that of the autumn rejuvenation of the land after a hot summer (Marinatos 1993: 195). Hägg thought that the frescoes were unlikely to be actual cult images or scenes of an epiphanic ritual where a priestess 'plays' a goddess, but possibly the Minoans believed that depicting a goddess in appropriate surroundings would ensure her presence in a shrine at her festival (1985: 213-214).

It is obvious that a great deal of attention has been paid to this apparent close link between females and plants, but this should not just be accepted. Although many of the large-scale figures from frescoes are female, males are depicted also, sometimes with plants. The acrobat with palm trees from Tell el-Dab'a and the African with the palm from Akrotiri are two very similar examples (figs. 29-30). Males are present in the Assembly on the Hill scene from the West House, where various plants and trees dot the landscape, and in the Sacred Grove fresco, where

olive trees are featured. The miniature fresco from Tylissos shows a male approaching a bush (fig. 41), and the Lily Prince not only wears a garland of eponymous flowers, but is standing in a reed/papyrus landscape (fig. 42).

Turning to ceramics, the Middle Cycladic 'Tarzan' sherd from Akrotiri features a male head and a large flower in close proximity (fig. 43). A small jug from Phaistos (F1452) depicts a rudimentary human figure with upraised arms, quite possibly a male, as the dresses or robes considered as female attributes in Minoan art are absent. This figure is dwarfed by a large plant, perhaps reminiscent of a lotus (fig. 44). In fact, even the gender of those figures bending low around the side of the Phaistos fruitstand is unclear, and they could just as likely be men as women. In this context, it is also worth mentioning the LM II vessel from the Unexplored Mansion, decorated with a male in a floral landscape (Popham 1984: 169; pl. 153.7), as one further example of human-plant interaction in Minoan ceramics (fig. 45). Close parallels for such interaction come from glyptic art. Neopalatial rings often portray elaborately dressed females, again in association with floral motifs. For example, the Isopata ring shows several flowers dotted around the protagonists (fig. 46). But gold rings can also include males in scenes with plants and trees, often side by side with females. The Archanes ring shows a male pulling at a tree, and an example from Sellopoulo features a male beneath a tree (figs. 47-48).

Hence, although there is not perhaps the same quantity of 'male and flower' scenes as there are female, they do exist, and so it cannot be stated that it is the privilege of females only to interact with nature. The status of the males does, however, seem to be different to that of the females. Men often make up part of a crowd, rather than being the main protagonists, and no male figures have been found which could be suggested to be a nature divinity, unlike the elaborately-dressed females on frescoes and rings. While it is incorrect then to assume flowers and plants are the sole preserve of females, it does seem that there is a difference in the manner of representation of men with plants compared to females. One suggestion is that males appear in connection with trees more often than with flowers, while females appear with flowers like lilies and crocuses more frequently. A further interesting point to emerge from the material is that while human-plant interaction on ceramics is not limited to females, all those vessels which feature humans all also feature plants. It seems plausible to see the manipulation of flowers and plants as a key part of Minoan ritual, which is therefore depicted in a variety of scenes on different media.

Decoration or differentiation?

While the above discussion considers artefacts with floral-human imagery as having some form of ritual function, other readings are also possible. Early writings on many of the nature frescoes saw them as delightful room decoration (Chapin 2004: 53; n.36). In particular, where the scene is that of pure landscape, such as the Birds and Monkeys fresco from House of the Frescoes, or the Floral Fresco from the Unexplored Mansion (fig. 49), the lack of human/divine participants or architecture permits non-ritual explanations. Evans thought that "the individual taste of the owner of the House of the Frescoes happened to turn rather to the flowery meads and creeper-hung rocks of his native countryside" (PM II.2: 466). Chapin summed up the debate: "Is a landscape secular or religious in meaning? Is it just fancy wall decoration, or does it signal the presence of a religious shrine?" (Chapin 2004: 9). This is the problem with which Aegean archaeologists have been grappling for over a century, compounded by the fact that not all landscapes come from similar architectural contexts, feature similar plants, or had similar artefacts found associated with them.

While not excluding a religious function for some of the landscape paintings, it is important to look beyond this as the sole reason for their existence. One other suggestion is that frescoes served to reinforce the position of elites within Minoan society (Chapin 2004: 61). Frescoes, by their very nature, can be viewed as a luxury item, and so to own one may be a way of showing off wealth and status (Chapin 1997: 23). An innovative design, such as the 'new' flowers found in the Floral Fresco from the Unexplored Mansion, would perhaps add further to the effect (Chapin 1997:23). Hägg has stressed that the Minoan artist was probably not free to express his/her own ideas but had to paint that which was commissioned by patrons (Hägg 1985: 209). A request for innovative flowers may have been an attempt to be a 'trend-setter', or to own paintings which were different than the norm, and so counted as a form of exotic goods. Apart from the frescoes being situated in buildings that are marked out as different through their size, building materials and contents, gaining access to any of the landscape scenes involves entering a building, often going upstairs, and then being admitted to the correct room (Chapin 2004: 59-60). Access to such images is therefore strictly controlled, and many of the inhabitants of Minoan Crete could not have regularly viewed such paintings. Any competitive displays of wealth using frescoes must therefore have been mainly aimed at those who would have had regular access to the image, presumably people of similar social standing. Display does not have to always be competitive though, and Chapin explores the notion that the psychological effect on a non-elite Minoan of viewing such lush scenes would be

to experience awe both at the "powerful presence of divinity in nature" and at the ability of the elite to provide a physical expression of such power (Chapin 2004: 61). The close relationship between the elite and the gods, perhaps especially the nature goddess, would have thus been underlined, and so reinforced existing social distinctions (Chapin 2004: 61).

Linked in with using landscapes to reinforce social distinctions is the hypothesis that display of foreign plants indicates a knowledge of foreign regions. For a common language of motifs to arise across the eastern Mediterranean, of which plants are a key component, communication between people at the sites of paintings can be assumed. As Knapp has commented, it is possible to see in the numerous frescoes "a restricted visual vocabulary that also embodies social forms of knowledge and power" (Knapp 1998: 202). It seems probable that the elite used a visual repertoire, replete with exotic flora and fauna, to demonstrate their knowledge of overseas regions. Whether they were competing amongst themselves, emulating each other, intimidating the lower classes with such displays, or a combination of all these motives, the practice has led to an array of frescoes demonstrating that plants are a valuable tool in construction of status.

2.7 Final Comments

Before moving on to explore the Minoan floral world from new aspects, it is important to understand the contemporary state of scholarship on Minoan iconography and the context out of which such work has arisen. One key point which emerged in this chapter was the difficulty identifying many of the species in Minoan art. Undoubtedly some are identifiable (lily, crocus, palm), but the confusion which arises over other instances should guide investigators towards considering that perhaps it is not always the precise species which mattered. With this idea in mind, a different way of understanding the Minoan nature-view is examined in the following chapter. The concept of naturalism within Minoan art is a particularly relevant issue when dealing with plants. While such extremes as 'everything is based on observing nature' and 'everything derives from abstract patterns' are unsatisfactory, that a scale of realism within the depictions can be traced is a valid conclusion. Hybridisation is a related matter, and while it is interesting to try and trace which flowers make up unfamiliar motifs, the intent behind the procedure ought to be of greater concern. Were there deliberate messages lying within these 'new' plants, or were they just artistic experiments?

Investigating the cultivation of species of non-food crops leads to exploring deeper issues. If such species were cultivated, why and where are the two

questions which must be answered. The 'where' issue is dealt with in chapter five, when evidence for Minoan gardens is examined. The 'why' question is one which is underlies much of this thesis - why do people want to cultivate plants, especially non-native ones? However, although non-native species may be shown in art, this does not mean that they had to be cultivated in that region. Palms could certainly have grown in the Aegean, but on the other hand, this could be an example of iconographic transfer or of artists moving around the eastern Mediterranean. The idea that the plants themselves moved to new countries was suggested for the first time here, and while proof of this practice in the Bronze Age is not obvious, it is important to be aware of the desirability of exotic plants and the relative ease with which they can be transported. This issue is returned to in chapter five.

The issue of the function of wall-painting has received more attention than any other question about Minoan life. The proportion of landscapes and floral scenes within this corpus is quite high, and functions ranging from attractive room decoration to sacred settings for a nature goddess have been offered by scholars. The problem encountered when making such hypotheses is that landscape motifs can be found in both palatial contexts and houses, in rooms with ritual objects and rooms without. Generalisations and conclusions are further complicated when modern concepts of 'sacred' or 'profane' are not necessarily appropriate for the material. Moreover, do all landscape scenes even have to have a similar meaning? It can be suggested that using such black and white categories as 'sacred' or 'decorative' prevents archaeologists from exploring other ways of being and of representing a worldview which may be more appropriate to a Minoan ontology. While the number of examples of plants in iconography from around the eastern Mediterranean seems to grow on a yearly basis, understanding the meanings behind such a *koine* has remained just out of reach using traditional archaeological methods. The following chapter takes a fresh look at the evidence using ethnobotanical methodology.

Chapter 3: Ethnobotany: A New Direction?

> "If the forest Indians proved unable to preserve their civilization in the form which we saw in the Andes, it was because of the forest itself, which offers man nothing but wood, sand and mud." (Flornoy 1953: 204)

> "With the aid of digging sticks of chonta wood, the women first plant manioc cuttings all over their plots, then distribute in apparent disorder yams, sweet potatoes, taroes, beans, squashes, groundnuts and pineapples. All that then remains to be done is to plant the trees whose seasonal fruits help to vary the somewhat monotonous everyday diet: chonta palms, avocado trees, sweetsop trees, caïmitos, ingas, cocoa trees and guava trees. .... Here also are the plants that are used communally by one and all: pimento, tobacco, cotton, bushes of clibadium and lonchocarpus - the juices of which asphyxiate fish caught with poison - gourd plants, rocou and genipa for face-painting and, last but not least, herbal remedies and narcotic plants such as stramonium." (Descola 1997: 85)

Comparison of the above quotations, both relating to the Jivaro (Achuar) of Ecuadorian Amazonia, underlines how far the understanding of the possibilities of human-plant interaction has come in fifty years. Where Flornoy saw a society hampered from development by the surrounding forest, Descola realised the nature of the interdependence of the people and the plants within the same landscape. Minoan studies have often seemed frustratingly trapped in the 'Flornoy camp'. This chapter explores a new methodology for attaining a better understanding of the variety of uses of plants, and the kinds of relationships with them which may be appropriate for a Bronze Age Aegean society.

3.1 A History of Human Relations with Plants

Before considering how the issue of human-plant relationships in the Bronze Age can be moved forward, it is important to understand how modern scholarship has arrived at its current position *vis-à-vis* the plant world in general. This section therefore looks backwards to examine how humans have considered the plant world since the classical era. Its focus is on the milieu of Western scholarship, as that is the background out of which Minoan archaeology was born, as well as the tradition of botany which has informed studies of Minoan plants.

Ancient authors

Information on the world of plants can be found in many of the texts of ancient Greece and Rome. For example, Herodotus, writing in the fifth century BC, described the Babylonian method of growing date palms (*Hdt.* I: 193). While Herodotus did not have a study of the vegetable kingdom as his main objective,

there were other writers who focused specifically on plants. Theophrastus (370-287 BC), a student of Aristotle, wrote two such works known as *Enquiry into Plants* (*Hist. pl.*), and *Causes of Plants*, (*Caus. pl.*). Often seen as the father of botany, he studied the morphology, classification, economic botany, and problems of the growth and reproduction of plants, including foreign species sent back by Alexander the Great from his eastern campaigns (Morton 1981: 32). It has been suggested that his systematic enquiry was stimulated by the imperialism of Athens; there was a need to develop agricultural productivity, to learn about colonial plant resources, to investigate shipbuilding materials, and produce charcoal for metallurgy (Morton 1981: 29). Indeed, this link between plants and empire is considered in greater detail in chapter five. None of Aristotle's texts on plants survive, although a Pseudo-Aristotle *De Plantis* was thought for centuries to be his work. However, he did have a garden at the Lyceum containing around 450 species of plant, which Theophrastus inherited (Baker 1970: 20). In books XII to XXVII of the *Natural History*, Pliny the Elder recorded "a medley of facts and details, taken from both his written sources and from current oral traditions, meshed with inaccuracies resulting from rapid reading and recording and an occasional blind eye to the ridiculous in his sources" (Scarborough 1986: 63). Here trees, plants, herbs, medicines and myths were all reported. Other Roman writers focused on agricultural practice, so the works of Cato, Varro and Columella are filled with detailed descriptions of farming and horticulture. Whether all these works are now classified as botany, pharmacy, philosophy or history, they show that in Europe scholars have been observing and commenting on the links between the natural world and mankind, and have been fascinated by the diverse range of uses to which plants have been put from a very early time.

Medical botany

Due to widespread distribution, ease of identification, and simplicity of preparation, botanical material was by far the main source of medicine for the ancients (Stannard 1961: 499), and indeed still is the mainstay of many pharmacopoeia around the world. Medicinal uses of plants were an important stimulant leading to many written treatises on the subject, and the medical element of botany came to be the most highly valued form of plant knowledge (McCarthy and Sherwood-Smith 2000: 13). The Hippocratic Corpus is a rich source of such information, and Dioscorides's *De Materia Medica* (*c.*64 AD), which focused on medicinal uses of some 500 plants, was the standard text for doctors until the Renaissance. While the works of Pliny the Elder, Hippocrates and Dioscorides relied for information on lost earlier texts, such as Krateuas or Sextius Niger, that any classical texts at all survived is due in no small part to the work of the monks

of the Middle Ages, who copied the manuscripts. Some monasteries even specialised in medical texts (Morton 1981: 87). The lists of plants in Byzantine encyclopedias and lexica also contributed to the eventual transmission of Greek botany to the West, as well as eastwards to Islam (Stannard 1971: 168). Moreover, while Europe plunged into the Dark Ages, Arabic scholarship became a repository for botanical knowledge, with prosperous rulers encouraging scientific research, including much of a pharmacological nature (Morton 1981: 88), as well as great works on botanical lexicography like that of Al-Asma`i (Fahd 1996: 814). It would be centuries before such detailed knowledge once again emerged in Europe, and when it did, it was from the East that it returned.

Of course, writing about plants has been not restricted to Europe. The earliest known herbal (an illustrated text focusing on uses of plants in healing) comes from China, the *Pen Tsao* compiled by the emperor Shen Nang some time before 2000 BC (Balick and Cox 1996: 13). China had a great tradition of botanical studies, and the imperial court retained a number of experts on pharmacology from very early times (Morton 1981: 60). In contrast to the West however, Chinese botany did not suffer a decline; horticultural encyclopedias were being produced during the tenth century Song dynasty, and monographs on single flowers, like the chrysanthemum or orchid, can be found from the early 12th century (Goody 1993: 352). Moreover, at least one new work on pharmaceutical botany was produced in China every century between AD 100 to AD 1700 (Morton 1981: 60). In India, the *Susruta-Samhita* of the 4th century BC, a collection of 700 plants named and organised into thirty-seven groups according to the condition to be treated, is another example of plants being studied for medicinal purposes. Ancient Egypt has left behind medical papyri, detailing plants (amongst other materials) used for curing illness, the most famous of these being the *Ebers Papyrus*, dating from about 1555 BC. Cuneiform tablets contain large amounts of information on Assyrian medicine, mentioning at least 250 vegetable drugs (Thompson 1924: iii). From the New World, a herbal originally written in Nahuatl, the language of the Aztecs, dates from 1552. Authored by Martín de la Cruz, an Aztec physician at Tlaltelolco, and known now as the *Badianus Manuscript*, after its Latin translator, it details 184 plants and trees which were used by the Aztecs for healing (Foster 1992: 14). To cite one further example, the Tibetan *Four Tantras*, the basis of all Tibetan medical knowledge, are traditionally illustrated with *thangkas* (paintings) of the plants utilised (Fallarino 1994) (fig. 50). Thus it can be seen that the practice of listing, studying and depicting medicinal plants has a long and widespread history.

The flowering of botany

While Singer's statement that "even the herbal works of Dioskurides, Galen and Oribasios were too difficult for the wilting mind of the Dark Ages" may be hyperbole (1927: 31), it is true that during this period in Europe much of the botanical knowledge gained through the studies of the ancients became lost or forgotten. The few surviving works of the classical authors were highly esteemed in Europe until well into the Renaissance, and to differ from their opinions was seen as presumptuous, leading to a "stagnation of botany" (Hufford 1978: 76). This situation may have led to the supposed scenario whereby plant-lore descended into folk-remedies, charlatans posed as doctors, and witches were regarded with suspicion by all (McCarthy and Sherwood-Smith 2000: 5). Such an attitude of suspicion towards plant knowledge was fostered by Christianity, and by the mid-13th century, practising 'witchcraft' was a heretical act punishable by death. This effectively targeted women who were often the traditional healers, opening the way for male, university-educated doctors to take over medicine and studies of plants in general (Cotton 1996: 344). While many may privately have agreed with Culpeper, who noted "Just so do the colledge of Physitians lie at home, and domineer, and suck out the sweetness of other mens Labours and Studies, themselves being as ignorant in the Knowledge of Herbs as a Child of four years old" (McCarthy and Sherwood-Smith 2000: 27), the effect this had on herbal knowledge was to reduce dramatically the traditional oral plant lore being passed on, often through female lines, even if it did not totally stamp it out.

Of the comparatively few texts which survive from the post-Classical period, Hildegard of Bingen is useful for her comments on medicinal plants, while the medical poetry of Benedictus Crispus provides an interesting glimpse of 8th century Western medical ideas (Stannard 1966: 29). The popularity of what Arber terms "astrological botany" also contributed to the dubious nature of much contemporary plant knowledge (Arber 1938: 262). For example, Thurneisser's advice on planting and gathering herbs states that "it is absolutely essential that these operations should be performed so as to correspond with the stations and positions of the planets and heavenly bodies, to whose control diseases are properly subject." (Arber 1938: 260-261). While links between botany and the signs of the Zodiac are generally not considered by today's doctors, both the time of day, as well as the phase of the plant's growth cycle at which it is harvested for medical use, can affect the quality of medicine obtained from the sample.

The careful, scientific study of plants was reborn during the Renaissance, and Padua offered the world's first chair in Botany in 1533, albeit still under the aegis

of medicine (Morton 1981: 120). The voyages of discovery being launched in the same era meant that the huge variety of the world's flora became evident, and in less than one hundred years more than twenty times as many plants were introduced to Europe as in the preceding two thousand years (Morton 1981: 118). The Spanish conquistadors and the missionaries who followed them made observations on the array of new flora found across the Atlantic ocean (Cotton 1996: 4). Botanic gardens were established, first in Padua, followed by Leyden, Montpellier and Oxford, to name but a few (Goody 1993: 103). The renewed interest of the Renaissance in the classical past also meant that authors such as Theophrastus, now translated into Latin, were rediscovered (Morton 1981: 100). Indeed, the acceptance of Latin as a common tongue for scholarship allowed scholars from different countries to communicate (Atran 1990: 134). Combined with advances in preservation techniques for plants, leading to the development of herbaria, botanists could now share not just their texts but their plant specimens too.

Following on from the early, relatively unsystematic discoveries, the age of true scientific exploration thus dawned, and voyages set out with the express aim of studying the vegetation, along with animals, people, and geology of the New World. By the nineteenth century, the British government had been persuaded that a naturalist should go on all voyages to new lands (Morton 1981: 407). A well-known example of this practice is the presence of Charles Darwin on the journeys of the Beagle in the 1830s. In fact, from the 17th century, the history of botany can be seen as a series of one breakthrough after another in the knowledge of plants. For example, in the 1640s experiments in plant nutrition began; in 1682 the idea that plants reproduced sexually was publicly aired; the 18th century brought advances in agricultural techniques, and the classification system of Linnaeus; advances in scientific technique led to studies of pollination, of photosynthesis, of the cellular structure of plants, and of plant evolution (via Darwinian theories), bringing botany up to present-day concerns of biochemistry, ecology and genetics (Morton 1981).

Plant illustration

Hand-in-hand with the scholarly considerations of the plant world, the illustration of plants has also developed.[28] It was noted in chapter two that Evans and his contemporaries had no qualms in identifying the plants depicted on the walls and pots of Knossos and other Minoan sites. It is worth enquiring why this urge to

[28] For reasons of space, this section does not deal with plant illustration on ceramics, textiles or furniture, but focuses on book illustration and painting. Examples of the diverse contexts of botanical illustration can be found in Moore and Garibaldi (eds.) 2003.

identify each plant exists; why is it expected that each image is an intended representation of a real specimen? This assumption underlies much of the iconographic analysis of Bronze Age material, yet has rarely been investigated. It is surely essential to see where such attitudes come from, and how they inevitably colour modern understanding of floral art. Such an exploration will remain relatively brief, but nevertheless will allow a deeper appreciation of why the temptation to label Minoan plants is so strong.

It appears that this assumption of accuracy for Minoan floral motifs was born out of the long tradition in the west of portraying plants in a relatively true-to-life fashion. Flowers and trees which are shown in the frescoes of the Roman period, while sometimes simplified beyond recognition, can often be identified, e.g. those found at the House of Livia at Primaporta (Farrar 1998: 143-145) (fig. 51). While it is thought more likely that such scenes represent an idealised garden rather than a portrait of a real one, the species included are ones which were all found growing in Roman gardens at that time. Covering walls with garden paintings was a way for the owner to transform the (sometimes limited) space into a virtual garden, and enhance his prestige (Carroll 2003: 104). Further afield, the plants depicted on Egyptian walls tended to be accurate representations, as some plants had key symbolic significance and because they were intended to live forever on tomb walls should be as realistic as possible (Wilkinson 1998: 4). Thus two ancient societies which had links with Greece at various stages and which played formative roles in Western archaeological thought were seen to have an artistic tradition of realistic portrayal of plants.

Deliberately accurate renditions of plants also occur in the earliest of the herbals. Naturally such books, intended to aid recognition of plants for healing, attempted to be relatively faithful to the real plant. While Pliny the Elder mentions that Krateuas and others "painted likenesses of the plants and then wrote under them their properties" (*NH* XXV, 4), the earliest surviving illustrated herbal is a copy of Dioscorides from AD 512 (Arber 1938: 8).[29] Somewhat surprisingly however, the story of plant illustration does not travel in a linear progression from early poor quality images towards a high standard of illustration, but rather starts off relatively accurately and then diminishes until the sixteenth century (Arber 1938: 185). Early paintings continue the tradition of veracity which was found in much of the art of the Roman period, thus a painting of a *Ferula* from the Codex Vindobanensis is relatively lifelike (fig. 52). However, for the next millennium, herbal artists rarely consulted nature for their pictures, preferring to base them on those from previous volumes, inevitably resulting in a decline in verisimilitude.

[29] Now in Vienna: Codex Vindobanensis Med. Gr. 1.

The rise of the technique of woodcutting for illustrations also led to a loss of detail in the pictures, which was not to be remedied until copperplate etchings became the norm at the end of the sixteenth century (Arber 1938: 194; 241). A third factor in this loss of accuracy was the herbals' habit of recording folk-wisdom and myths, leading to numerous illustrations of fanciful plants (Saunders 1995: 18; 32). For example, a woodcut of a narcissus includes human heads for flowers, reflecting the classical myth of the metamorphosis of Narcissus into a flower of that name, but is of little help in recognising an actual flower (fig. 53). Finally, artists had a desire to present pleasingly symmetrical pictures of plants, hence numerous cosmetic 'improvements' were painted in on an aesthetically unpleasing flower (Arber 1938: 198).

Such was the situation in the sixteenth century, when the publication of Brunfel's *Herbarium Vivae Eicones* (1530) changed the way plants were to be depicted. As expected with a such title, "Living Portraits of Plants", the specimens were depicted exactly as they were in real life once more, even down to blemishes on the leaves (Saunders 1995: 20; Arber 1938: 55). Weiditz, the artist for the herbal, had been a pupil of Albrecht Dürer, who himself had experimented with highly accurate, almost scientific, plant pictures (Saunders 1995: 206). Hand in hand with this return to drawing from nature, was the concept of showing plants in a habitat, as opposed to the lone, out of context, specimens which filled the pages of herbals (Arber 1938: 204). Seasonal differences also began to be shown, for example in the 1542 *De Historia Stirpium* of Fuchs (Saunders 1995: 22). The invention of the printing press in this century allowed wider access to published works, and herbals benefitted from this extended readership. Magnificent works by Brunfels, Fuchs, Gesner, and Bauhin were at the forefront of this new publishing phenomenon. In 1597 the most famous of all herbals, that of John Gerard, was published, and is still available today.

Other forms of illustrated manuscript from the medieval period also had quite precise pictures of flowers included. Whether in Books of Hours, prayer books whose rich illustration often included flowers symbolically important to Christians, or on royal crests, the depiction of plants was in a manner allowing them to be identified, and therefore permitting the symbolic message to be decoded by the viewer (Fisher 2004: 14-16). Intertwining plants clambered up the sides of pages, and formed ornate borders, inspired by the species growing in ornamental gardens, kitchen gardens and even physick gardens (fig. 54). It is even possible to trace the arrival of foreign species to new countries, as they start to crop up in these manuscript paintings in ever more realistic detail, although

always subsidiary to the accompanying Word of God.

The age of exploration brought many new and exotic species back to Europe, and a further dependence on plant drawings emerged; not all the actual living plants could survive the long sea voyages, and so the only way they could be discussed by scholars was through their illustration (Saunders 1995: 65). Florilegia showcasing colourful new species dominated the seventeenth century, and images of elegant flowers cultivated in actual gardens (of the upper classes) again demanded accuracy in representation (Saunders 1995: 44). From here, it became natural to represent plants in ways leading to their easy identification, and as scientific classification of the natural world advanced, plants were subjected to ever more anatomical depictions, with the sexual organs and fruits playing key roles (Saunders 1995: 88-89). Today, it is even possible to depict a plant's cellular structure, and photography, microscopes and computers have all led to ever more detailed images of the plant world.

This then is the tradition out of which the western world looks at plants in art. Increasing reliance on accuracy in the pictures, whether to aid identification of healing flora, deliver a religious message, add to scientific debate, or enhance prestige of owners, has led to a state where now the viewer expects a specific species to be intended. Pictures of plants are traditionally made to be understood by a viewer, although an exception may be in some modern art, where precise species are subsumed into general floral arrangements or are deliberately fantastical, such as certain works by Picasso or Dali. Add this to the Western belief that it is now practically a preordained right to know everything about the world of nature, and it is no surprise that the naming of plants in pictures should come so easily to a modern viewer. A contrast should be noted however, in that such realism in floral depiction is not common to all societies. Reichel-Dolmatoff felt unable to interpret the motifs used in Tukano art, some of which represented plants (1978: 29). Figure 55 shows a picture including the ritually important yajé flowers. To a Western observer, such schematic flowers cannot be understood, except as a basic floral motif, yet to a Tukano, the flower is easily identifiable, and its importance and meaning within the scene instantly grasped. Furthermore, artistic conventions may mean that where a plant is not realistically shown, a key element of it may be exaggerated. Hence in Aztec depictions of plants, "el artista pondrá el énfasis en la parte de la planta cuyo valor estimativo es considerado esencial y calificativo. El predominio de uno o más de estos factores determinantes establece el rasgo que permite identificar al mismo vegetal en cualquier contexto donde haya sido representado." (Lozoya 1983: 168). Distortions of reality occur,

yet within the relevant society, the meanings are clearly understood.

What are the implications for interpretations of Minoan depictions of plants arising out of this overview of botanical illustration? Obviously, in the Bronze Age pictures, plants tend to be just similar enough to Western concepts of flowers that interpretation can be attempted. Indeed, plants are often depicted in a fashion similar to that which came to be the norm for identifying species in the West, i.e. their sexual organs play a prominent part. Lilies and crocuses, sea-lilies/papyrus and irises, all proudly display their stamens, stigmas and styles, thus unconsciously appealing to the trained mind of the modern Western botanist, or amateur flower-lover, who then overlooks the fact that the numbers of such elements do not match those on real flowers. Considering how unrealistically plants can be depicted, it should perhaps be understood that Minoan artists often did intend to represent a specific one. Perhaps the exaggerated attention to certain motifs, or their repetition, or the attention to specific details allows a glimpse of what plants or parts of them were valued. The emphasis on the crocus stigmas, for example, is thought to reflect that saffron was the important part of the plant. But is it conceivable that the many instances where plants have slipped into 'generic representation' is in fact a reflection of an artistic shorthand, where for example, a "marguerite" image was understood as a symbol for a more specific plant and its relevant cultural associations? Understanding both the long Western tradition of realism associated with floral art and the fact that different cultures have different symbolic languages allows the assumption that real species were *always* intended by Bronze Age motifs to be queried.

3.2 Ethnobotany

The history of academic and popular knowledge of plants, as outlined above, is really a broad mixture of botany, philosophy and medicine, with a dash of exploration and conquest thrown in. This section narrows the focus and concentrates on the study of the interaction between people and plants within their cultural context. How are such issues studied today? To what extent is it possible to examine them successfully for past societies? Ethnobotany provides a methodology for elucidating such information, enabling an understanding of the diversity of attitudes to the plant world, and is a new tool with which to examine such issues with respect to the Minoans.

History and methodology of ethnobotany

Ever since the term was first coined in 1875, the precise definition of 'ethnobotany' has been continuously changing (Ford 1994: viii). Today, ethnobotany can be

succinctly described as the analysis of indigenous manipulations of plant materials and their cultural context (Balick and Cox 1996: 3).[30] Yet the focus of the subject has been shifting constantly and ethnobotany could now be considered more an umbrella term to cover diverse branches of studies such as ethnoecology, traditional agriculture, phytochemistry, palaeoethnobotany, material culture studies, and cognitive ethnobotany. Archaeologists in general however, are not overly familiar with the term or indeed aware of the practice of ethnobotany. As scientific methods have advanced, allowing ever more exact analysis of seeds, phytoliths, and plant DNA, the people who originally utilised these plants have faded from view. Yet in trying to understand the different roles and meanings of plants in past societies, it is perhaps to ethnobotany that archaeologists should be turning in the search for answers.

A summary of the history of the discipline shows how different goals have guided its growth, and underline the contrast between the issues with which ethnobotany sees itself capable of dealing, and those which archaeologists consider when using palaeobotanical data, as discussed in chapter one. Supposedly it was towards the end of the nineteenth century that plant studies moved away from looking solely at the economic importance of plants (as was essential in empire-building, which was a main concern of many countries at that time), and concentrating instead on their cultural significance (Cotton 1996: 7). The year 1900 saw the publication of the first doctoral dissertation in the discipline now recognised as ethnobotany,[31] and so the study of interrelations between people and plants was 'officially' born (Cotton 1996: 7). Since then different themes have emerged, riding waves of popularity, before being overtaken by the next 'in' topic. So plants have been studied as a gateway into primitive linguistics and classification, as a basis for understanding human cognition (Cotton 1996: 8), and, of course, the search for new pharmaceutical products is ongoing. Indeed in 1989, Shaman Pharmaceuticals was established to search for new therapies based on ethnobotanical information. Recent investigations into the plant world have been with a mind to preserve germplasm and environment before much of the diversity of the world's flora

[30] The definition of 'indigenous' has been a fluid one for years, but according to the 1986 Special Rapporteur of the UN Economic and Social Council Sub-Commission of Prevention of Discrimination and Protection of Minorities, it is as follows: "Indigenous communities, peoples and nations are those which, having an historical continuity with pre-invasion and pre-colonial societies that have developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems." (Posey 2002: 3, n.2).

[31] David Barrows, *The Ethnobotany of the Coahuilla Indians of Southern California*, University of Chicago.

disappears (Ford 1994: xvi). Ethnobotany, therefore, is currently thriving, a fact demonstrated by the number of annual conferences addressing relevant topics, as well as the publication of several journals devoted to the spread of ethnobotanical information, most notably *Economic Botany, Journal of Ethnobiology,* and *Journal of Ethnopharmacology.*

Any ethnobotanical enquiry is dependent on the same few core methodologies (Cotton 1996: 91-124). The starting point for most projects is anthropological fieldwork, including interviews, observation and/or participation, questionnaires and statistical data collection. A linguistic analysis can reveal clues about plant classification (ethnotaxonomy), and often a study of the myths of the society will also shed light on the roles of some plants therein. Ethnobotanists also collect specimens, and scientifically identify the plants used by the culture, as well as visiting any markets to note which species have a commercial role. Sometimes palaeobotanical methods are called for, and sampling and analysis of plant remains left by previous inhabitants of the region can be carried out. There is also room for more specialist disciplines, such as pharmacological assays, examination of art, and community law. Not surprisingly therefore, ethnobotany has always been carried out in living societies. It is obviously impossible to interview or observe people if they are no longer actually alive, so does this mean that ethnobotany must founder when applied to societies that are no longer extant? The following section takes some of these key methodologies, and considers whether they can be adapted for application to a society from the past, in this case, the Minoans. Categories of evidence discussed here are words, myths, plant specimens, and art. In particular, words are focused on as a potentially greater source of information about Bronze Age plants than has been thus far acknowledged.

Ethnobotanical methodology and the Aegean Bronze Age: words.

When dealing with the Aegean Bronze Age, one of the main sources of ethnobotanical information - people - are no longer available for comment, but is this the obstacle that it seems at first glance? Residency among non-Western communities while examining their society, including their use of plants, became the basis for anthropological enquiry in the twentieth century, leading to many monographs on individual cultures.[32] While firsthand testimony is certainly invaluable, it can also cause problems. Although interviews are designed to be as objective as possible, informants may misunderstand questions, or be led to give

[32] Malinowski's 1922 *The Argonauts of the Western Pacific* is acknowledged to be the first anthropological study carried out using the technique of participant observation, i.e. where the observer is immersed in and participates totally in the culture being studied.

certain answers, or give the answers they believe the enquirer wants. There are apocryphal stories of ethnobotanists publishing the local dialect for "I don't know" or "plant" as a species-specific name (Cunningham 2001: 19). As plant knowledge is so often gender-related, the gender of either investigator or interviewee will affect the information given also. So too will the informant's role within society; healers may know a wider, or simply different, range of plants to hunters or farmers. Similarly, for plants that are considered sacred or taboo, information may not be forthcoming at all. There may be multiple names for the same species; often there will be diverse answers from different interviewees, all helping to further confuse the eager ethnobotanist. So while oral testimonies are undoubtedly a key resource, they must be used with great care.

Accompanying face-to-face interviews, written records can be equally valuable. This is where it becomes possible to approach attitudes to plants in societies of the past. For example, ancient Egypt has bequeathed to the archaeologist a huge number of papyri and tomb paintings. It is possible to learn about the importance of specific plants from these traces. The Papyrus of Ani, or Book of the Dead, (c. 1500-1350 BC.) tells of the mysteries of Osiris as related to magic and the sacred blue water lily (Emboden 1981: 48). Scripts in the Near East also provide lists of plants used in healing, or sacred ceremonies (Thompson 1949; 1924). Linked to this study of written evidence is a chance to analyse linguistically the names of the plants. Often the uses or characteristics deemed important by a society are reflected in the name of the plant (Cotton 1996: 112). An example shows how such ethnobiological nomenclature works. Among the Waimiri Atroari Indians of Brazil, plant names fall into three categories: those comparing or relating a plant with an animal, such as *wiamy iemry* or "tortoise's penis" (*Callichlamys latifolia*); those describing physical characteristics, like *xuia pyny kiriri* or "yellow-wood vine" (*Abutu sandwithiana*); and those describing the plant's uses, *mare iepry*, or the "sieve tree" (*Sorocea guilleminiana*) (Milliken *et al.* 1992: 18). Names that elucidate the use of a plant are especially interesting to ethnobotanists. Furthermore, plants which are important in a society are less prone to linguistic variation in their names whereas those not so frequently utilised may be called many things by different people (Berlin 1992: 204; Brown 1985: 51). A standard name may indicate a plant has standard importance across a wide geographical range while numerous names suggest non-continuity of knowledge about the species. If a plant's name is of non-native origin, it can indicate that the plant itself is non-native, but was brought to the culture at some stage in its history. This too is of interest to the ethnobotanist, and can provide clues to a history of plant travel which may otherwise be buried in the past.

When turning to the Aegean Bronze Age, using words as a source of information about plants becomes more difficult. Unlike in Egypt and the Near East, the Minoans did not leave an extensive literature. Early Cretan hieroglyphic script, used from c. 2000 BC into the palatial period, is poorly understood and poorly preserved (Packard 1974: 20). Some hieroglyphic signs are similar to those in Linear A, the script of the Minoan Neopalatial period (Chadwick 1958). Although Linear A also remains undeciphered to this day, there are a number of signs common to it and Linear B, the script of the Mycenaeans, permitting plausible attempts to understand the earlier records (Packard 1974: 26). Linear B served to record the administration and economic life of palatial centres of the Late Bronze Age, rather than preserving a literature. The receipt and disbursement of commodities ranging from chariot parts to textiles to livestock is carefully inscribed in clay. From such lists, information can be gleaned about the types of plants which were deemed important enough to be controlled in some way by the palaces.

Of course, a key point about the Linear B archives is that they date from the Mycenaean period, and most of the tablets are found on the Greek Mainland, at Pylos, Mycenae, Thebes and Tiryns, although Knossos and Khania provide Cretan examples. However, it is important to refer to them here for a number of reasons. Firstly, similarities among the three Cretan scripts mean that certain signs can be translated throughout the duration of palatial times on the island. This allows a glimpse of some of the plants deemed worth recording by the palaces. Secondly, the listing of numerous other plants in Linear B, used in unguent or oil production, illustrates the variety of species valued by a Bronze Age society, but of which there are little or no palaeobotanical remains. Without the tablets, scholars would have little idea that these plants played important roles in society. It is unsound to extrapolate backwards in time, and suggest that similar plants may have been important in the Minoan periods based solely on Linear B, but a closer look at iconographic and palaeobotanical remains does in fact show that many of the same species were recognised and used during this period too. Thirdly, linguistic analysis of the names of the plants in the tablets can indicate whether they are of indigenous or foreign origin, and so suggests a trade in either plants or plant products in the Late Bronze Age, if not earlier. These three issues are expanded upon below.

Those signs which are similar in two or even three of the scripts show continuity of interest in the same plants. The ideograms for olives, figs, barley, cyperus, and perhaps wheat are the same in both Linear A and B, and indeed, wheat, olives,

and figs are also the same in hieroglyphic (Packard 1974: 20; 26; Palmer 1995). While these are mostly key agricultural crops which may be expected to play an important role in the economy, the inclusion of cyperus is intriguing. Attested in Linear B at Knossos, Pylos, Mycenae, and also Thebes, it has been suggested that this plant's role was in perfume-making (Wylock 1970: 128-133; Shelmerdine 1985: 22). In fact, two types of cyperus are cited in the tablets, leading Sarpaki to suggest that both *Cyperus rotundus*, an aromatic, and *C. esculentus* or *C. longus*, both of which have an edible rhizome, are recorded (Sarpaki 2001: 218). The edible rhizomes seem to be restricted to use in Egypt however, with practically no evidence of their use from elsewhere around the Mediterranean (Zohary and Hopf 2000: 198). Should the Linear B tablets include this species, it would extend the known area where *Cyperus* was perhaps used for food. It should also be mentioned that *Cyperus* had various medicinal uses in the ancient world, such as fumigation of the uterus, or against snakebites (Thompson 1949: 10-11). Larger amounts of *C. rotundus* are listed in the tablets, perhaps reflecting an interest by the administration in controlling a plant which played a role in the production of a luxury commodity (Sarpaki 2001: 219). Shelmerdine comments on the use of cyperus as a stymma, a weakly scented astringent which prepares the base oil for receiving the stronger fragrances which follow, illuminating how this plant could be used in aromatic production (Shelmerdine 1985: 13; 22). Tracing the appearance of *Cyperus rotundus* in Cretan scripts back through the Neopalatial could indicate that some form of perfume-making was present on Crete for hundreds of years before the Mycenaeans, something suggested by the apparent find of oil of iris at Prepalatial Chamalevri (Tzedakis and Martlew 1999: 44-46).

Apart from cyperus, various other non-agricultural plants have been noted in the Linear B tablets from Knossos, Pylos, and Mycenae (Table 3.1). It is thought that their uses included healing remedies and dyestuffs, as well as perfumes and culinary flavourings. Perhaps the most well-known are the Ge series from Mycenae, the 'Spice Tablets' as they are called, and the Fr series of perfumed oils from Pylos (fig. 56). Although debate does continue over the identification of plants from their Linear B names, a number of them appear to be certain. Safflower, fennel, coriander, mint, sesame, cyperus, cumin, alkannet or madder, celery and crocus (saffron), are all relatively securely identified (Killen pers. comm. 2005; Sarpaki 2001: Table 2).[33] Sarpaki is also relatively certain about sage, rose, terebinth, cinnamon, and rock rose (*Cistus*), although others do not necessarily agree with these interpretations (Sarpaki 2001: Table 2). More speculative plants include henna, myrrh, cardamom (or perhaps cress), and iris, as well as some signs which are thought to be plants but as yet have not been translated (Sarpaki

[33] Thanks to Prof. J. Killen who greatly aided my research on spices and plants in Linear B.

2001: Table 3). The majority of these plants are aromatic - the oils they contain can be used in the manufacture of unguents, or perfumes, substances which not only can be used for cosmetic reasons, but which can have medical uses, and also play roles in religious ceremonies, even if their scents seem unusual to modern noses.[34] Cistus is particularly interesting, as the resin exuded by the plant (ladanum) has a long history of medicinal use (Iatridis 1988: 74). The gathering of it is mentioned by Pliny the Elder (e.g. *NH* XXIV: 81; XII: 73-76) and Dioscorides (1.97.4), and still occurs on Crete to this day. The leaves of the plant can be used to make a tea, and it may also be used as a mild psychotropic.[35]

At first glance it seems as though there is little chance of suggesting any continuity between these Mycenaean products, and the plants used in Minoan times. Yet examining both iconographic and palaeobotanical remains shows a number of them were, in fact, in use in earlier periods. Physical remains of fennel, coriander, *Pistacia sp.*, *Cistus*, *Rosacaea* and iris have been identified at diverse sites on Crete, and coriander also appeared in the remains at Akrotiri (see Table 1.1). As discussed in chapter one, analysis of Minoan ceramic vessels is also leading to identification of possible plant oils, including those indicative of saffron, fennel, cumin, sage, safflower, and coriander, to note merely those corresponding to the Linear B tablets.[36] Within Minoan iconography, again certain plants from the tablets have been identified. The problems of pinning representations of plants down to certain species has been discussed already in chapter two, but it is worth mentioning those considered as present in the art. Pennyroyal, a type of mint, was perhaps the intended plant accompanying the Amnisos irises and lilies (Marinatos quoted in Schafer ed. 1992: 150) although Möbius thought perhaps *Micromeria* or *Satureja* were a better fit (1933: 28) (fig. 57). Cameron prefers to see the same plant as a type of sage (or even a vetch), a plant also found apparently on frescoes from the Royal Road excavation (Cameron 1975: 100; Pl. 118a). *Cistus*, the rock-rose, has been suggested for several frescoes: Garland 1 from Fresco of the Garlands (Warren 1985b: 192); the frilled flowers in the Floral Fresco from the Unexplored Mansion at Knossos (Chapin 1997: 16); a small flower in the House of the Frescoes Birds and Monkeys scene (PM II.2: Fig. 275); and the flowers carried by one of the older women in the Xeste 3 frescoes from Akrotiri (N. Marinatos 1984b: 64). It may also appear on a juglet from Phaistos (fig. 58).

[34] See Wylock 1972 for discussion of the diverse uses of herbs and spices at Mycenae.

[35] I am thankful to Yannis Hamilakis for bringing this to my attention, and indeed for suggesting that *Cistus creticum* should be further explored.

[36] This information comes from the Minoans and Mycenaeans: Flavours of their Times exhibition, on display in Birmingham July 2002-January 2003, and talks given at the accompanying conference. Full publication of these results is still pending however (although see Tzedakis and Martlew 1999), and so all such information should be considered with due care until peer-reviewed publication has occurred.

The rose proper is also found in Minoan art; indeed interpretations often overlap with those of the rock-rose as just mentioned. The Birds and Monkeys fresco from House of the Frescoes includes a plant considered a rose (PM II.2: Fig 266), possibly a *Rosa sancta* (Hurst 1967: 63), which is similar to those carried by the Xeste 3 woman (Doumas 1992: Fig. 134). A possible rose plant fresco comes from Archanes (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 480), and a fragment from Ayia Irini looks very similar to other examples of roses in Minoan art (Abramovitz 1980: pl. 10). There are also examples from Pylos, and although obviously these are of later date than the Minoan examples, it is interesting to note that the portrayal of the plant is quite similar (Lang 1969: pls. 71; 73). Iris is yet another plant cited in the tablets which appears in Minoan frescoes. The Amnisos frescoes include irises, as does the Birds and Monkeys from House of the Frescoes (fig. 59). A clump of flowers from Archanes has also been suggested to be irises, although it is difficult to tell as just the leaves remain (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 488). Cameron suggested some form of dwarf iris for flowers on the Unexplored Mansion's Floral Fresco (Cameron 1984: 130). Moving further afield, irises have been reported on the painted floor at Tel Kabri (B. and W-D. Niemeier 2000: 776). Finally, the plant sprig adorning the hair of the seated girl in the Xeste 3 Adorants scene has also been called an iris by some commentators (Marinatos 1984b: 79; fig. 56). Mallow, suggested as an interpretation of *e-pi-ka* on a Pylos tablet (Janko 1981) is also perhaps shown in that fresco bursting with flowers, the Birds and Monkeys from House of the Frescoes (Cameron 1975: 102; pl. 113). The final flower mentioned in Linear B, the crocus, is discussed in greater detail in chapter 4, and so its depictions are not listed here, but see Tables 4.1 - 4.4.

This leaves a number of plants which are listed only in Linear B, but for which no earlier depiction or palaeobotanical evidence has yet been found at a Minoan site: sesame, cinnamon, cumin, myrrh, cardamom/cress, safflower, alkanet, henna, and celery. Henna, safflower, and alkanet are all plants known for their use as dyes, of which only alkanet is native to Greece. Henna, if indeed present, certainly must have been used as a dye, as although the flowers smell sweet, this is only while fresh, and they could not have been imported from overseas before the blooms wilted (Shelmerdine 1985: 30). While the henna plant can be grown in Mediterranean regions, it prefers a more arid climate, and certainly yields better dye when grown in hot regions (A. Morgan 2005), so the cultivation of *Lawsonia inermis* by the Minoans would not have been especially worthwhile. Safflower meanwhile can provide both red and yellow dyes, although the yellow is water soluble (Sarpaki 2001: 207). While the debate continues over the identification of

po-ni-ki-jo, it seems to be viewed as a red-dye provider also, possibly alkanet or else madder.[37] Could one of these four plants be the source of the dye for ears and lips which appear in frescoes from Akrotiri, e.g. the Priestess (fig. 60), or indeed for some of the brightly coloured cloth worn by various protagonists in frescoes?

The five exotic spices (sesame, cinnamon, cumin, myrrh, cardamom) are interesting, as none of them is native to Greece. If indeed their names have been correctly interpreted, the Mycenaeans must have imported them, at least initially, from further east or south. That no evidence for any of them occurs before this period may reflect the expanding international links in the Late Bronze Age. Certainly, it is possible to find traces of these plants palaeobotanically; cumin has been identified at a number of sites around the Mediterranean (Zohary and Hopf 2000: 206), and sesame found further east at Harappa and Karmir-blur (Zohary and Hopf 2000: 140-141). Cinnamon and cardamon have woody parts which can be recovered palaeobotanically, but as yet no traces have come from a Greek Bronze Age site. Finally, myrrh, which has been recovered from Egyptian tombs (Lucas 1962: 92), is also identifiable, like other resins, using raman spectroscopy (Edwards: 2005: 268-277), although none has so far turned up from Greece. The absence of palaeobotanical remains of these substances from Minoan sites may be simply an accident of preservation. Their iconographic invisibility may reflect a lack of appeal to the artist compared with more colourful flowers, or more likely the difficulty of new plants breaking into an established canon of culturally meaningful ones. The later apparent arrival of such spices in Greece may reflect a growing interest in new smells and flavours in the later Bronze Age. That these spices also all had various medicinal uses in the lands further east, should not be overlooked either. Thompson details such functions; for example, myrrh was used by the Assyrians not just as an incense, but internally for urinary problems or as an enema (Thompson 1949: 339). Medicine of exotic origin is often deemed more effective than that available easily and locally, and so would be a highly desirable import.

Yet were any of these substances actually imported to Greece in the Late Bronze Age or is it possible that they grew there? Killen has deduced that the House of the Sphinxes, outside the citadel at Mycenae, was not an independent merchant's house, as believed by various scholars (e.g. Mylonas 1957: 70-73; Vermeule 1964: 182), but in fact connected to the central administration (Killen 1983: 229) (fig. 61). The Ge spice tablets show clear parallels to other taxation records, and so Killen suggests that "it makes it probable that all [spices] were locally produced and did

[37] See Sarpaki 2001: 221-221 for discussion of the various interpretations of *po-no-ki-jo* as a red or purple dyestuff.

not have to be imported."(Killen forthcoming: 31) Of course, he means imported on a regular basis, although for some of the plants to grow in Greece, they would necessarily have been imported originally. Is it then plausible to consider that once the value of such spices as cumin or sesame was appreciated by Bronze Age elites, they commenced cultivation of the crops in Greece to ensure a steady supply, for whatever purposes such substances were used?

Linguistic analysis of the etymology of plant names can be a valuable ethnobotanical tool, as mentioned above, and should be considered to see whether it can add anything to this discussion. An in-depth linguistic study is beyond the expertise of this author, but it is important to include what is known thus far.[38] Is it possible that the Linear B terms give some indication of whether the plant in question was native or cultivated in Greece, or came from further afield? Interestingly, as Masson points out, it is among plant names that the greatest number of non-Greek words appear, reflecting their movement around the ancient world (Masson 1967: 46). In fact, it seems that the majority of terms for spices are of non-Indo-European origin. Going back to the Bronze Age, *ku-mi-no*, *sa-sa-ma*, and *ko-ro-ki-no*, or cumin, sesame and crocus (saffron) are Semitic imports; *ka-da-mi-ja* (cress/cardamom), *ku-pa-ro* (cyperus), *mi-ta* (mint), *se-ri-no* (celery) and *po-ni-ki-jo* (alkanet/madder) are all borrowed words too; *ko-no* (rushes?) has no etymology; *ka-na-ko* (safflower), *ma-ra-tu-wo* (fennel) and *ko-ri-ja-da-na* (coriander) may have indigenous origins (Chantraine 1968). *Po-ni-ki-jo* in particular has received a lot of attention, with some commentators literally interpreting it as meaning "the Phoenician substance" (Killen: pers. comm. 2005; see Murray and Warren 1976 for alternative interpretations), perhaps a linguistic clue to that plant's biography. So while the terms for many of these products are linguistic borrowings, underlining the non-Greek origin of many of the plants or their products, it is also fair to conclude that at least some of the species came to be grown in Greece during the Late Bronze Age. That some of them were examples of the 'travelling plants' discussed in chapter two seems likely, although whether they reached Greece via trade or as gifts is impossible to say.

Ethnobotanical methodology and the Aegean Bronze Age: myths

Examination of a society's myths may provide useful information about the roles of certain plants. Symbolic analysis of myths was pioneered by Claude Levi-Strauss in the mid-twentieth century. He believed that myths seize on concrete features of the world, like plants or animals, using them to construct a logic of how the world is (Tilley 1990: 20-21). By collecting myths, and identifying common or important motifs, it is possible to see how plants got their names and which

[38] This paragraph is based on communication with Prof. Killen and reading suggested by him.

plants are deemed symbolically important by the relevant culture. Another example from the Waimiri Atroari tells of how the *wiamy dydwe* or "tortoise's ladder" got its name. Mawa, the first Indian, wanted to live in the sky, and asked the animals to shoot up an arrow with a vine attached, so he could climb to the sky. Only Tortoise was able to do this, and so Mawa invited Tortoise to climb up and join him. But Tortoise was unable to climb the vine, and to prevent Spider-monkey coming up instead, Mawa cut the vine, and it fell to the treetops, where it, and the monkeys, are still found today (Milliken *et al.* 1992: 42).

It seems likely that some plants would have featured in the mythology of the Minoans, as they appear in myths from societies of different levels all around the world. Ranging from contemporary rainforest dwellers to classical Greece to the Aztec empire, fables featuring important plants are not uncommon. Many of these tales relate how a plant came to be domesticated or first utilised by a society. For example, the Aztec tales of Mayahuel, a personification of the maguey cactus, tell of the discovery of *octli* (pulque), an Aztec beverage (Brundage 1979: 158). Other stories feature transformations between humans and plants. Ovid's *Metamorphoses* include Narcissus changing into a flower (III. 339-510) and Myrrha turning into a tree (X. 298-502), for example. The Achuar have numerous stories about how the plants surrounding them appeared on earth; for example, how two women became dye plants (rocou and genipa) after fruitless quests to find a lover (Descola 1997:98). It has even been suggested that the cranial deformation practised by the Classic Maya was "to approximate the elongated form of the maize cob head of the corn deity, living humans embodied a human/maize plant hybrid" (Meskell and Joyce 2003: 93). The transformation seems much rarer in reverse however, with tales of plants becoming human difficult to find in traditional mythology. Occasionally plants come alive, such as the Ents, the great living trees from Tolkien's *Lord of the Rings*, or John Wyndham's terrifying triffids, but they retain their plant form. An interesting form of plant/human hybrid becomes popular in New Kingdom Egypt as the 'tree-goddess', where a divine female is depicted emerging from a tree trunk body (Meskell and Joyce 2003: 86-87). On another level, even if a plant is not a key protagonist within a myth, it can make interesting appearances. Prometheus, for example, brought fire from the heavens to humans in the hollow stalk of a fennel plant (*Theog.* 565-67), while Odysseus's reliance on moly to preserve himself from Circe's spells is well-known (*Od.* X. 304-306).

Yet how could one ever hope to attain an identification or understanding of Minoan mythology, let alone use it to then identify important plants? That some

scenes from Bronze Age art may show mythological elements is certainly a possibility. Morris suggested that the miniature frieze from the West House, Akrotiri, depicted standard epic scenes recounted in the Bronze Age (Morris 1989). That a proto-version of the Demeter/Persephone (or Eurydice) story was known in the Bronze Age is suggested by Marinatos who sees the Theran Xeste 3 'Adorants' fresco as a representation of such a myth (Marinatos 1984b: 80-81). Generally though there have been few other attempts to identify myths within iconography. While the plants which occur on ceramics and other portable art are likely to have been chosen purposefully, it is not possible to tell from single motifs whether they had a role in any myth. Nonetheless, it could be suggested that their importance, and hence such depictions, derives from a mythological prominence. With the frescoes, some scenes could theoretically be representations of Minoan myths incorporating a vegetal dimension. In particular, where divine or supernatural elements are included, a mythological interpretation could be offered. Springing to mind here is the scene from Xeste 3 of the offering of saffron to a female figure, via a monkey, with a griffin in attendance. Certainly this is not a quotidian scene, but how to tell if it reflects a myth eludes the modern commentator. It should not be a surprise to find Minoan depictions of myths telling of plant-gifts from the gods. Is it possible to read the Xeste 3 scene in reverse, and see it as showing a deity providing the gift of saffron cultivation to the Therans, via a monkey intermediary? The girl emptying her basket at the foot of the platform probably mitigates against such an interpretation, but the 'right' way of reading narrative in ancient art is much debated and scenes should remain open to new ways of understanding. In fact, the distinction between myth and religion/ritual is fuzzy at the best of times, and many of the Minoan scenes which are usually interpreted as being of religious importance could equally show mythological imagery. Not to say that this then excludes a religious function for the scene, but mythical subject matter seems less popular among archaeologists as an interpretation than ritual. Ultimately, it appears that although possible candidates for mythological plants could be determined, this line of enquiry is of limited value for non-extant societies lacking in literature.

Ethnobotanical methodology and the Aegean Bronze Age: plant specimens

Another key source of ethnobotanical data is the collection of specimens, both from present day environments, and from those of the past, via archaeobotanical methodology. In a project wishing to understand the folk taxonomy of the Tzeltal Indians of Chiapas, Mexico, a key component of the fieldwork involved collecting samples of every plant in the region (Berlin, Breedlove and Raven 1974). The ethnobotanists could then get the Tzeltal to identify and arrange the plants as they

feature within their own classification of nature, comparing this to the canonical Western framework. Thus a picture of the total flora of the study area could be created, as well as a cognitive map of the Tzeltal relations to plants. Collecting specimens is vitally important and will include plants that, by virtue of not having a specific function in that society, would be overlooked in oral testimonies. Collected plants are often tested pharmacologically too, to compare their chemical properties to those claimed for them by the native informants. Furthermore, it is important to consider any agricultural systems or landscapes as a whole as well as the individual plants; whether privately-owned land is devoted equally to annual crops, perennial crops and wild resources, or whether there are areas of community land from which wild resources may be gathered (Alcorn 1995: 1; 9).

The collection and analysis of archaeobotanical data, as discussed in chapter one, is one area of ethnobotany in which archaeologists are constantly improving. Excavations, where financially possible, now try to carry out tests on botanical material to solve questions about manipulation of plants in the past. Environmental data from surveys can help illuminate past vegetation cover or climate. Work in specialised fields like palynology, phytolith analysis, charcoal remains, chemical analysis, and even coprolite studies, all help to shed light on the plants utilised by past societies. Perhaps the main difference between ethnobotanical plant collections and those from archaeological projects is that pharmacological testing as a standard part of analysis is lacking in archaeology. Using a combination of sampling techniques however, it is possible to identify numerous different plants employed in the Bronze Age, and a broad range of uses can be suggested for them.

Some Aegean archaeological publications have also included references to what could be termed 'ethnobotanical-type' studies, where they refer to roles of plants beyond the canon of traditional foodstuffs. The Melos project, for example, refers to the fact that acorns can be eaten by humans, and also that the role of herbs and wild greens or xo/rta in people's diets must not be overlooked (Renfrew and Wagstaff 1982: 103). They also remind the reader that prunings, from olive trees for example, can be used for fuel (Renfrew and Wagstaff 1982: 104) - an important use-category of plants that archaeologists often neglect. The Messenia publication gives a quick mention to reeds (*Arundo donax*) or kala/mi, another plant that is highly versatile, and was depicted on Bronze Age ceramics and wall-paintings. It can be used for plant supports, roofing, constructing sun-shelters and chicken coops and other small non-permanent structures (Macdonald and Rapp 1972: 57). Keos provides a study of the velanidi acorn, used in the tanning industry (Cherry,

Davis and Mantzourani 1991: 447-449), and the evidence of unusual plants like coriander and caper from Franchthi cave (Jameson, Runnels and van Andel 1994: 168) at least alert the archaeologist that many other plants beyond the usual grains and pulses would have been used. Archaeologists therefore are well aware of the potential of collecting plant specimens, but often encounter difficulties in extrapolating back to the past from such material. It is suggested here that plant samples must be used more frequently in conjunction with other types of evidence (iconographic, linguistic) to build up a clearer picture of plant roles in past societies.

Ethnobotanical methodology and the Aegean Bronze Age: art

An examination of a society's art is another way in which ethnobotanists add to their store of information on the plants important to a particular culture. There is no shortage of studies of depictions of plants in various artistic media from different societies around the world, both living and from the past. The Inca, whose heartland lay in Peru, venerated the coca plant (*Erythroxylum coca*), which can be seen in their art. Vessels which appear to represent the spiky seed pods of datura, a powerful hallucinogen, have been found among Mexican and southwest American Indian cultures (Litzinger 1981). The peyote cactus appears frequently in the art of the Huichol Indians (Myerhoff 1974) (fig. 62). Paintings of tulips from 17th century Holland are not just examples of the Dutch genre of still-life, but indicate the role this bulb played for a short period of time, where one bulb could exchange hands for more than several years' average wage (Pavord 1999). The illustration of herbals has already been discussed, and later the Victorian "language of flowers" developed, whereby the depiction of certain blossoms indicated a message within the picture; e.g. a red chrysanthemum indicated "I love" whereas a yellow one meant "slighted love" (Coleman 1996: 15).

The key point to bear in mind here is that these examples are representative of the vast majority of plants in art from around the world, in that they are portrayed because they are important to the society depicting them. Whether they play a role in ritual, such as peyote, or have economic and cultural importance, like the tulip, their appearance on ceramics, or fabrics, or walls is neither accidental nor random, but a deliberate act. The abundance of floral motifs in Minoan art has been stressed throughout this thesis, and although the motive behind such depictions remains elusive, they form a considerable resource which an ethnobotanical study cannot afford to dismiss. Certainly there has been much debate about the meanings of precise frescoes or individual motifs on pots, but archaeologists should also perhaps zoom out occasionally and consider particular

plants as playing a meaningful role in Minoan society. Based on ethnographic work, such as those cited above, it becomes apparent that such plants as lily and crocus were not randomly selected but bearers of meaning. The rich body of iconographic material must be used in tandem with any palaeobotanical remains or linguistic clues to approach a broader understanding of human-plant relationships in the Bronze Age.

Based on this discussion of the methodology of ethnobotany, it can be seen that although today's archaeologists do not have any Minoans to interview, there are still other ways to learn about their relationship with nature. Such methods have worked successfully for ethnobotanists, and while extrapolating from Linear B will never provide as clear a picture as one-on-one interviews, such studies, combined with art, modern plant surveys, pharmacological work and palaeobotanical specimens have the potential to illuminate a more holistic picture of plants and people. To what extent such an approach is successful, and the difficulties encountered in putting the varying methods into action, is the subject for the next section.

3.3 Comparative Case-Studies

Having reviewed ethnobotanical methodology in general and considered its possible applications to Bronze Age studies, this section consists of a comparison between two actual projects, one by archaeologists, and one by ethnobotanists. The Kommos project in Crete and the Waimiri Atroari project in Brazil are selected for examination, with the intention of highlighting the different questions asked, methods used, and results obtained. Some suggestions are then made as to how archaeological projects like Kommos could more usefully integrate ethnobotanical methods and so ask further questions of the material. Kommos was chosen as the case study because the scale of the work on plants in it far exceeds that of any other Greek archaeological publication. It therefore seems the most appropriate to compare with a true ethnobotanical study, and while the two societies in question function at different levels of complexity, this should not be seen as a problem as the purpose of this study is to compare the questions asked rather than the answers. In fact, practically all ethnobotanical studies published today are those carried out on pre-literate peoples, and so finding a study of a society at a similar level to the Minoans proved impossible.

(i) Kommos

- *Background*

The site of Kommos is situated on the south-west coast of Crete, in the fertile

region known as the Mesara, and near the important Minoan sites of Phaistos and Ayia Triadha (fig. 63). Excavation of the site commenced in 1976, and ran till 1990 (Shaw and Shaw 1995: 14). Apart from some Iron Age, Archaic, Classical, and Roman period finds, the site consists primarily of a Middle and Late Minoan town, with some accompanying Early Minoan remains (Shaw and Shaw 1995: 12). The results of the excavation and related studies are being published in a series by Princeton University Press; the relevant volume for this comparative study is Vol. I, part 1, which focuses on the Kommos region and ecology (Shaw and Shaw 1995).

• *Aims*

While this volume tends towards a somewhat traditional archaeological report, with different chapters written by specialists in different disciplines, the inclusion of a chapter which examines both modern plants and those discovered palaeobotanically on the site is notable. A stated aim of the research is to "explore the kinds of plants available to the inhabitants of Kommos during its long occupation and the ways in which these plants were used" (Shay and Shay 1995: 92). In essence then, the Shays are attempting to do a wide-ranging ethnobotanical study, rather than focusing solely on seeds or charcoal, as is often the case with archaeological reports.

• *Methodology*

The methods used for their investigation can be split into those providing information on contemporary plants and those using palaeobotanical specimens. They also make use of general background studies, considering the climate, geology and soils of the region in question. A survey of the flora in the immediate Kommos vicinity was carried out, including the collection of samples for identification. Local people were interviewed about their plant use, as well as observed carrying out various activities such as collecting young greens for consumption. After collecting the information, it was then subject to a number of statistical analyses. The nature of human influence on the landscape was also studied, e.g. how fire and grazing affect the region's plant life. Analysis of palaeobotanical material from Minoan contexts complemented this research. Charcoal samples and charred seeds were examined in a laboratory, aided by a reference collection gathered from the Kommos area. Results from nearby pollen cores were also consulted.

• *Results*

This two-pronged analysis results in a comprehensive study of the contemporary

landscape, both of the processes which went into shaping it as seen today, and a detailed list of the plants which grow there, as well as providing information about plants utilised in the past. Land clearance by humans, the introduction of foreign plants, fire, grazing and plant gathering all are discussed for their ecological impact. The landscape itself is divided into diverse plant communities, ranging from sea cliffs to grasslands. Most interestingly, the Shays divide the plants found into different use-categories, a typical ethnobotanical exercise. These categories are: food, flavouring, beverage, ritual or ceremonial, decoration, fuel, utility (general use), medicinal, poison, animal fodder (Shay and Shay 1995: 109). The accompanying appendix is a detailed plant list for the species found in the Kommos area, including the known uses for each plant, e.g. *Cistus creticus* is used for beverages, decoration, utility and medicinal (Shay and Shay 1995: 138). Various tables then list the seeds and charcoal from the Minoan levels of the site.

(ii) Waimiri Atroari

• *Background*

The Waimiri Atroari are a tribe of forest Indians living in a range of approximately 2.5 million hectares of the Brazilian rainforest to the north of Manaus (Milliken *et al.* 1992: 5). Their population is estimated to be in the region of 500, and the people live in villages, consisting of one large round-house, located along the main rivers (Milliken *et al.* 1992: 11). They practice swidden agriculture and some hunting, and are now sedentary, although mobility was greater in the past (Milliken *et al.* 1992: 12). Contact with outsiders was limited to hunters and rubber-tappers until the 1970s when a main highway was constructed through their lands (Milliken *et al.* 1992: 5-7). A number of anthropological and ethnobotanical studies have been carried out amongst them; the one chosen for comparison is the most recent, carried out in 1989, and published by Kew Gardens (Milliken *et al.* 1992). The focus of this particular study was the village of Maré, on the right bank of the Rio Camanaú, population 60 (Milliken *et al.* 1992: 13).

• *Aims*

The aims of this study are explicitly stated at the start of the publication, and were as follows: to determine the degree to which the Waimiri Atroari utilise their forest resources; to record part of the Indians' knowledge of useful forest plants; to determine the effects of increased external contact upon the Indians' relationship with the environment (Milliken *et al.* 1992: 3). While it does not purport to be an exhaustive ethnobotany, nevertheless it deals with many of the key issues considered in such a study.

• *Methodology*

Collecting of samples and interviews were the main methods used in this study. A one-hectare site outside the village was divided into transects, and specimens were recorded, counted and collected (Milliken *et al.* 1992: 14). Locals were taken into the forest and quizzed about individual plants; in a second phase of information gathering, specimens were sorted into groups and shown to village inhabitants, again with the aim of elucidating their useful properties, the Indian names, their relationship with animals, and any other useful information (Milliken *et al.* 1992: 15). Miscellaneous plants occurring outside the designated survey area were collected if considered important by the Indians. Observation also played a role in this study, with the type of plants used for ornaments, construction, fuel *etc.* seen *in situ* in the village.

• *Results*

These methods result in a compact survey of the plants used by one Waimiri Atroari village. Plants are treated under separate use categories: food, technology (incorporating hunting, craft, adornment, transport, miscellaneous), medicine, construction, fuel, ritual and belief, and commercial. A detailed list of every plant studied is provided, including the local and scientific names, and the various uses (Milliken *et al.* 1992: Table 3). That the tribe are heavily dependent on the forest for every aspect of their physical, cultural and spiritual lives becomes apparent (Milliken *et al.* 1992: 119). Recent contact with outsiders has led to changes in the traditional knowledge and use of plants, with new species and attitudes being imported, while traditional ones are forgotten and replaced (Milliken *et al.* 1992: 46). Appendices feature Waimiri Atroari use-categories, (e.g. "wood used for axe handles"), medicinal plants utilised locally, and a linguistic table listing vernacular and scientific names of animals.

(iii) Conclusions

Having summarised the two studies in question, it is interesting to compare and contrast them both. As stated above, it is not the results *per se* which are of interest here, as opposed to the goals and the methods used to achieve them. One method which is common to both studies is the division of plants into use-categories. There is much continuity between the selected categories, with food (incorporating drinks and flavourings), ritual, fuel, and medicine prominently featuring in both surveys, while decoration/adornment, and utility/construction/craft mostly overlap also. Differences are that only the Kommos project has categories for poison and fodder, while the Waimiri Atroari has commercial, transport, hunting and miscellaneous as unique to it. To consider

plants beyond the 'food' category is an important step for Bronze Age studies, and should be emulated in future projects. While both studies base their results largely on talking to people, and therefore focus on the present for their use-categories, they both make attempts at extrapolating back into the past. The modern uses of the wood identified from Bronze Age charcoal are listed by the Shays, with the intention of perhaps suggesting how they could have been used in the past (Shay and Shay 1995: Table 4.13). Ceramic sherds are used by Milliken *et al.* to identify sites with previous occupation, and so they are able to detect a preference for cultivating a specific type of soil among the Indians (Milliken *et al.* 1992: 21-22).

Both studies fall down in their retrieval of palaeobotanical remains; none are utilised in the Amazonian study, while for Kommos, it appears that most samples were simply those which the excavators saw with the naked eye, and that water-screening and flotation were not methodically employed (Shay and Shay 1995: 117). However, while this criticism is one which could be applied to the majority of archaeological projects, whether due to lack of funds or other reasons, it goes without saying that more specimens of Bronze Age material could only help such a study. Both studies also collected living plant specimens as part of their methodology. The information the Shays gained about the variety of uses to which plants can be put is unparalleled for a work based on a Minoan site. However, it was unfortunate that their fieldwork was only carried out between March and July (Shay and Shay 1995: 94), presumably dictated by holiday periods from universities, as tends to be the norm for fieldwork in Greece. Somewhat surprisingly, fieldwork in the Amazon was done only from August to December (Milliken *et al.* 1992: 3). Therefore in both these studies months of plant-related activity were not observed. Year-round observation of the flora of any region being studied is essential to gain an understanding of how seasonal change affects the resources available.

Another feature common to both surveys was interviewing and observing locals interacting with plants. This provides information otherwise unrecoverable, such as which plants are believed to give dogs extra power before hunting trips (Milliken *et al.* 1992: 35-36), or which bush is used as a fire-starter (Shay and Shay 1995: 112). In the Kommos study, this could have been done in more systematic manner. For example, to compare women's and men's plant knowledge might have been interesting, and is certainly the type of thing deemed necessary in ethnobotanical surveys. That certain plant-related tasks are women's work emerges from the Waimiri Atroari, and while identifying such behaviour in a

Minoan society is more difficult, an awareness of such divisions needs to be raised. Actual artefacts were also referred to for the Amazonian work (e.g. pottery, canoes, arrows, baskets) whereas for Kommos, no reference was made to any material remains which could have complemented the information coming from palaeobotanical or contemporary sources.

Although many of the methods used are common to both surveys, the conclusion must be drawn that the work on Kommos, although groundbreaking within the Aegean, does not make the most of the evidence available. Results from the present-day survey are not integrated with those from the Minoan period to try and provide a fuller exploration of a Bronze Age interaction with the landscape and plants. The difficulties inherent in inferring past plant uses are raised, but this is limited to pointing out the various problems encountered with the palaeobotanic record (Shay and Shay 1995: 119-120), which itself could have been more fully recovered. Resources such as art, as discussed above, should have been considered also. Kommos has no shortage of ceramics from the Bronze Age, and depictions of plants on these could have been incorporated into an overall consideration of palaeoethnobotany. Certainly the Kommos project explores methodologies new to archaeology, such as interviews and plant collection, but there is considerable potential for probing the material further in the hope of advancing towards a more holistic ethnobotany of the Minoans.

3.4 The Nature of Nature

Emerging out of these considerations of ethnobotanical methods and results, are some interesting conceptual questions, which are explored in the next two sections of this chapter. The first issue is that of the concept of 'nature', usually opposed to 'culture' within a western framework, although such duality is certainly not the only way of thinking about the world

Nature as mind; nature as machine

An awareness of 'nature' is not a new concept. To the ancient Greeks, the orderliness in the natural world indicated that it was intelligent, and as it was also in constant motion, it had vitality too. This idea was based on analogy with the human body - a body in constant motion whose actions are directed by a mind (Collingwood 1945: 8). Therefore, nature had a mind and soul of its own. All plants and animals participated in this soul as well as in the actual physicality of the world (Collingwood 1945: 3). For Aristotle, for example, the world was full of purpose, the identification of which was the goal of his natural history (French 1994: 13). Plato wondered whether it had been planned by a beneficent being

(McGowan Tress 1997: 34). The idea of 'nature imperiled' is not encountered, as its well-being is self-perpetuating, or perhaps divinely ordained (McGowan Tress 1997: 40-41). In the works of the ancient Greeks, no real human-nature dualism can be found. This is unsurprising, as Aristotle and Plato voice the belief that not all humans were the same (e.g. slaves were not the same as freemen). Therefore, there was no overall concept of the common nature of humanity which could then be opposed to nature (Plumwood 1993: 105).

This had certainly changed by the 16th and 17th centuries, the time of the early Enlightenment. For Descartes, mind was what separated humans from the rest of nature. It was now denied that the world was an organism, capable of rational, intelligent life or movement; instead 'laws of nature' were responsible for everything (Collingwood 1945: 5). Laws about motion or force, for example, affected nature and could be studied independently - a 'passive' nature could be observed by an 'active' human (Thomas 2001: 167). This inert nature has no goals of its own, so, as Plumwood puts it, "If it lacks its own goals and direction, it can impose no constraints on our treatment of it; it can be seen as something utterly neutral on which humans can and even must impose their own goals, purposes and significance" (Plumwood 1993: 110). The natural world was "an arrangement of bodily parts designed and put together and set going for a definite purpose by an intelligent mind outside itself" (Collingwood 1945: 5). Nature, long seen as a 'feminine' force, became dominated by masculine philosophy (Classen 1998: 86). The analogy moved from man to machine, in this age of new mechanical marvels, with God now seen as the omnipotent designer. This was the framework in which Western science began to develop, and its goals were ultimately in harmony with the contemporary theology (Kinsey 1996: 114). To understand the mind of God, and to extend the God-given right of man to dominate plants and animals by learning ever more about them, through botany or zoology for example, were the aims of much study in the 17th and 18th centuries (Kinsey 1996: 115).

The 18th century had, in fact, seen the rise of historical studies focused on change, process and development (Collingwood 1945: 10). The idea of evolution began to affect all types of thinking, and the world/nature was perceived as having a history and being subject to change (Morton 1981: 288). Yet this change was still scientifically knowable. And nature itself was still denied any intentionality. Instead, the Western concept of progress became linked to the continual overcoming of the domain of nature, which could now be seen as a commodity (Plumwood 1993: 3; 111), an attitude which has persisted into the twentieth century.

Nature and Christianity

This idea of nature as something outside humanity, waiting to be dominated, may not be only a few centuries old. In fact, it is also possible to find the issue enmeshed within Judaeo-Christian dogma for the past two thousand years. Three basic reasons as to why this view is possible have been suggested: the Bible strips nature of gods, goddesses, and spirits, and ceases to see it as having divine qualities; the Bible is anthropocentric, teaching that humans are divinely ordained to rule over other species and nature in general; and many Christian writers and theology relegate 'matter', and so nature, to a low status relative to 'spirit' which is found in the divine (Kinsey 1996: 104). For example:

> "God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth." God said, "See, I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food." (Genesis 1: 28-29)

This is a clear instruction that nature is for the use of humans, an idea which crops up in the thoughts of later Christian writers as varied as Aquinas and Calvin. Henry More pushed it even further in 1653, claiming that sheep and cattle had been given life by God simply to keep their meat fresh until humans were ready to eat them (Kinsey 1996: 114).

As with all arguments however, there is a response to this one, which concentrates on how Christianity actually promotes ecological responsibility. Just as passages can be selected from the Bible to show how it encourages human domination over nature, so can passages be chosen which emphasise respect for the natural world. There are verses on treating animals well, on letting land lie fallow every seventh year (Leviticus 25: 1-7), on not cutting down trees needlessly (Deuteronomy 20: 19-20). St. Augustine and St. Francis of Assissi both saw beauty in God's creation, and encouraged joy in nature. Furthermore, although nature is not portrayed as sacred or divine in the Bible, neither is it a dead and lifeless object (Kinsey 1996: 118). Psalm 96, for example, includes the lines "Then shall all the trees of the forest sing for joy before the Lord" (Psalm 96:13). Although not full of the spirits which are often claimed to lurk in every stream or tree for 'pagan' societies, nature nonetheless is not a totally insentient being in a Christian mindset. Recently, there has been a rise in the Christian ecology movement, which aims to encourage churches to embrace environmental issues (Thompson 2007).

Contemporary society and nature

The nature/culture dichotomy that is now so familiar is a far from 'natural' thing itself, dating really only from the Enlightenment. As nature became something to be studied, it was pushed further apart from humans. As Thomas notes, "the valorization of human beings as the bearers of reason creates an imperative to construe nature as something which exists for them: at once a home and a store of resources." (Thomas 2001: 167). In more recent times, there have been several backlashes against this viewpoint. Groups such as Greenpeace, the Green Party, and the Gaia movement, who all claim environmental awareness as a core concept, are working to change this Western perception of nature, moving towards protecting and preserving it instead of abusing it. In academic circles, historical ecologists claim to overcome the stumbling-block of Cartesian dualism by seeing it more as a dialogue: "There is no subject/object, human/nature dichotomy because we and they are simultaneously both subject and object of study" (Balée 1998: 409). The Ecofeminist movement draws parallels between the colonisation and exploitation by the dominant patriarchal world system of 'foreign' peoples and their lands, of women, and of nature itself (Mies and Shiva 1993: 2). The striving of the ecofeminists for a new cosmology which recognises that life in nature is maintained by means of co-operation and mutual care and love (Mies and Shiva 1993: 6) has been derided by the establishment. Often their choice of words, like "healing the wounds" and "reweaving the web" seem to provoke the ire of less alternative people the world over, as do mentions of the Goddess movement, to which it is closely linked. Yet, feminist agendas aside, their vision of "the interconnectedness of life" (Mies and Shiva 1993: 16) is perhaps more similar to how the majority of societies have situated themselves in nature than people are led to believe.

These movements are exceptions however, and although today it is accepted that humans are animals, we see ourselves as no longer simply part of nature, but more as part of this other entity we have created, 'culture'. An interesting essay by Richard Mabey examines the role of nature films in reinforcing human aloofness from the rest of nature. As technological advances mean it is possible to pry into nature's innermost secrets (e.g. filming inside insect nests), humans have come to believe they can, and should, know everything about all things (Mabey 2003: 4). This serves to further separate humanity from other animals and plants. As Mabey says, "The fact is that in almost every area of our public culture we are disengaging from nature, rendering it as a plaything ... and always as an object."(Mabey 2003: 6). To what extent this nature/culture duality is foisted upon other societies (including those of the Aegean Bronze Age) by western scholarship

should be a cause for concern.

Recent ethnobiological investigations have opened Western minds to other possible ways of viewing nature. Posey writes of indigenous peoples that

> "For them, nature is an extension of society itself, and the creatures that share life with them are manifestations of past and future generations - of their own flesh and blood. Nature is not, therefore, a commodity to be bought, sold, patented or preserved apart from society, precisely because nature is what defines humanity" (Posey 1999: xvii).

As well as not being commodified, nature is also not thought about in a 'scientific' way, as a separate entity to humans. Usually, indigenous or traditional societies have an intricate, complex relationship with their environment, existing as part of the overall system of the natural world. All creation may often be seen as sacred, and these societies can view themselves as guardians of nature (Posey 2002: 4). This template is one that should be considered for the inhabitants of the Bronze Age Aegean, in their pre-Christian, pre-Cartesian, non-industrial societies. Although not a hunter-gatherer mobile culture, which is the type often studied by modern anthropologists, the nature-view of the Minoans may have been closer to that identified above than to modern Western dualist conceptions.

It is equally important here not to get drawn into the hyperbole of the Noble Savage, living in harmony with nature, wise in ways the West will never understand. Born in the Enlightenment, this creature is often held up as the contrast to what Balée calls "Homo Devastans", that is, humanity as naturally destructive, polluting, and reducing biodiversity (Balée 1998: 16). It should be obvious that both these characters are stereotypes, and both are conjured up at apposite moments to fuel the debates between different factions. In efforts to relocate the Minoans in an appropriate relationship with the plant world, it must be remembered that their society was more complex than many of those studied ethnobotanically, and so their perception of the natural world may also have been more complex than simply "guardians of nature".

Anthropological models and the Minoans

The ever-increasing amount of ethnographic fieldwork publications has undoubtedly opened academic eyes to the multiplicity of 'natures' which exist across the globe. If nature/culture dualism is rejected, what then replaces it? Faced with such evidence, are the only options to limit study to local cosmologies, or, at the other end of the scale, to search for general trends that would enable these different concepts of nature to be replaced with a unified analytical framework

(Descola and Palsson 1996: 15)? The difficulty is exacerbated when it is considered that not all members of one culture may even share an unambiguous concept of 'nature' (Ellen 1996: 104). For such a concept to exist at all, it must be placed in opposition to something, i.e. humans, culture, society, civilisation *etc.* Does this indicate that to identify what nature is, one must first identify what humans are, and from here build up meaningful relations with the rest of the world?

Descola suggests three modes of relation can exist between humans and the non-human world: reciprocity, predation, and protection (Descola 1996: 89-90). In a reciprocal relation, humans and non-humans all contribute to the balance of the cosmos. In predation mode, humans do not return anything after taking what they need from nature, while protection implies that the non-humans are dependent on humans for existence, i.e. domesticated plants and animals. Pàlsson offers a different analysis of human-nature interaction, suggesting orientalism, paternalism and communalism as three expressions of the relationship (Pàlsson 1996: 66). Orientalism involves exploitation of nature, and while paternalism also implies human mastery, it entails a more balanced reciprocity, where humans protect as well as consume nature. Communalism totally rejects separation of nature and society, and sees the interaction as a dialogue between equals. Such theorising helps acknowledge that this subject is not just black and white, a choice to destroy nature or live in harmony, and illuminates the nuances of human-nature interaction and conceptualisation. Ingold pushes the boundaries of the debate even further, noting that recognising all these alternative cosmologies of different societies in fact assumes an underlying 'reality' of nature upon which they are imposed (Ingold 2000: 15). The existence of this etic nature must be questioned also. However, to avoid tumbling down a spiral of reductionism, in which nothing can ever be concluded, it is perhaps better to consider a Minoan view of nature in the light of the above theories.

There has been little explicitly written on the Minoan relationship with the natural world, but occasionally the prevalent attitude within scholarship can be glimpsed. Marinatos has interpreted the Ship Procession fresco from Thera as expressing the idea of dominance over land and sea (Marinatos 2000). The range of motifs painted on the vessels' hulls, including water, coastline, animals and birds, may represent "the totality of nature" she suggests (Marinatos 2000: 908). The landscapes of the ships are a symbolic code which "represent the realms of nature which are won over and conquered by the Minoans" (Marinatos 2000: 913). This interpretation of the ship landscapes assumes a Bronze Age nature-view where the natural world was something to dominate, to control. As was explained

above, such an attitude is a relatively modern concept and should not be unquestioningly applied to a society living several thousand years ago.

It may be appropriate to suggest that it seems equally unlikely that the Minoans, as a relatively urbanised, non-mobile society, would have seen themselves as an indistinguishable part of nature, as many hunter-gatherers tend to do (Pàlsson 1996: 72). Further support for this can be found in the universally perceived awareness of the difference between natural biological artefacts, and those which exist due to human beings' labours (Atran 1990: 216). This distinction seems to be one which is sometimes flirted with by the Minoan craftsmen, who carve realistic shells out of stones, flowers out of faience, and even shape stone bowls to look like flower calyces (fig. 64; fig. 114). This perhaps is not the behaviour of a society which sees itself as one and the same as the natural world, but one which is able to observe, create and adapt from outside the environment, playing with the natural/cultural divide. That Minoans had domesticated plants, and used numerous others which they would have gathered from the wild, quite possibly encouraging and tending them, leans towards Pàlsson's paternalistic mode. While the Minoans may have realised they were outside nature, and able to control parts of the natural world, it was also important to look after it and exist within it. Identification of a specific 'Nature Goddess' in Bronze Age iconography has not yet been satisfactorily proven, but if a deity or deities were worshipped for their connection to the natural world, this would support the idea of Minoans looking after their surroundings. In this ongoing dispute over the nature of nature and its very existence, there is no final truth it seems, but to move forward, scholarship must go beyond the tired nature/culture duality, and use meaningful comparison to stimulate new ways of thinking about the Bronze Age.

3.5 Classification of the Natural World

One of the main concerns of ethnobotanists is ethnotaxonomy, or the systems used by cultures to classify the natural world. This section discusses how societies view and order plants within their own cosmos, and raises the point that when modern academics discuss the plants of Minoan iconography, they are unconsciously organising them according to Western scientific principles.[39] That there are other ways to approach such human-plant interaction is demonstrated below, with suggestions about a Minoan classification of the plant world, leading to an innovative attempt to understand Bronze Age views of plants.

Humans classify their world, forming order to make sense of their surroundings. Lévi-Strauss believed that there was an intellectual demand for classification

[39] See Serjeantson 2000 for a discussion of similar problems in zooarchaeology.

shared by all humanity (Lévi-Strauss 1966: 9). Durkheim and Mauss's influential work was one of the first texts to attempt to understand humans' apparent need for order (1963). They focus primarily on kinship and clans, and how society orders itself, rather than how it orders the natural world around it, but there are still some insights to be gained from their work. A key point they make is that in systems of classification, things are not simply arranged in isolated groups, but that these groups stand in fixed relationships to each other and together form a hierarchical whole (Durkheim and Mauss 1963: 81). An example they cite from the Zuni culture serves to illustrate this point. For the Zuni, everything in the universe is classified into seven regions: north, south, east, west, zenith, nadir and centre (Durkheim and Mauss 1963: 43). West contains, for example, water, springtime, bears, grass, peace, and blue (Durkheim and Mauss 1963: 43). Thus everything in the Zuni cosmos belongs to a group, which then fits into the overall whole and maintains order. Such a system does not make sense within a Western cosmology: bears and grass do not obviously belong together. Yet to the Zuni, to include bears in the same group as another animal, such as deer, may be equally bemusing. From information like this, it can be gleaned that classification can be culturally-specific, and absorbed almost unconsciously from birth, helping societies to conceptualise the natural world.

Investigating further, it becomes obvious that there is not just one way of classifying the world. For example, a carrot can be grouped with root vegetables, or vegetables more generally, with members of the same botanical family, the *Umbelliferae* (like parsley and fennel), or even with other orange food. Here, an 'official' scientific system, operates in tandem with more informal groupings. An object, whatever it may be, does not have to be limited to just one way of understanding it. Of course the Zuni perceive the physical difference between animals and plants and colours; therefore they have one culturally-learned system of classification, as described above, and another inherent one based on perception. In Foucault's terms, order is formed through degrees of similitude, based primarily on visual perception (Foucault 1970: 136-179). Anthropological and ethnobotanical work has demonstrated that this can be applied to most, if not all, societies.

There are also ways of organising the world based not just on cultural principles, or perceptual givens, but a combination of the two. Bulmer's study of the cassowary's position amongst the Karam illustrates this point. Although a (flightless) bird, the cassowary has its own taxa, *kobity*, rather than being classed with other birds and bats, *yakt*, as might be expected (Bulmer 1967: 10). While

some physical characteristics mark it out as different, such as its large size, lack of flight, presence of furry hair rather than feathers, and heavy human-like leg bones, this does not stop other New Guinean societies classing it as a bird (Bulmer 1967: 11). Bulmer investigates the culturally-specific conditions which lead to the cassowary enjoying a unique relationship to man in Karam thought, and thus achieving its own taxonomic class. The bird is therefore classed as different both on a physical, perceptual level, as well as a cultural level. These points about physical, cultural or mixed levels of perception and classification and the implications for Bronze Age study are developed further below.

Western scientific classification systems

Attempts at systematic classification of the natural world date back at least to Theophrastus, who classified plants into four main groups: herbs, undershrubs, shrubs, and trees (*Hist. pl.* I.iii.1) (Table. 3.2). He then suggested minor divisions based on other distinctions like whether the plant was flowering or flowerless, or preferred dry or wet land (*Hist. pl.* I.iii.5-I.iv.2). He was aware however of the difficulties inherent in trying to find an all-inclusive system, and suggested one should not try to be too precise in definitions. Albertus Magnus's (1193-1280 AD) interest in ordering nature led him to develop a new nomenclature system based on natural groupings of plants with shared characteristics (Stannard 1980a: 363). This system, outlined in Table. 3.2, was never fully developed however, and taxonomy remained "haphazard and inconsistent" until the seventeenth century (Saunders 1995: 85).

The popular 'Doctrine of Signatures' provided a different way to classify plants for medieval doctors and botanists. In this belief, the first step is a recognition of a morphological similarity between a plant part and a symptom or condition of disease; from here, the assumption that such a plant is effective therapy for the condition is born (Stannard 1982: 14). Paracelsus wrote "the flowers of St. John's wort, when they are putrified, they are like blood; which teacheth us, that this herb is good for wounds, to close them and fill them up." (Arber 1938: 251). Similarity to certain animals also indicated a medicinal use, for example, *Dracunculus vulgaris*, the dragon arum, was likened to a serpent, and so considered a useful cure for snakebite (Stannard 1980b: 373). Thus plants were grouped according to their (supposed) medicinal functions. Such a system however has no place for plants without a perceived medicinal function and so is not an all-encompassing classification method. A more inclusive system was desperately needed to allow the totality of the world of plants to be adequately described.

During the seventeenth century, systems like that of John Parkinson, who had devised 17 classes of plant, ranging from "Venemous, Sleepy and Hurtful Plants", to "Strange and Outlandish Plants" (Arber 1938: 174) were replaced by those based on the stable physical attributes of the plant (Saunders 1995: 85). In part, this was spurred on by the realisation that works by classical authors were inadequate for identifying not just northern European flora, but the myriad new species arriving from overseas. The current system that the Western world uses to classify the plant kingdom is one developed by Carl Linnaeus, first mooted in his *Systema naturae* of 1735. He divided the plant kingdom into 24 classes, based on the number and arrangement of sexual organs in each flower (Barbour *et al.* 1982: 12). Classes are then subdivided into orders, followed by families, genus and species (Table. 3.2). Each plant has a Latin binomial, a scientific name which comprises the genus name and species name, e.g. *Lilium chalcedonicum*. From this it can be established that this plant is a species (*chalcedonicum*) of the genus lily (*Lilium*), which thus indicates the plant is one of the members of the *Liliaceae* family, one of the largest monocotyledon families. There was now a place for all plants in an overall system of classification, and using a common nomenclature too. It must be noted however that the discovery of sexuality among plants led to "a good deal of anxious prudery amongst those charged with educating the young, particularly the young ladies for whom botany had once seemed a suitably innocent pursuit" (Kemp 1996: 221).

Linnaeus saw the handiwork of God reflected in these apparently naturally occurring groupings (Berlin 1992: 12). He had vigourous opposition in the form of Comte de Buffon however, who believed that any clear divisions in nature were "merely impositions of the human mind" (Miller 1996: 3). This school of thought developed further in the following century, after John Locke, who believed "species have no actual existence in nature." (Berlin 1992: 11). To these relativists, species are the products of human imagination, like any other cultural construct (Berlin 1992: 11). They are not a given in nature, but created by humans to organise the world. While biologists claim to study nature "as it really is," anthropologists, on the other hand, study the ways that nature features in a cognised world (Ingold 2000: 14). These cultural concepts range from Linnaean systematics to the myriad different folk taxonomies of which anthropologists are now aware. This can be seen as following on from Locke's statement, and serves to undermine the faith placed in a Linnaean, or indeed any other, classification system. Is there naturally such a thing as 'species'? In what varying ways do humans categorise nature?

Folk taxonomy and the universals of classification

Plants can fit into a cosmology in different ways, such as in the Zuni example cited above, but there is a complementary classification system also evident, one which allows the species to be named and ordered at a basic perceptual level. That all societies name and utilise those plants which surround them, and discern levels of similarity and difference between these named plants was realised a century ago:

> "It is impossible that men, even the most primeval and unlettered, manage their affairs with ... the plant world without classifying them. Names of plants, generic and specific, and also other names more comprehensive, are part of the vernacular of every tribe of the uncivilised"
>
> (E. L. Greene 1909, *Landmarks in Botanical History*; quoted in Berlin 1992: 56).

Brent Berlin, a key figure within ethnobiological studies, has proposed some general principles of folk taxonomy, drawn from a range of societies across the globe (e.g. Berlin, Breedlove and Raven 1973; Berlin 1992). He observed that in nature clusters of similarity between plants are most easily perceived, while a finer degree of differentiation is required for subordinate categories; the generalisation needed for superordinate categories is even more difficult to achieve (Berlin 1992: 10). Recognised taxa are then grouped into a hierarchical structure, an organising principle which has been noted as common to most societies. Berlin breaks this overall structure down into the ranks of kingdom, life form, intermediate, folk generic, folk specific, and folk varietal (Table. 3.2).

In Berlin's 'kingdom' rank, there is only one member, e.g. 'plant', and it incorporates all taxa of lesser rank. This is followed by 'life form', which is based on gross morphology; e.g. among the Ndumba of New Guinea, there are 5 life forms: *foringa*, mosses, lichens and fungi; *mauna*, herbaceous plants and ferns; *muso*, grasses, sedges and rushes; *sana*, vines and lianas; *sa'tari*, trees, shrubs and tree ferns (Berlin 1992: 164). The smallest groups of plants that can be recognised without close study are known as 'folk generics', and consist of the first taxa learned by children, the most easily differentiated group. It is with this rank that the highest degree of correspondence with Western systematics is found (Cotton 1996: 262). Finally, the subgeneric ranking, or those less numerous than generics, concludes Berlin's system. There are indications that recognition of such 'folk specifics' or 'varietals' is partly due to domestication.

In local flora, the folk generics are the plants that are most easily observable, i.e. not rare, or too small, or growing in concealed locations. They will also be relatively distinct from other genera in their overall appearance. This grouping by

appearance is important, because perceptual givens are considered immune from cultural determinants (Berlin 1992: 9). This means that while there are claims for genera based on factors like pharmacological value or symbolic significance, these apparently play a secondary role behind morphology in the classification systems of most cultures (Cotton 1996: 261, Box 9.5). Theoretically, this relegation of culturally-specific reasons for groupings to a lesser status means that an outsider has as much chance as an insider to organise the natural world in a way relevant to that society. In other words, "one should be able to use Western scientific description of a given local flora or fauna as a biological road map for predicting which organisms will be named in the corresponding folk system" (Berlin 1992: 82). Thus the utilitarian method for classification, based on solely cultural uses, can be disproved as the primary deciding factor in ethnotaxonomy, although cultural significance will play a supporting role.

Folk generics are undoubtedly the most numerous taxa across societies, and although there does seem to be an upper limit of around 2000, 500 or 600 distinct recognised genera is the average (Brown 1985: Table 1). This number is obviously affected by the natural environment of the culture; arctic communities are not surrounded by such an abundance of plants as those who live in the rainforest, for example. Interestingly, many of the contents of these taxa correspond closely with those recognised in Western biological systematics (Cotton 1996: 262). Also, unsurprisingly, the number of plants classified seems to increase dramatically with the onset of agriculture in a society. Brown surveyed botanical taxa in 39 languages and he arrived at a mean of 500 named plant taxa, the range being 2131 to 56 (Brown 1985). Furthermore, he noted in 18 systems with more than 337 named plant taxa, all but one have small-scale agriculture (Brown 1985: Table 1). Also, all but one of the 21 societies with fewer than 337 plant names have a non-agricultural base; for example, the Haida Skidegate Indians of the Canadian Pacific coast recognise only 169 folk genera (Brown 1985: Table 1). Brown also notes that agrarian societies utilise binomials to a far greater extent than foragers, thus indicating a more complex system of classification emerges to deal with larger numbers of recognised plants (Brown 1985: 50-52). These broad guidelines seem to be applicable to all societies around the world. Berlin believes this is ultimately due to "human beings' inescapable and largely unconscious appreciation of the inherent structure of biological reality" (Berlin 1992: 8).

While these theories can be accepted as having some merit, there will always be criticism of attempts to form generalisations, or universals, from a range of diverse cultures. Descola points out that if all societies classify plants according to

identical procedures, but then endow them with culturally-specific values, it must be because ethnobiological taxonomy plays a subsidiary role to social reasons (Descola 1996: 85). Certainly it does seem foolish to discard all cultural values as having a role in classification; it may be more helpful to consider that societies have a simultaneous twin method, of both categorising and relating plants morphologically, and also combining them into different relations based on certain cultural concepts. Morris discusses the possibility that not all societies are necessarily equally interested in taxonomy, and that for some a classification of the plant or animal world may not relate to other cultural domains at all (Morris 1976). Ellen meanwhile notes that there will always be 'problem' categories in ethnobiological classification, things that defy simple categorisation, such as lichens (Ellen 1996: 108), or indeed the cassowary as described above. Berlin's response to this however, is that although he engages in cross-cultural comparison, he is not trying to seek a one, true universal, but rather illuminating the shared features of many societies (Berlin 1992: 11).

Minoan plant classification and knowledge

With such cautions in mind, it is worth investigating how much can be suggested about a Minoan classification system. It should certainly be assumed that the Minoans had some system of ordering their world, and that the plant life around them was part of this system. After all, to be able to utilise plants for diverse purposes, they need to be recognised and it must be possible to transmit this knowledge. Mute archaeological finds alone will not provide enough clues to gain an understanding of the Minoan view of nature, perhaps explaining why this subject has not been explored until now. However, using the ethnotaxonomic studies discussed above, it should be possible to make some suggestions about the kinds of organisation of plants in the Aegean Bronze Age. Certainly Crete, and the Aegean in general, is a place of great biodiversity; coupled with Berlin and Brown's conclusions, it would be surprising if the Minoans did not consciously name at least 500 folk generics. Furthermore, as this society engaged in agriculture, the recognition of at least 300 generics is to be expected. Interestingly, Theophrastus recognised about 550 types of plant, Dioscorides up to 600 (Stannard 1971: 170-171), providing further support for Berlin's thesis as applicable to Greece. It is also quite likely that a binomial system would have existed, enabling recall of species which otherwise are less salient (Brown 1985: 52). In fact, in Linear B, the terminology for safflower, *ka-na-ko e-ru-ta-re*, and *ka-na-ko re-u-ka*, shows a binomial system, differentiating between 'red' and 'white' safflower. Assumed to distinguish two different dyestuffs, or red dye and seed, rather than two separate plants, this practice could extend to plants in the wild

also.

This information drives home the restricted number of recognisable plants in Minoan iconography. Based on ethnobotanical theories elaborated above, it is not possible to say that the Minoans were unaware of the morphological differences between the numerous plants surrounding them, and that their art reflects a lack of perception of the different species available. What is important is that while modern commentators looking at the iconography see diverse Linnaean species, such as *Lilium candidum*, *Crocus cartwrightianus*, or *Iris cretica*, these plants could very well have been considered as folk generics, or more closely related by the Minoans.[40] That there are other ways to apprehend the natural world, rather than in divisions based on the number of stamens or petals is apparent. All three of the above plants share certain morphological similarities which could lead to them being classed together by many observers: bulbs, number of petals, even shape of petals can be alike. Furthermore, such a group of plants may have attained a special status, based on non-morphological qualities, such as pharmacological powers, or roles in mythology. Aquatic plants such as papyrus, and different types of reeds and rushes could also perhaps have been seen as more closely linked then today's botanists would say. A further possibility is the division of plants into different sexes. In ancient Greece there was an awareness of female and male plants, although interestingly such distinctions were not based as they are today on reproductive elements, but on how effectively a plant could be dominated by humans (Foxhall 1998: 68). There is no reason that the Minoan cosmos could not have been divided into male/female categories, although whether based on morphology or cultural reasons is impossible to say. Naturally, without any Minoans to talk to, all such suggestions always remain in the realm of possibility, rather than fact. However, the importance of recognising that a Bronze Age categorisation of nature is highly likely to have been different from a twentieth century western one must be underlined, and should equip the observer to think outside of Linnaean boundaries when discussing the flowers depicted.

To say that the Minoans would probably have recognised at least 500 genera does not mean that every person would have known the names for all of them. Rather that the society as a whole would have been cognitively aware of that amount of distinct genera, and of the larger groupings to which they belonged. A further key point that must be made regarding classification and naming of plants is that individual knowledge of plants and their uses and properties would have varied

[40] *Lilium candidum* is a member of the Liliaceae family, while although crocuses and irises belong to the same botanical family, the Iridaceae, they are different species.

according to status in society, as well as according to possible taboos. Healers or ritual specialists would have been familiar with more plants than other people. Many societies also delimit such knowledge along gender lines. Berlin notes that in traditional societies, women usually have better knowledge of cultivated species, while men are more familiar with wild plants (Berlin 1992: 73). This reflects the roles assigned to males and females by many societies, where males go hunting in the wilds, while women tend the fields or gardens (Cotton 1996: 77). Descola noted that among the Achuar, the males slash and burn the vegetation from the forest where a garden is to be planted, i.e. appropriate the ground from the wild, but leave the actual planting and tending to women (Descola 1997: 85). A reappraisal of the domestication of food plants in the Eastern Woodlands of the USA has suggested that women's roles as gatherers and tenders of crops should not be construed as passive, but rather as deliberate, innovative contributions to culture change (Watson and Kennedy 1998). While there is no way of knowing who weeded the fields or planted the crops in Bronze Age Crete, that such labour was divided along gender lines is probable. It has often been extrapolated from art that in Minoan society women had a closer link with nature than men, as discussed in chapter two. Suffice to say here however, that the 'nature' commentators have in mind for this female connection is not one of tamed, cultivated fields, but rather an untamed arena where exuberant plants and trees burst forth, for example on the Ayia Triadha frescoes or on some of the gold rings. It would certainly be interesting if in Minoan society women were somehow conceptualised as linked with untamed landscapes, while men were masters of domesticated land.

3.6 Final Comments

In the first two chapters of this thesis, the various methods used to investigate plant use in the Aegean Bronze Age have been considered. While palaeobotany and iconographic studies are the traditional route for archaeologists, this chapter has investigated ethnobotany as a complementary route, one which raises new questions about people-plant interaction. Although this chapter opened with a discussion of the history of studying and depicting plants in the Western world, the main focus was on ethnobotany and its potential to provide a deeper understanding of human-plant relationships in the past. There is little doubt that the questions ethnobotanists have asked are different to those with which archaeologists have traditionally concerned themselves. Too often archaeology appears to have forgotten that plants can play many other cultural roles apart from providing calories. This is where ethnobotany can be of real service to the archaeologist: in providing a reminder of the multitude of ways that plants are

involved in society.

It cannot be denied that some problems may occur when applying ethnobotanical methodologies to archaeological work. Participant interview or observation is obviously not possible for a society from the past. Yet this chapter sought to demonstrate how consideration of an "ethnobotanically-inspired" broader range of material has the potential to increase knowledge about the cultural roles of plants in the past. With reference to the Aegean Bronze Age, the plants mentioned in Linear B were examined alongside iconographic and palaeobotanical material, thus showing how many of them were probably culturally important much earlier than the Late Bronze Age. Although a search for plants in Minoan myths was not as successful, such an enterprise would be of benefit in other societies where textual evidence can help explain iconography. The collection of plant material has always been a part of archaeological research, and analysis is becoming ever more sophisticated. Fieldwork projects should be encouraged to sample the contemporary environment as well as the palaeobotanical material however, and consider local plant-based traditions. In tandem with all these methods should be an examination of the society's art, as it has been shown that plants have almost always been depicted when they are especially meaningful to the society in question.

A key point arising out of this study of ethnobotany is that questions focusing on how people in the past understood their environment should not just be deemed unanswerable and ignored. Using a combination of ethnobotanical methods as explained in this chapter, rather than relying solely on palaeobotany, archaeologists should enquire about the society's place within its environment, about plant classification or organisation, about differential plant knowledge, and many other such issues relating to the social roles of plants. Initial attempts were made to consider such things with reference to the Minoans, and it is hoped that future work in the Aegean will adopt this approach and continue to raise (and answer) new and interesting questions. The next three chapters of this thesis continue in this vein, focusing more explicitly on the various social roles of plants in the Aegean Bronze Age.

Chapter 4: The Crocus in the Bronze Age Aegean.

"For those at death's doore and almost past breathing, saffron bringeth breath again"
(Gerard's Herbal 1597)

Bearing in mind the range of beliefs and uses associated with plants which were explored in chapter three, this chapter focuses on one specific plant, the crocus, and its dried stigmas (saffron) and re-examines its role in Minoan society. A detailed analysis of the motif across a range of media (frescoes, ceramics, faience, jewellery, ivory, weapons, seals, metal and stone vessels) is combined with an ethnoarchaeological study of the production of saffron in Greece today. The information on saffron from the Linear B tablets is also included. The different properties of the spice are examined, leading to suggestions about the different social roles the plant and its by-product could have played in the Bronze Age Aegean.

The problem of identifying specific plant species in Minoan art was discussed in chapter two, and debate has raged over the many crocus depictions. The dilemma is not about what the plant is; all commentators from Evans to the present day agree that the flowers shown are crocuses. The issue rather is which precise species of the eighteen crocuses which grow in Greece (Goliaris 1999: 74) is being shown. The plant in question is usually depicted growing from a clump of leaves, with several flowers to every cluster. Three petals are normally painted, with stigmas of varying number visible in between. The flower colour varies, but most common are shades of purple or red, with red or orange stigmas. The next most frequent colour for the flower is white. The background colour of the fresco or pot obviously affects this, as to paint a white crocus on the white walls of Akrotiri would be futile. Both the purple colour and the large size of the stigmas, in some cases flopping right out of the flower, have concentrated the discussion on two species: *Crocus cartwrightianus* and *Crocus sativus* (fig. 65). That such a debate continues with vigour is due to the fact that *sativus* is the cultivated saffron crocus. If the Minoans were depicting this species, it would indicate that they had already domesticated the plant, a fact of interest not just to botanists, but archaeologists trying to piece together Bronze Age life. That the saffron was prized, and not just the crocus flower itself, is assumed from the Xeste 3 depictions of females apparently involved in harvesting the spice and offering it to a goddess figure.

Evans had little doubt that the saffron crocus was depicted in Knossian art and he had clear ideas about the importance of saffron to the people of Knossos (PM I: 265; PM IV.2: 718), and was keen to see all crocus representations as *C. sativus*. He

also saw a Linear B sign as "a flower easily recognisable from its overhanging stigmas as the Saffron (*Crocus sativus Graecus*)" (Evans 1899-1900: 30). Möbius agreed with Evans's selection of the saffron crocus, and he included it in his list of definitely identifiable plants. After morphological analysis of the examples available to him at the time, Möbius concluded that as *Crocus cartwrightianus* is probably the wild ancestor of *Crocus sativus*, variations within the depictions of crocuses do not have to be seen as two separate species anyway (Möbius 1933: 9). What Möbius might have said if he could have seen the Thera frescoes is tantalising, but their discoverer Sp. Marinatos refrained from any botanical precision, writing that the Xeste 3 women were simply gathering crocuses to provide saffron (Thera VII: 34).

Nanno Marinatos makes little reference to the uncertainty surrounding the species, and writes about saffron derived from the stigmas of *Crocus sativus* (N. Marinatos 1987: 130). Morgan also selected *C. sativus* as her identification, citing the unnatural clumps in which the plants grow as evidence of cultivation (Morgan 1988: 31). Rackham too thought the crocuses were more likely to be cultivated, although unlike Morgan's botanical reasoning, he based this on the clothing of the accompanying females, which was more suited to "a garden party rather than roughing it in the phrygana" (Rackham 1978: 757)! Douskos opened her article confidently declaring that the flowers shown in Xeste 3 are *C. sativus*, but then contradicted this initial statement several pages later, suggesting that they are *C. cartwrightianus* (Douskos 1980: 141; 143). Amigues chose to see the dispersal of plants in clumps among the rocks as an indication that the crocus is growing wild on Thera, which, combined with her morphological analysis, suggests that it must be *C. cartwrightianus* (Amigues 1988: 228). Warren provides a useful summary of the pros and cons for each different species, but introduces a further crocus, *C. oreocreticus*, into the equation (Warren 2000b: 371). Porter adds more about *oreocreticus*, but he prefers *cartwrightianus* for the Akrotiri plants (Porter 2000: 614-615). Sarpaki has recently also come down firmly on the side of *C. cartwrightianus*, stating that the Xeste 3 scene "is a naturalistic portrayal of real life in the wild, and does not in any way depict cultivation of the crocus" (Sarpaki 2000b: 661). Undoubtedly, the future will bring further developments in the debate, as newly published material tilts the balance in favour of one or the other of the various crocuses possible. Whether the Minoans distinguished between different purple autumn-flowering crocuses at all is another question, and it is suggested here that endless debate over the precise species shown may not only be futile, but irrelevant for a Minoan nature-sense.

4.1 Material Remains

Frescoes

This section gathers together for the first time all the Aegean frescoes featuring crocuses, a study not attempted since Cameron's doctoral thesis (1975), and therefore incorporates more recent material, as well as the Akrotiri scenes. In order to catalogue such images, decisions have been taken about what constitutes a crocus. The methodology employed here is twofold. Firstly, those frescoes which the excavator, or another scholar, has identified as crocuses, regardless of precise species, are included and reconsidered if necessary. Secondly, other flowers which conform to the typical crocus morphology are also included. This shape is one of three petals forming a bell or conical shape, usually with visible stigmas/stamens between, and often arising from a clump of narrow leaves. A further category of stylised crocuses is also examined. In this instance the flower appears as a jewellery motif, or on textiles, and is similar to the pendent crocus motif found on LM Ib ceramics.

In total, 32 different fresco scenes with crocuses exist (Tables 4.1, 4.2, 4.3 and 4.4). For this discussion, each wall constitutes a separate scene, therefore although, for example, the Xeste 3 saffron gathering scenes are thematically and spatially linked, they form separate entries here. Four subgroups have been devised to allow the material to be more easily considered: crocuses with figures (human or divine); crocuses with animals and landscape; crocuses as decorative motifs; and miscellaneous crocus fragments. There is a certain amount of overlap between groups, as crocuses on textiles or as jewellery appear on figures who may also be in a crocus landscape. It should also be mentioned that the fragmentary state of many of the frescoes means that the original composition can be uncertain, and so the exact motifs and layout of the reconstructed scene may not be identical to the original.

There are only two locations where crocus plants definitely appear with figures: at Ayia Triadha, and at Akrotiri (Table 4.1). Both sets of frescoes can be dated to the LM Ia period. The first scene comes from room 14 of the villa at Ayia Triadha. The 'Adorant' was depicted on the north wall, adjacent to the 'Goddess' and opposite the 'Cat' scene (fig. 36). The 'Adorant', a female, has recently been reconstructed kneeling before a baetyl (Militello and La Rosa 2000: 993; fig. 4). Although badly burnt, it is possible to distinguish lilies and crocuses growing from clumps throughout the scene. The Akrotiri scenes, in contrast, only show crocuses. In Xeste 3, crocuses appear on frescoes on two levels, on the north and east walls (fig. 66). The lower north wall in the lustral basin is the site of the so-called

'Adorants' scene, where three females are surrounded by crocus clumps (fig. 67). Directly above this is the 'Mistress of the Animals', again featuring crocuses growing across the wall, while the flower is also evident in a number of baskets (fig. 68). The adjoining east wall is, once more, dotted with crocus clumps, and two girls appear to be picking the flowers (fig. 69). To these well-known examples must be tentatively added the LM Ib fresco from the North Building at Knossos. There the Fresco of the Garlands runs along the top of the wall, while a river and some form of structure, as well as crocus flowers, feature in the main scene. Warren has suggested that the multicoloured fragments came from the dress of a large-scale female, similar to at Ayia Triadha (Warren 2005: 134-135). Therefore this fresco could possibly depict another female with crocuses.

Crocuses appear more frequently in scenes with animals than they do with human figures. Knossos and Akrotiri each have three examples in this category, and one more comes from Ayia Triadha (Table 4.2). The Knossian House of the Frescoes provides two MM IIIb/LM Ia examples: the Crocus Panel, and the Birds and Monkeys fresco. In the first of these, two agrimia face each other on either side of an olive tree, while the upper part of the scene is filled with crocus clumps (fig. 70). In the Birds and Monkeys fresco however, crocuses are but one of a multitude of plants which grow along rivers and among rocks, interspersed with monkeys and birds (fig. 71). The third Knossian fresco with crocuses is the Saffron Gatherer, possibly the earliest of all figural frescoes in the Aegean (MM IIIa according to Hood [2005: 62], although Evans suggested MM II). In this scene, a blue monkey, previously thought to be a boy, moves through a landscape filled with crocus flowers, some of which apparently grow in bowls (fig. 72). Turning to Akrotiri, the Bovines and Crocuses comes from Beta 6 (fig. 73), while Xeste 3, room 2, produced a fragment of crocuses and a swallow (Thera VII: pl.39b). The intriguing Monkeys and Swords from Xeste 3, room 4, also has crocus clumps in the background (Doumas 1992: figs. 95-96). Finally, returning to Ayia Triadha, in the scene on the south wall, cats and agrimia bound through a floral landscape which includes crocuses (fig. 74).

The crocus also features as a decorative motif in frescoes (Table 4.3), i.e. when it is shown not as a flower or clumps of flowers growing from the ground, but in a stylised fashion, often as textile decoration or jewellery. Five out of the eleven examples in this subgroup have been suggested to be from clothing depictions. The female holding a necklace in the 'Adorants' fresco of Akrotiri wears a diaphanous garment with red stigmas visible on the sleeves and bodice, remnants of whole crocus flowers whose petals have faded over time (fig. 75) (Laffineur

2000: 904). Rehak identifies the 'Wounded Maiden' in the same scene as wearing a belt with crocus buds, and the 'Veiled Girl' apparently also has crocus blossoms on her dress (Rehak 2004: 89-90). The seated 'goddess' herself wears a similar pale blue top, again with only stigmas remaining, however her garment is bordered by a strip of darker blue where the crocuses are still evident (fig. 76). One of the older women upstairs in Xeste 3 may also have crocuses on her garment (Rehak 2004: fig. 5.8). Fragments of crocus fresco were recovered at Palaikastro, and the excavators suggested they had come from a textile depiction (Bosanquet and Dawkins 1923: 148; fig. 3) (fig. 77).

Other stylised crocuses come from a variety of non-clothing contexts. Crocus jewellery adorns the neck of one of the Knossian Ladies in Blue (fig. 78). Fresco fragments from the Procession Corridor show crocuses accompanied by dots, once more suggested to be crocus jewellery (PM II.2: fig. 430). The floral garlands from the North Building should be included here too, although these crocuses are more similar to those which are normally depicted as growing (fig. 79) The ship procession miniature fresco from the West House, Akrotiri, includes so-called crocus festoons. Hanging between the mast and prow and stern of the flagship, these 3-lobed motifs bear similarity to the pendent crocus motif found on LM Ib pottery (fig. 80). Morgan considers the shape on the side of another boat to be the same motif, again a crocus (Morgan 1988: 30; fig. 14). Pendent crocuses reoccur decorating two of the *ikria* from room 4 of the West House (fig. 81). Further afield, at Tel Kabri, a string of flowers painted on the floor of the palace hall has been interpreted as crocus blossoms (Niemeier and Niemeier 2000: 776) (fig. 31). Finally, if Gesell's theory is to be believed, rather than blood on the horns of consecration in Xeste 3, the red paint indicates crocus stigmas strung across the structure (Gesell 2000: 954). Until the relevant fresco is published however, judgement ought to be reserved on this scene.

Apart from complete, or almost complete scenes, there are various small fresco fragments which feature crocuses, and which do not receive as much attention as the larger scenes (Table 4.4). Often they are just mentioned in reports, rather than illustrated. For example, at Tylissos House C, Hazzidakis noted the discovery of red crocus fragments on a white background (Hazzidakis 1934: 37). The excavators at Archanes claim that they have discovered some miniature clumps of crocuses, although as only the stems remain, it is very difficult to say that these were crocus flowers for certain (Sakellarakis and Sapouna-Sakellaraki 1997: figs. 487-488). Unpublished fragments of a crocus fresco come from Poros, and can be seen in the Heraklion Museum. The remaining fragments come from the Knossos

area. Cameron identified a miniature crocus clump at Savakis's Bothros (Cameron 1976: Fig. 3a; Pl. 3b). There also seem to be further miscellaneous crocus clumps from the House of the Frescoes, which so far have not been fitted into any other scenes. There are unidentified flowers in the floral fresco of the Unexplored Mansion, which could be suggested to be crocus fragments (Chapin 1997: pl. 43g). Finally, it is worth including here the fragments from Pylos which are remarkably crocus-like (figs. 82-83).

This section has brought together all the crocuses on frescoes from the Aegean Bronze Age, and it is immediately obvious that the flower appears in a variety of contexts: with people, with animals, on textiles and as jewellery, in garlands and possibly even on floors. Interpretations of frescoes are diverse, as explored in chapter two, but it is useful to summarise the relevant information. The Ayia Triadha 'Adorant' scene is usually understood as a ritual act, whether a worshipper kneeling before a baetyl, or a priestess gathering flowers for the 'Goddess' on the neighbouring wall (Cameron 1975: 174). That this woman may even be another goddess herself is also suggested by Cameron (1975: 174). A goddess is also posited for the female figure seated on the platform at Akrotiri, accompanied by a griffin, a creature belonging to the magical otherworld. The other females in the Akrotiri scenes have not been suggested to have a priestly or sacred role, but rather as gatherers of flowers, which are then offered to the divinity. While no specific deity can be recognised in the North Building scene, Warren postulates that the women were gathering crocuses to offer to the goddess of nature (Warren 2005: 146-147). Therefore, the limited number of scenes of human interaction with crocuses have all been thought to have ritual connections, and moreover, all feature females. As will be seen throughout this chapter, these associations occur in other media also.

Turning to the animals, it is notable that the monkey occurs most frequently with the crocus. This connection has been explored by Marinatos, who suggested the animal was an intermediary between the human and divine spheres (Marinatos 1987). Birds appear in three of the frescoes, while agrimia occur in two, and bovines/dogs and a cat appear once. Animal frescoes also exist without crocuses in them, such as the various bull frescoes from Knossos, or the Antelopes at Akrotiri. It seems then that the combination of this flower with certain animals may have been particularly meaningful. This link between crocuses and certain animals is replicated on other media too, as illustrated below. All the material demonstrates that crocus paintings appear to have been relatively widespread across Crete, that miniature flowers featured as well as larger versions, and that

the flower may have appeared in Mainland mural painting too.

Ceramics

This section examines the crocus as a motif on ceramics, ranging from some of the possible earliest examples through to the end of the Bronze Age on Crete. The broad time span is important, as it contrasts with the majority of frescoes which come from a restricted chronological phase of MM IIIb-LM Ib. Therefore the development of the crocus motif over time can be studied. However, this is not a problem-free exercise. Initially, one of the aims of this thesis was to make a complete catalogue of crocus motifs on ceramics in the Bronze Age. However, while the plant is relatively easy to recognise in Neopalatial art, problems occur when looking for it in earlier ceramics. Kamares ware in particular displays a wide range of floral motifs, some of which could be crocuses. Yet the issue of when exactly a three-lobed motif is intended to be a crocus, and when it is just a foliate image is difficult to resolve. In later periods there is also the increasing stylisation of the motif to contend with. Both these hurdles mean a complete catalogue is extremely difficult, and so this section will use select examples to demonstrate the motif's key changes through the Bronze Age.

The search for recognisable motifs on ceramics begins in the Early Minoan period, when painted decoration first appears. During EM I and EM II decoration is restricted to stripes and geometric patterns (e.g. Ayios Onouphrios and Koumasa wares). In EM III white-on-dark becomes popular, and further elements are added to the decorative repertoire, such as circles, spirals, and dots, especially in eastern Crete (Betancourt 1985: 55). These new motifs add an organic air to the previously linear-dominated ceramics, and it is out of this tradition that the use of foliate motifs emerges, and the later Kamares ware is born. To identify a specific flower in any of these early pottery styles is impossible. Yet the simple 3-pronged motifs and foliate loops are perhaps the forerunners of later floral decoration. Certainly, two MM Ia identical cups, one found at Knossos (fig. 84), the other at Mallia, could be seen as predecessors of the later crocuses, via the more developed version of this 3-pronged motif from the Town Drain, discussed below.

Undoubtedly the rise of palatial culture in the Middle Minoan period allowed the arts to flourish. While regional traditions can be identified, the pottery styles on the island as a whole form a more homogenous group than during EM (Betancourt 1985: 71). The introduction of red paint in MM Ia helps distinguish pottery from the preceding EM III, and leads to the polychromy of the wheelmade Kamares ware in MM Ib. Pots decorated in red, white and orange on

a black ground provide a medium for the huge expansion in the number and variety of motifs, and relief and barbotine decoration adds to the diversity of the style. In Walberg's classification system the Classical Kamares period, covering MM IIa/MM IIb/MM IIIa, is the apogee of the style (Walberg 1987; 1983). It is at the palaces of Knossos, Phaistos and Mallia that most "dynamic developments" in Kamares ware occur (Betancourt 1985: 96). Following Furumark, Walberg has noted the role of torsion and whirling motifs in Kamares ware, where the decoration has been deliberately combined with certain vessel shapes to obtain an overall effect, or "unity" decoration (Walberg 1987: 12). The key point about Kamares ware in this context however, is the undoubted role of plants in "the inspiration of the decoration" (Betancourt 1985: 97). Foliate bands, rosettes, petaloid loops, and spiralling tendrils cover the vessels. However, opinion is divided over whether these are really intended to represent plants, or is this a chance resemblance of select motifs? Furumark wrote of MM II ceramics that "these designs genetically have little or nothing to do with organic nature but are entirely determined by their syntactic function and by the laws inherent in purely abstract spiral decoration" (Furumark 1941: 134). Walberg follows his thinking, and believes all motifs are "ultimately based on simple geometrical figures" (Walberg 1987: 73). On the other hand, the character of a variety of the new floral motifs makes it seem unlikely that attempts to portray real plants were not behind at least some of the designs.

For example, traditionally the earliest crocus identified on a Minoan vessel comes from the Town Drain at Knossos, dated by Evans to MM Ia/b (fig. 85). Decorated in red and orange, with barbotine additions, this cup shows a schematic crocus flower, with stigmas rising between three petals, a form which becomes the standard way to depict a crocus in Palatial Crete. However, for Walberg, this motif falls into the category of "symmetric group of radiating lines", along with the cups discussed above. Surely the real debate here must be one of intent on behalf of the painter/potter. Did he/she intend to depict a crocus and so, working within the contemporary framework of geometric and abstract motifs, realised that radiating lines accompanied by some judiciously added stigmas could serve as a crocus? Or did he/she intend to decorate the cup with radiating lines, which coincidentally ended up resembling a crocus, so stigmas were then added to complete the similarity? That there are floral motifs in Kamares ware which may be similar to real plants unintentionally is probable, and Walberg seems correct in seeing these as purely abstract motifs. Yet considering the important position the crocus plays in later frescoes and ceramics, and the fact that its development as a motif can be traced throughout the Middle and Late Bronze Age, it seems

preferable to see this cup as an early attempt to depict a flower which was clearly meaningful during this period. Once this step of recognition has been taken, other possible crocuses can be evaluated, e.g. in bands on a jar from Vasiliki (PM I: 185) (fig. 87), as well as on a MM IIb/MM IIIa cup from Vrokastro (fig. 86).

In the MM III period motifs become simpler with vessels often decorated with only spirals or bands (Betancourt 1985: 197). On the other hand, there is an increase in pictorial motifs, and flowers become more obviously identifiable than in the previous periods. Lilies, crocuses and palms all feature, and there is probably a link to the increase in depictions of nature as seen on frescoes and seals at this time (Betancourt 1985: 107). A pitharaki from Phaistos (MM III) shows a probable crocus, and although the petals are more pointed than usual, the stigmas curling out over the sides help identify it (fig. 88). Equally pointy crocuses can be seen on the cup found at Akrotiri (apparently imported from the mainland), where the pinkish stigmas are hardly visible any more (Thera V: 31) (fig. 89). Both these pointed examples bear a similarity to the three-petalled flower on the Pylos fresco mentioned above, suggested as crocus or tulip by Lang (1969: 129).

During this phase, the crocus can also be found in a less pointed version, with larger tufts of leaves at the base of the flower. For example, on a pitharaki from Phaistos the flower head is much squatter than on previous examples (fig. 90), and in fact is very similar to that on a bridge-spouted jar from the Kamares Cave (fig. 91), as well as a hydria from Kommos (Betancourt 1990: fig. 30.616). The bull vase recovered from Anemospilia features crocuses inside concentric circles running around the vessel (fig. 92). These flowers, angled to either side, again are composed of three broad petals rising from a tuft of leaves. This arrangement can also be found on a globular rhyton from Phaistos (fig. 93). In all these MM III examples, the key elements present are the leaves at the base, the three petals, and the visible stigmas.

The Neopalatial period sees the development of dark-on-light as a key ceramic style. LM I motifs are more naturalistic, convey a sense of movement and even "an exuberant joy in nature" (Betancourt 1985: 123). The relationship between ceramic decoration and frescoes is obviously close in this period, and many floral motifs are very similar in both media (e.g. the lilies on the jars from Knossos and in the fresco at Amnisos). Walberg has commented that all motifs in LM I can actually be found in Kamares ware, but the change to dark paint makes them appear more natural-looking (Walberg 1989: 10). Crocuses appear in a variety of different forms, yet always remain recognisable. This is also the period to which

the majority of ceramics from Thera can be assigned, enriching the evidence with abundant vessels from the island.

Simple three-petalled flowers with stigmas occur, such as on the cup from Priniatikos Pyrgos (fig. 94) or the sherd from Knossos where the petals are picked out with white up the middle (fig. 95), while an askos from Akrotiri displays the squatter form of the flower noted in MM III above (fig. 96). A solid crocus appears on two stirrup jars from Akrotiri; while one of these vessels is totally covered in crocuses growing from stems (Thera V: pl.61a), the other merely features the flower heads around the top of the vessel (fig. 97). The stigmas start to become more exaggerated during this period, and are prominent on fragments from Zakros, Knossos and the South House (fig. 98). In fact, the stigmas, especially those from Zakros, are stylistically very close to those observed in the Saffron Gatherer fresco from Knossos, demonstrating the close link between ceramic and mural decoration, and possibly indicating that this particular form of crocus originated in the earlier frescoes and then transferred onto ceramics slightly later.

The increasingly naturalism of the LM Ia period led to a large number of crocuses which look as though they are actually growing, sprouting from a tuft of leaves in the earth. For example, there are two such representations from Akrotiri, which interestingly look as though they come from the same hand. The kymbe from the West House and a strainer from the same location both feature crocuses growing from an undulating groundline, with pointed petals and one stigma visible on either side of the centre (figs. 99-100). In fact, strainers are one of the types of vessel more frequently decorated with crocuses. Several further identically-shaped examples come from Akrotiri (figs 101-102), as well as a cylindrical strainer from the same site and a cylindrical jar from Gournia (figs. 103-104). A second Theran kymbe again has crocuses, and as on the first one, they are accompanied by agrimia and marine iconography (fig. 105). A jug from the early excavations on the island is decorated with the same agrimia/crocus combination (fig. 106). Crocuses with plentiful basal leaves are depicted on the legs of a tripod offering table, an arrangement similar to that of the narcissus on a LM Ib leg from Palaikastro (figs. 107-108). During this period the flower can also be found on a conical rhyton, a 'cupping glass', and a 'bee-hive', all found at Akrotiri (Thera V: pl. 64; Thera VI: pl. 74a; Doumas 1983: fig. 19).

In LM Ib the palatial Floral Style develops. Olive sprays and reeds are some of the better known motifs, and ivy, lilies and papyrus appear too (Betancourt 1985: 145-146). A conical rhyton from Gournia and a piriform one from Palaikastro continue

the naturalistic style of the crocus developed in LM Ia (figs. 109-110). The Palaikastro vessel also features unopened flower buds, a relatively rare phenomenon in pottery as opposed to frescoes where it is more common. A radiating crocus motif has been identified at Mochlos, although the flowers are quite crudely painted compared to others of this period, and may not actually be crocuses (Barnard and Brogan 2003: fig. 15, IB295; fig. 20, IB302). Crocuses can now be seen in the more stylised 'crocus and festoons' decorative scheme too. The amphora from Tylissos is the classic example of this style (fig. 111), but fragments have been found elsewhere, such as Knossos (PM IV.1: figs. 221-222), Kythera (fig. 112) and Keos (fig. 113). This motif is also familiar from the West House flotilla wall paintings, where it appears strung between the masts of the flagship and on the ikria (figs. 80-81). Morgan suggests this pendent crocus only occurs in contexts of the sea, be it on boats or beside marine rocks and vegetation; this association began on the Theran paintings perhaps to symbolise crocuses' role as an export product, and later became abstracted to pottery, although retaining its marine connections (Morgan 1984: 171).

The island of Kythera features a broad spectrum of crocus motifs in this period, apart from the pendent version, all on vessels apparently imported from Crete (Coldstream and Huxley 1972: 299). Flowers with wavy leaves and stalks and a protruding central petal can be found on cups and bowls, and seem morphologically close to those on the jar from Archanes and the spouted bowl from Keos (figs. 114-116), as well as on an unpublished double-jug from Poros. A third type of LM Ib crocus noted on Kythera is a detached flower head, sometimes in bands by itself, and other times alternating with rockwork (Coldstream and Huxley 1972: 299) (fig. 117). The excavators note that Furumark identified this motif as a whorlshell, but considering the crocus sequence on Kythera, they believe it more likely to be a flower "where the memory of the crocus is preserved by the protrusion of the central petal"(Coldstream and Huxley 1972: 299). This crocus head can be seen at other sites too, for example Palaikastro, where the excavators deemed it a shell (Sackett and Popham 1970: 217) (fig. 118), and Keos (Cummer and Schofield 1984: pls. 54c, 55b, 75) (fig. 119). Detached crocuses can also be noted on a large amphora from the Shrine area at Zakros (Platon 1985: 117).

After the LM Ib destructions, ceramic decoration became more stylised and flowers, although still important as motifs, are more difficult to recognise as any particular species. LM II has not been recognised as a ceramic phase across the whole of Crete, but Knossos is a good source for vessels of this period (Betancourt

1985: 149-150). The crocus is still recognisable on a cup from the Unexplored Mansion, a thick band around the vessel's upper half filled with small solid crocuses with prominent stigmas, although the three petals are no longer carefully distinguished from each other (fig. 120). A South House cup of this date has a crocus fragment on the exterior, again recognisable by the stigmas, which may have been similar to the crocus found on an Unexplored Mansion sherd: no longer growing from a groundline, but hanging as an isolated flower ending in a spiral (figs. 121-122). Of particular interest is the crocus on a sherd from room H of the Unexplored Mansion (fig. 123). Here the stigmas initially curve upwards then flop down outside the petals, in the manner in which the flower is first depicted in the earliest Linear B tablets (also dated to LM II - see section 4.2 below). The tufts of small flowers on the pyxis of the same date, also from the Unexplored Mansion, may be a stiffer version of the crocus clumps noted on Neopalatial frescoes, although this is perhaps pushing interpretation to extremes (fig. 124). Moving into LM III, floral motifs become even more stylised, and there is an greater interest in symmetry (Popham 1967: 345). Many of the floral motifs from LM IIIa are of stylised papyrus, and by the end of this period naturalistic motifs have mostly been abandoned or geometricised into new patterns, far from their floral ancestors. Crocuses certainly seem to be discarded in favour of other flowers, although the occasional example can be recognised, e.g. from Amnisos (Kanta 1980: pl. 14.3).

In seeking to trace the development of the crocus motif, it may be possible to find schematic examples as far back as MM Ia, but it is not until MM III that they become certainly plant-like, or as Walberg says, pictorialized. The important issues surrounding this chronological spread are when did potters start trying to deliberately depict a specific flower, and then, of course, why they chose to do so. There can be little doubt that by LM Ia crocuses are clearly painted, and indeed, start to diversify into those which are more naturalistic, and those which are more decorative, such as the LM Ib crocus and festoons motif. The close links between wall painting and ceramics cannot be denied, and the motif is often very similar in the two media, although it seems that frescoes may have been setting the trends then copied in ceramics. Is there a pattern among the type of vessels carrying crocus decoration? While certainly not restricted to only one or two shapes, crocuses seem to be especially appropriate for strainers, rhyta, cups, jugs and jars. Rhyta are thought to be cultic vessels, as are the kymbe and the offering table of Akrotiri, and the Anemospilia jar. Strainers' functions remain unclear, but suggestions include straining liquid, juicers, sponge holders, braziers, food steamers, food storage, aromatic production, and ritual (Barnard and Brogan 2003:

67). Cups and jars were most likely for use with liquids. It must also be stated that the vessels with crocus decoration are fine ware, and so would perhaps have had special uses beyond daily life. All these vessel shapes are also found without crocuses too, so the flower is not exclusive to any of them either. While crocuses are often accompanied by painted bands or spirals (especially in MM II-III and LM II), other motifs include agrimia, birds and marine iconography, similar to the motifs noted in the frescoes. Comparisons between Cretan and Theran crocuses suggest that those of Akrotiri were painted in a less rigid manner, often bending to the side, or sprouting from plenty of leaves, while the Cretan ones tend towards more formal arrangements. Examples from Kythera, Keos and Phylakopi (fig. 125) demonstrate that crocus iconography had travelled around the Aegean, although it does not appear popular on mainland ceramics, again mirroring the situation in frescoes.

Faience

Faience is relatively rare in Crete after 1550 BC (Higgins 1997: 129), but during the Protopalatial period it is a popular material for figurines and other models, with the majority of examples coming from the Temple Repositories at Knossos. These consist of two cists sunk into the ground in the area west of the Central Court, known as the Central Palace Sanctuary. Material found in these cists was carefully placed there rather than just thrown in as rubbish (Panagiotaki 1999: 74; 151).[39] However, that the role of the cists was simply one of storage for shrine paraphernalia is dismissed by Panagiotaki, who prefers to see the deposits as representing "the the careful collection and deliberate disposal of a mass of shrine furniture" (1999: 150).

Among the various faience objects recovered, several models of flowers should be noted (fig. 126). A three-dimensional flower with five petals, and two striped leaves, sprouting from a stem or trunk, has been called a "lily-like flower" (PM I: 499; fig. 358), a "flower of the day-lily family with characteristic upward-facing, triangular petals and sword-like leaves" (Foster 1979: 81), and a *Pancratium*, or sea lily (Panagiotaki 1999: 76). This flower is definitely not a crocus, but the photograph of it in *Palace of Minos* also includes two smaller flowers, as well as a model fruit, perhaps a plum (PM I: fig. 358). These smaller flowers, which are flat on one side, and modelled on the other, as opposed to the three-dimensional work of the larger flower, were identified by Evans as "saffron flowers", i.e. crocuses (PM I: 499). They have short stems, three petals and possibly show

[39] The date of this occurrence is uncertain, but Panagiotaki makes a case for the cists being closed in LM Ia, as they contain MM IIIb-LM Ia pottery, and have hints of the interest in marine iconography which blossoms in LM Ib (1999: 151).

stigmas between the petals - all features of crocuses when depicted in other media. Foster however sees the flowers in question as "two purple safflowers" (Foster 1979: 83). This is a problematic interpretation for two reasons: firstly, safflowers are not purple, the colour of the Repositories' specimens, but red or yellow. Secondly, safflowers have a completely different shape to crocuses, with globular heads of small spiky petals. So although Foster correctly cites the Linear B records of safflower as proof of its use in the Late Bronze Age, it seem likely that she has mistaken Evans's "saffron flowers" to mean safflower. Panagiotaki is in accord with Evans, identifying these two plants as most likely to be saffron flowers, meaning crocuses (Panagiotaki 1999: 77). Accompanying these crocuses in Evans's photograph are two flower buds, giving the impression that these are intended to be crocuses too. It could be said that they do indeed resemble crocuses before they have opened, but Panagiotaki has discovered another faience flower, a lotus, (fig. 126) which was not published in *PM*, and which the buds match in colour and with which they were previously reported by Evans (Panagiotaki 1999: 76; n.59). It seems then that they may be lotus buds rather than crocus buds, as traditionally believed.

Other crocus images come from the faience "votive robes and girdles" again found in the Temple Repositories (PM I: 506; fig. 364). Two plaques in the form of dresses both have crocuses painted on their lower part, while a fragmentary third, unpublished in *PM*, may also have had the same decoration (Panagiotaki 1999: 101; fig. 27). The largest dress has a border along the bottom of "dark brown saffron flowers" (Foster 1979: 86), and features a clump of the same flowers growing out of a small mound (fig. 127). The smaller dress has no crocus border, and the clump contains less flowers than that of the other example (fig. 128). Evans noted the influence of "Egyptian lotus clumps" in this manner of depiction (PM I: 506), although this clumping is the characteristic way of depicting crocuses growing in Minoan frescoes too (e.g. in the Ayia Triadha frescoes). Three faience girdles accompanied the robes, one of which is very fragmentary. One of them is painted with "stylised brown saffron flowers with stems curling in spirals" (Foster 1979: 89) (fig. 129). This three-lobed flower emerging from a spiral is a feature found on Kamares ware too, e.g. F408 from Phaistos (Levi 1976: pl. 126).

Other faience flowers come from a variety of locations, such as the LM Ib Treasury at Zakros, where models of fruit, a cup opening like a flower calyx, and plants with spear-like leaves were found (Platon 1985: 147). Unfortunately no further information or illustrations are given, and so it is not known whether any crocuses were found here. Mention must also be made of the faience Town

Mosaic, of which two plaques depict plants. One is identified as a spray of dark green myrtle and the other shows stems of round, dark leaves growing from a woody trunk, which have been suggested to be dittany (Foster 1979: 104; figs. 42-43). The Temple Repositories contained three faience vessels with foliate decoration, two of which are chalices featuring "fern-like" plants growing from small mounds at the base of the vessels (Foster 1979: 62; figs. 5-6). A similar vessel comes from Grave Circle B at Mycenae, and has faint traces of leaves on it too (Foster 1979:123; pl. 32). The third Temple Repositories vessel is a flask, with a "naturalistic spray of sculptured rose-leaves" trailing down from the neck (Foster 1979: 62; fig. 7). An Egyptian flower was found in the Temple Repositories also, a bead in the form of "a Waz papyrus and a *pancratium* lily" (Panagiotaki 1999: 77). From Akrotiri (Xeste 3) comes a green faience lid carved with two rows of radiating petals, "in the shape of the calyx of a *nymphaea* (water lily) or other similar flower" (Thera VII: 31-32; pl. 55b), and two underpieces for ostrich egg rhyta, each with a green rosette (Foster 1979: 152; fig. 104). Final examples of faience with floral motifs come from the later LH IIIb House of Shields at Mycenae. In this case a stemmed bowl displays a simple lotus design on the lower portion of the body (Foster 1979: pl. 36), and faience inlays of waz lilies also occur (Tournavitou 1995: 242).

Although crocuses are not the only flower to appear in faience, they do feature more regularly than other identifiable flowers. All of the crocus examples come from the eastern Repository, which Evans suggested "contained the most detailed evidence as to the character and attributes of the Minoan Goddess to whose Treasury they belonged." (PM I: 495). Other items found therein include seashells, the 'Snake Goddesses', beads, vessels, and reliefs of cows and calves. These items have all tended to be interpreted as having ritual meaning, through both their location in the Shrine Complex, and the combination of iconographic themes which are seen by scholars as indicative of Minoan religion. Evans thought that there was "little doubt that the fruits and flowers illustrated by these faience relics themselves had religious associations" (PM I: 500). Hood thinks that the lily-like flower from here was perhaps a "plant of some imaginary and no doubt sacral kind" (Hood 1994: 134). Foster meanwhile suggests that a panel was composed of the faience fruits and flowers, analogous to the one with a marine theme also found in the Repositories (Foster 1979: 81). Certainly the appearance of crocuses surrounded by other items presumed sacred, in a location presumed sacred, may indicate that this plant was held in particular esteem, or played a role in Minoan ritual, a concept also already suggested by the fresco and ceramic examples of the motif.

Jewellery

The floral world was an inspiration for Bronze Age jewellery also, most of which has been found in tombs, especially the tholos tombs of the Mesara, Mochlos, Chrysolakkos at Mallia, and the mysterious Aegina Treasure, as well as the Shaft Graves of the mainland. Prepalatial jewellery consists mainly of diadems, hair ornaments, beads, pendants, and clothing ornaments (Higgins 1980: 53). Diadem attachments often took the form of leaves or sprays of leaves (Branigan 1974: 38). Branigan's Type III diadem attachments are flowers cut from sheet metal with separate stems attached through the centre (Branigan 1974: 39). Konstantinidi notes that such "flower-headed pins secured diadems which bore holes on both ends."(2001: 25). This was apparently "in line with contemporary Oriental practice, and evidently sprang from an age-old custom of decking the hair with flowers in their season" (Hood 1994: 189). One gold flower from Mochlos Tomb II is perhaps the closest to a crocus (Branigan 1974: pl. 19, 2265), although the number of petals and their shape is incorrect. Another similar hair pin also from Mochlos is usually called a daisy, and has eight rounded petals (fig. 130), while a MM I pin from Mallia ends in a flattened flower head (Branigan 1974: pl. 19, 2095). Later evidence for floral pins comes from the mainland, where lily-headed pins have been reported from Volos tholos tomb and Mycenae Shaft Grave I (Younger 1992: 260), as well as a pomegranate-headed pin from Vapheio (Immerwahr 1989: 404). Finally, the 'Wounded Maiden' seated in the fresco of the Adorants in Xeste 3 has two pins depicted in her hair: an olive or myrtle spray, and a lily or iris, although Konstantinidi suggests the latter is "probably not in the proper place due to bad restoration" (Konstantinidi 2001: 26).

Beads and pendants also feature motifs from the natural world, such as leaves and sprays of leaves during the Prepalatial, becoming more elaborate in the Protopalatial period. Some of the earlier beads may represent specific plants. For example, Branigan calls his Type IVa pendant from Mallia "single-bladed axe", but the bead is identical to the shape known as "lotus" when it features in later art (fig. 131). However, no crocus beads or pendants survive from either of these two earlier periods, although the trefoil shapes could perhaps be seen as early crocus flowers (fig. 132). Relief beads of the Neopalatial era are yet more elaborate again, including motifs identified as lotus, lily, ivy, papyrus, palm and pomegranate (Higgins 1980: 65). These types continue in the following Mycenaean period, post 1450 BC, where the "bee type" could be interpreted as a crocus similar in style to that of the 'crocus and festoons' ceramic motif (fig. 133) .

Floral motifs are not restricted to beads only, and the Aegina Treasure includes a

complex pendant known as 'Master of the Animals' (fig. 134). It features a male in a kilt and headdress, with two birds flanking him, and strange curved objects rising up on either side (interpreted variously as bulls horns, snakes or bows), with five pendent discs. Most relevant, the figure is standing among three large lotuses, identical to the lotus bead from Mallia. A similarly elaborate pendant from a dress pin was found in a Mycenaean Shaft Grave, this example showing a female standing beneath arching branches and papyrus plants (Higgins 1997: fig. 207). A necklace from the Aegina Treasure is composed of "palm leaf beads" according to Higgins (1979: 33); however they look more like the typical lily than palm branches (fig. 135), and can be compared once again to beads from Mycenae, as well as lilies found on ceramics ranging from Kamares ware to giant pithoi (fig. 136). A necklace of different flowers can be seen on the Lily Prince fresco; whether this represents a real necklace of precious metal shaped like lilies, or a flower garland cannot be ascertained. One final relevant piece of Cretan jewellery is the silver dress pin from Mavro Spelio, tomb IX, area B (Alexiou and Brice 1972). This has Linear A inscribed on one side, while the other is engraved with tiny crocus flowers with visible stigmas (fig. 137).

This is by no means a complete catalogue of floral motifs on Bronze Age jewellery,[40] but rather a survey of the period citing key relevant examples, and searching for crocuses. While Prepalatial jewellery features generic leaves and flowers, actual species are represented in later times. Beads are probably the most plentiful form of evidence, and yet even in this category crocuses are strangely absent. With the exception of some possible trefoils cited above, the crocus beads from Isopata tomb (Higgins 1980: 76) appear to be the only example in the entire Bronze Age. Could this indicate that crocuses were not a motif suited to jewellery? Perhaps such a possibly potent flower should not be worn by humans (but then see the Ladies in Blue with the crocus necklace)? The fact that the other example of the flower is on a pin with Linear A is most interesting. Linear A, when not found on clay tablets, nodules and jars, occurs also on sacred artefacts, such as offering tables and ladles. The combination of this special script and the crocus on a high status silver pin is a further hint that the crocus might have been especially important in the sphere of religion.

Seals and Rings

Seals are one of the most abundant artefact types from the Aegean Bronze Age, and, as with pottery, a complete catalogue of floral, and even only crocus, imagery in this media is well beyond the scope of this work. A further problem encountered when dealing with sphragistic art is the small size of the images.

[40] Gold rings are considered in the next section on seals and sealings.

Morgan has addressed this issue, noting how identical elements on seals have been identified as different objects, thus demonstrating how even basic identification involves interpretation (Morgan 1985: 8). Yet familiarity with the 'rules' of Minoan iconography and culture from other sources enables interpretations to be made more safely. Thus, based on the depictions of plants on frescoes and pottery, it is possible to recognise in the seals certain plants which have been reduced to their bare essentials, to allow minimum engraving and yet still be identifiable. Thus, for example, a lily becomes simplified to two curling volutes and central stamens. However, many of the plants found on seals appear as simple tufts, and it impossible to know whether these are intended to represent anything other than a landscape backdrop for diverse scenes.

Apart from being worn as amulets, seals began to be used on Crete for administrative purposes in the middle of the EBA (Dickinson 1994: 189). These early examples are incised with geometric foliate patterns, as well as primitive animal and human figures. In the Protopalatial, seals were used an an administrative tool and motifs still include geometric designs, as well as hieroglyphic script. Similarities can be noted with the organic motifs of Kamares ware ceramics. While metal signet rings became popular during the Neopalatial, sealstone carving continued too, and has been seen to "reflect a sophisticated genius in the use of space" (Hood 1994: 219). The range of Neopalatial motifs is extremely wide, and includes animals, humans, plants, architecture, fantastical creatures, and marine fauna.

How then to search for crocuses amongst all this? Younger's classification of plants is based on scale; he uses the term "weeds" for small plants, with medium ones known as "branches and fronds" and the biggest called "trees" (Younger 1988: xix). He does not identify crocuses. It should be noted that plants occur in two main contexts on seals: firstly, as the main motif, filling the face of the seal; secondly, as subsidiary motifs in empty space around another main subject. Many of the earlier seals have a large floral motif filling the engraved side. For example, an ivory cone from Ayia Triadha, tholos A, depicts a schematic "lilienartiges Ornament" (fig. 138). Crocus-type 3-pronged motifs occur more often, although as smaller tufts growing from whorling designs, as can be seen on the steatite button from the same tomb (fig. 139). Indeed, this is very similar to Kamares ware, where 3-pronged flowers appear between spirals and petaloid loops on a regular basis. It is not possible to say whether these 3-pronged flowers are proto-crocuses, or generic flowers, a situation mirrored in many ceramics of this period too. Floral motifs as "fillers" or background to other motifs are also well nigh

impossible to pin down to any species. Marinatos has concluded that when trees, palms especially, are shown accompanying animals, it denotes a sacrifice scene (Marinatos 1986: 17). It must be said however that the number of seals and sealings where branches or tufts appear is enormous, and they are not always in association with animals or altars.

Of greater interest may be the later seals, and especially signet rings, which feature human (or divine) figures, and plants. Some of these Neopalatial rings could be worn on fingers, but others are too small, and perhaps were suspended around the neck of the bearer. The majority of these were in metal, gold in particular, which therefore allowed fine detail to be carved (Hood 1994: 219). The result was a series of complex scenes, thought to depict ritual acts. Stylistically, most rings feature LM I characteristics, and "it is, therefore, possible for all examples of these rings to be accepted as either productions of the LM I period, or so heavily influenced by LM I iconography as to be relevant to the discussion of Neopalatial imagery" (Logue 2002: 155).

One of the most famous rings is the Isopata ring, from Knossos (fig. 46). Featuring female figures, possibly four worshippers and a goddess, and traditionally interpreted as an epiphany scene, the prominent position of flowers within the tableau is notable.[41] Usually all identified as lilies (e.g. Higgins 1997: 185), in fact the plants may represent different species. The largest plant grows in a clump at the front of the scene, and is indeed reminiscent of the tall lilies on frescoes, although the precise details of the flowers are not evident here. To the right of this plant grow three further clumps, but it seems unlikely that the same species is intended as the plants are much shorter, but with more, and rounded, flower heads. In fact, they are very similar to the depiction of crocus clumps on frescoes, such as Ayia Triadha or House of the Frescoes, or indeed on the faience robes. It is possible that this could be glyptic shorthand for crocuses. If so, do they appear elsewhere?

Specific flowers, as opposed to trees or tufts, are rare in later glyptic art. Warren studied one particular motif which occurs in probable cultic scenes, a rounded object with fronds rising from the top, which he interpreted to be a representation of the sea squill, *Urginea maritima* (Warren 1984). He suggested this plant "was present in the Minoan rituals to be observed or clasped, in either way being believed to convey its magical, regenerative power" (Warren 1984: 23-24). If one meaningful plant is depicted on the rings, why not another? And indeed there are several other candidates for crocuses. The ring from a tomb at Poros depicts

[41] See Cain 2001 for a discussion of the ring's interpretations.

several figures, male and female, as well as birds and a tree in a box (fig. 140). Beneath the birds are clumps of flowers, probably crocuses, which have been suggested to function here as "symbols-determination of space and time", i.e. the awakening of nature in either spring or autumn (fig. 141) (Dimopoulou and Rethemiotakis 2000: 44; 48). On the Sellopoulo ring a clump of flowers again sprouts, this time beneath a tree (fig. 48); these too are possibly crocuses, based on the fact that they appear in a ritual scene and are comparable to other crocus clumps.

The ring from Mycenae is the only other one to feature distinctive flowers. Found in the Acropolis Tomb, south of Grave Circle A, it may well be of Mycenaean origin, because, despite featuring motifs with Minoan parallels, the composition itself is un-Minoan (Niemeier 1990: 167). Again the scene may be a goddess and worshippers, with a seated female holding three flowers, perhaps poppy capsules (fig. 142). A smaller figure at her feet clasps another plant, while the figure to the right of the scene holds more flowers in each hand. Lilies, with obvious curling volutes are held upwards, while a different flower points to the ground from her other hand. The three main protagonists also appear to have schematic pins rising from their hair, in a manner identical to the 'Wounded Maiden' from Xeste 3. While none of the flowers here is a crocus unfortunately, the scene is still intriguing for its juxtaposition of so many different floral motifs with females in a probable ritual setting.

Considering crocuses in glyptic art is not a straightforward issue, as demonstrated above. Early crocus-like motifs may or may not be intended as the plant, while later identifiable flowers are relatively rare. Once again the question of intentionality arises; is this an accident of preservation, or a deliberate exclusion of crocuses from the medium? On the other hand, looking closely at the gold rings, it seems that the crocus is included in scenes of a ritual nature. And as the Mycenae ring demonstrates, it is possible to depict other flower species in a recognisable fashion on this tiny scale. So once again, it emerges that there may be a close link between the crocus and Minoan ritual.

Ivory and Bone

Remains of worked ivory and bone from the Bronze Age are relatively scarce due to poor preservation of the material. From early in the Bronze Age, ivory was used in Crete for making seals (Hood 1994: 117). During the Protopalatial period, ivory figurines were produced, such as bull-leapers from Knossos, and Quartier Mu yielded seals, plaques and discs (Poursat 1992: 3). Neopalatial sites continued

producing carved figurines, such as the exceptional Palaikastro Kouros, but ivory was often used in this later period as a material for inlays. Mention must also be made of the finds of raw material in the form of tusks, recovered in workshops at Phaistos and Zakros (Higgins 1997: 129).

Floral motifs in ivory are not particularly common on Crete at all, and the rosettes found on the edge of the Knossos gaming board are perhaps the most well-preserved examples (PM I: 471-482; pl. V). Returning to the Knossian Temple Repositories, two bone flowers and two buds, probably inlays, have been identified as pomegranate (PM I: 496) (fig. 126). Pomegranate is a plant which was certainly important in later Classical times, through its link with the Persephone story, but is little known, or perhaps little recognised so far, from Bronze Age contexts.[42] Interestingly, pomegranates contain anti-fertility agents, and were used in the past, and currently in India and the Pacific, as a means of birth control (Riddle 1997: 40-44). A circular ivory box from a tomb at Katsamba (LM Ib) shows a bull and some men, perhaps hunting the animal, in a rocky landscape where two trees are growing. Hood describes the trees as palms (1994: 122), and the scene is similar to that of bull-catching on one of the Vapheio cups, where palm trees again feature. A plaque from a tomb at Archanes (LM IIIa) shows a goat and a bush or tree, but this may be mainland work (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 861).

It is necessary to move across the sea to mainland Greece to locate any other ivory with plant motifs. Hood notes that some of these ivories may have been brought from Crete in earlier times, or may have been carved by Cretan craftsmen on the mainland, post-destructions on Crete, but some native work is also evident (Hood 1994: 122-123). A tusk from a tomb at Mycenae is carved with an intriguing mixture of motifs: a man, a goat, a column, a bird, lotus flowers, and other flowers (Mylonas 1966: fig. 143). This LH III artefact may have been a rhyton or a trumpet (Hood 1994: 127). A LH IIIa pyxis from a tomb in the Agora in Athens shows griffins hunting deer, with a stunted tree providing some background (Immerwahr 1971: 166; pl. 32). A third example of a mainland scene is a plaque from Mycenae with a seated griffin in front of "a background of papyrus-like flowers" (Vermeule 1964: pl. XXXVIIa). However the main source of floral ivories is not carved relief scenes, but inlays. In this instance, the ivories from the LH IIIb House of Sphinxes and House of Shields at Mycenae must be mentioned. Almost 19,000 ivories were recorded from here, and while a wide range of motifs was displayed, some types were especially prevalent, including

[42] Most relevant here are the two pomegranate-shaped vessels from Phaistos (Immerwahr 1989: 403-404; Levi 1976: pl.180). See Ward 2003 for other Bronze Age pomegranate material.

lilies and ivies (Tournavitou 1992: 37; 1995) (fig. 143). Rosettes are a third common ivory inlay with floral inspiration (Tournavitou 1995: 143). Finally, ivory relief plaques with 'spiral and papyrus' motif, as well as palm trees, also occur in House of Shields and House of Sphinxes (Tournavitou 1995: 173).

Considering the ivory evidence as a whole, it is obvious that, beyond figurines and seals, little has been recovered from Minoan Crete. Of that which is known, floral decoration is limited, and within this category, crocuses do not seem to feature. This could just be an accident of preservation. However, it does seem as if the Minoans preferred to use the fine-textured ivory for figurine carving, and scenes on plaques or boxes are mostly a later, probably Mycenaean, development (and these do not include crocus plants). Inlays for furniture, boxes and gaming boards are the other main source of ivory, and while lilies and ivy obviously are popular motifs in Late Helladic times, the crocus does not appear. This mirrors the general situation in other media at this period on the mainland, and must be significant. Some interesting conclusions can be drawn from these observations. Firstly, the crocus may not appear in ivory in Minoan times because the uses of ivory (inlays, figurines, boxes) did not require, or were not suitable for, decoration with an especially meaningful plant. In the classes of artefact examined so far, the crocus does appear to be closely connected with ritual, and its symbolism may not have been appropriate for containers or furniture. It may also be suggested that the actual material itself, rather than its use, was not suitable for carrying a powerful symbol. Different raw materials are seen to be imbued with special properties or powers in many societies. For example, the Tarascans of Mexico saw gold and silver as associated with the sun and moon, and objects made in these materials (or even in these colours) embodied the sacred and were possessed by elites (Hosler 1995: 107). Similarly, white clay is used in particular Ndembu rituals, where it stands for harmony and continuity (Turner 1967: 57). Could ivory have had particular associations in the Bronze Age Aegean which proscribed it being linked with crocuses? Logue has recently concluded that Minoan stone vases appear to be specifically male artefacts (2002: 56-58), so perhaps ivory likewise had specific contexts of use.

Stone Vessels

Stone vessels were produced in Crete from a very early stage, and many examples were found in the EM II-III tombs at Mochlos and the Mesara. These vessels make good use of the natural colours and patterns in the stone, and are sometimes engraved with simple decoration. One of the most interesting types of stone vases is the so-called "Blossom Bowl". This type consists of a high-

shouldered bowl, with the exterior carved into sections resembling petals, often with a groove up the middle of each one, and sometimes with a lid (fig. 144). One suggestion is that the shape is inspired by Egyptian models (Hood 1994: 140). Over 120 of these vessels, which are almost always in serpentine, are known (Warren 1969: 14). They are dated MM III-LM I, although some survive in tombs into the LM III period (Warren 1969: 14). They are found not just on Crete, but seem to have been exported to the mainland, the Cyclades and as far afield as Byblos and Troy (Warren 1969: 15). Whether a specific type of flower is intended is difficult to tell; certainly the majority of bowls have six petals, although more and less are also found (Warren 1969: 14). Their function has not been discussed by scholars, and attempts at interpretation are hindered by the lack of contexts for about 80 bowls, or two-thirds of the corpus.

To find stone vessels with relief scenes, it is necessary to turn to the Neopalatial period, where carved rhyta became popular. The famous Boxer Rhyton, Harvester Vase and Chieftain Cup, all from Ayia Triadha, do not have any floral motifs on them. However, the Peak Sanctuary rhyton from Zakros, which depicts a mountain shrine, includes clumps of crocuses growing in the rocky landscape surrounding the sanctuary (fig. 145). An interesting conical shape is visible rising from the rocks above the crocus clump, and has not been commented upon by scholars (fig. 146). While this may be another flower, it does not resemble any which are familiar from Minoan iconography, and if a flower is indeed intended at all, it is most like the Egyptian lotus. Another option is that it represents a vessel stuck into a crack in the rocks, either a flower pot or a conical rhyton to take libations down into the earth, or even a basket to gather crocus flowers (see similar shaped baskets in the Thera frescoes). The other side of the vessel shows an altar with branches on it, seen by Rutkowski as fig leaves (1986: 81). The base of this same vessel has a rosette on it (Warren 1969: 87). A fragment of another rhyton, probably from Knossos, shows a tree behind a wall, beside a shrine building (Warren 1969: 85; P477). A male figure crosses in front of the structure. These are the only two relief vessels featuring plants.

Lamps carved out of stone, preferred to those of clay from MM III onwards, are another location for floral motifs and fall into three categories: low; medium, with small pedestal; high, with tall pedestal (Warren 1969: 49). The low type often has a decorated rim, including motifs of lilies, petals and foliate bands (Warren 1969: 50). Both higher versions tend to have plain rims, with decoration on the pedestal itself (Warren 1969: 50). No medium lamps sport floral motifs, and few of the high lamps do so, with ivy as the most popular plant in this case (PM I: fig. 249). Other

stone-carved plants include a serpentine LM II-IIIa bowl fragment recorded by Evans which was carved with foliate bands and a pattern of grain (Warren 1969: 102; P. 585). Rosettes feature on stone vessels also, especially as lids (similar to that of faience noted from Akrotiri). Three such lids came from the Knossos Throne Room, one from the Temple Tomb and one a tomb east of Heraklion (Warren 1969: 71). A tripod table from Knossos has half-rosettes for legs, and may originally have been covered in gold foil (Warren 1969: 97; P 549). Finally, a stone offering table from Archanes displays foliate motifs above the legs (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 586). Although not vessels, the two limestone half-capitals from the area of the Stepped Porch at Knossos should be included here too (PM II.2: 814-815). One resembles a poppy capsule, while the other has three distinct petals, but a precise species cannot be suggested (fig. 147). On stone vessels therefore, the amount of recognisable floral decoration is limited, and crocuses only occur once, on the Zakros Rhyton. Again though, this places the flower in a context which is recognisably one of ritual, as was noted in various other media. It also, once more, associates the flower with agrimia.

Metal Vessels

Surviving metal vessels from the EM/early MM periods in the Aegean are not especially numerous. Branigan catalogues the main vessel types (drinking vessels, bowls, dishes, jars, bottles, pans, lids and spouted vessels), but only eight vessels in total come from Cretan contexts during this period (Branigan 1974: nos. 3148-3225A). Limited to drinking vessels and dishes in silver, bronze, and lead from Mochlos, Gournia, Trapeza and Kalathiana, these pieces rarely exhibit any decoration, and floral motifs are non-existent. Bronze bowls are also recorded from Quartier Mu at Mallia (Dickinson 1994: 134). The Tôd treasure, a cache of silver vessels found in Egypt, certainly includes shapes and decoration similar to Cretan examples, and may have been made on the island in MM Ib (Higgins 1997: 38-49; Hood 1994: 154). A gold cup from the Aegina Treasure also should be included as a possible Cretan metal vessel, with its running spirals and rosette, reminiscent of Kamares pottery (Higgins 1979: figs 42-43). This overall rarity of metal vessels in the Protopalatial suggests to Dickinson that "they were occasional products by specialists in other metalwork such as jewellers" (Dickinson 1994: 136). It is thought however, that much of the fine pottery of the Protopalatial period was made in imitation of metal shapes, e.g. egg-shell ware (Hood 1994: 153). Nothing from this early phase features crocuses.

For the later Bronze Age, prior to the destructions c.1450 BC, the best source of Cretan precious metal vessels is actually the Mycenaean Shaft Graves (Hood 1994:

155). Dating between 1550-1500 BC, the two grave circles contained twenty shaft graves (six in Circle A and fourteen in Circle B) which yielded exceptionally rich grave goods, including large amounts of precious metal. Drinking cups make up the bulk of the finds, and tend to have limited decoration of non-figural type. For example, two footed cups, one from Grave III and one from Grave IV, both have rows of rosettes running around them (Hood 1994: 159; fig. 151). The silver Siege Rhyton, depicting attackers and defenders of a city, includes a grove of trees (Vermeule 1964: 100-105; pl. XIV). Many of these Shaft Grave artefacts show Cretan influence, and could be of Cretan origin, or made by Cretan artists on the mainland (Higgins 1997: 78).[43] On the other hand, there is also stylistic evidence that local artists made some of the treasures, e.g. the hexagonal gold-plated box with scenes of lions hunting amongst plants, and spirals (Mylonas 1966: fig. 139). The plants on this box include large lily-types, and palm-like branches. A bronze box with lily decoration was recovered from the Shrine area at Zakros too (Platon 1985: 125). The goblet from Shaft Grave IV is inlaid with a design of a plant pot with leafy branches growing in it (fig. 148). Similar leaves can be seen on a cup from Pylos which has an inlaid band of silver leaves and bearded men on a black background, (Demakopoulou *et al.* 1995: pl. 20).

Two particularly famous metal vessels are the Vapheio Cups, recovered from a tholos tomb near Sparta, in a context dating to 1500-1450 BC. These gold cups both show scenes in relief of bull-catching. The first cup, possibly mainland work, features three bulls, and two different types of trees: a palm tree with scaly trunk and both down and up-turning leaves, and two apparent "olive trees", between which the net is strung. A miniature palm tree can also be seen to the left of the large one. The second cup, portraying capture of a bull using a decoy cow, only features one type of tree, similar to those in the Sacred Grove miniature fresco from Knossos, and thought to be an olive. A bronze cup from Mochlos, c. 1550 BC, has a spool handle similar to these Vapheio cups, and is embossed with stylised ivy leaves (Higgins 1997: fig. 177). Ivy can be observed on a bronze incense burner from Zakros too (Platon 1985: 217), and a similar motif can be recognised on some vessels from the LM I bronze hordes recovered from Knossos, Mallia and Tylissos.

Summarising the floral motifs on metal vessels, it is obvious that evidence from Crete for all periods is rather lacking. Prepalatial metalworking produced simple, plain vessels, and the possible Protopalatial examples (Aegina Treasure, Tôd Treasure) do not have a definite Cretan provenance, although Minoan influence cannot be denied. Apart from rosette motifs, and stylised ivy, both used as

[43] See Papadopoulos 1989 for discussion on the metal from the Shaft Graves.

decorative bands on drinking vessels in the Late Bronze Age, trees are the main plant form on metal vessels. They occur as background in scenes of hunting, and also beside the town on the Siege Rhyton, all from the mainland. The trees themselves fall into two groups: palm-like trees, and olive-like trees, and can be compared with with those seen on gold rings, as well in frescoes. The plant growing on the electrum goblet is unparalleled in this medium, and perhaps bears more resemblance to some of those growing in the Ayia Triadha fresco. Yet amongst all this, there is not one crocus on a metal vessel - accident of preservation or deliberate act?

Weapons

A variety of swords and daggers have been recovered from Bronze Age contexts on Crete, as well as on the mainland. Decoration on swords is generally restricted to the hilt and grip, while daggers can have inlay running along the length of the blade. However, it is the Shaft Graves of Mycenae that provide the most abundant examples of decorated weapons. As with jewellery, ivory, and metal vessels, it is difficult to distinguish Cretan material here from that produced locally. Long, narrow, Type A swords could have elaborate decoration along their midribs, including "sacral ivy" (Hood 1994: fig. 172), as well as animals and spirals. Type B swords, shorter and wider, do not exhibit such complex decoration on the blade (Hood 1994: 175-176). Both types had ornate hilts and grips, but floral motifs are less favoured than animals, spirals, and net or scale patterns. One LM III spearhead from Phourni features foliate ornament on its sides (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 623).

Turning to the daggers from the Shaft Graves, ornate compositions (in relief or inlaid) of gold, silver and niello enliven the weapons. Again animals are popular, as on the well-known Lion Hunt dagger. But plants also occur, sometimes as background for scenes of hunting, other times on their own. One dagger from Mycenae grave V has gold lilies inlaid on the blade, and in relief on the handle (fig. 149). Another is decorated with cats chasing birds among papyrus plants, based on Egyptian hunting scenes (Vermeule 1964: pl. XIIIb). A dagger from a tomb in Messenia shows a similar hunting scene, although in this instance the plants are less recognisable (Hood 1994: fig. 180). Higgins refers to it as "a charming scene of leopards hunting in a forest" (Higgins 1997: 141). Daggers decorated in this technique have not been found on Crete to date, and no daggers are decorated with crocuses.

From the minimal evidence for floral decoration on weapons, in contrast to the

large amount of animals and spirals, it may be that flowers were simply not suitable motifs for such items. Reasons for this could vary; the majority of decorated weapons come from Mycenae, and flowers did not feature in mainland iconography as much as on Crete. Moreover, even if the weapons were made by Cretan craftsmen, they would have manufactured for their market, excluding motifs that were not in demand. However, even the weapons from the Cretan 'warrior graves' do not display floral decoration (e.g. Driessen and Macdonald 1984). It is possible also that the meanings behind certain flowers, such as crocuses, were deemed unsuitable for weapons. Those that are depicted are lilies and papyrus, the two flowers which are common in mainland iconography, but no examples of crocus weapons have yet been found.

Summary

The findings arising out of this study are summarised in Table 4.5. The most striking result is the almost total absence of crocus motifs in Mycenaean culture (the one possibility is the Pylos fresco fragment). There cannot be any doubt that the plant is closely tied to Minoan society, and possibly was deliberately shunned by Mycenaeans in an attempt to carve a separate identity for themselves. It does seem though that the flower had a special link with Minoan ritual, as demonstrated by its appearance on ritual vessels, in some ritual scenes on frescoes, on the pin inscribed with Linear A, on the Zakros rhyton, the Temple Repository faience items, and even perhaps on gold rings. Equally, its absence on weapons, metal vessels and ivory may be deliberate and possibly even reflect Minoan cosmological beliefs about the link between medium and message. Another point of interest is that the lily is the plant that appears on the widest range of media across both societies, but is especially prevalent in Mycenaean imagery.

4.2 Saffron in Linear B

Linear B, already referred to in chapter three for its potential as a source of information on plants in the Bronze Age, is discussed here specifically for the information it can provide on saffron. Admittedly, this information comes from a later period than much of the evidence considered so far. However, such a valuable resource should not be excluded, as long as due care is given to forming any conclusions about Neopalatial saffron based on the Linear B records of the following period.

While information about a variety of plants and spices comes from Linear B on the mainland, in particular the Pylos perfumed oils series (Fr) and the Mycenae spice

tablets (Ge), to date saffron is mentioned only on Crete. More specifically, it is recorded only at Knossos (Np series), and when context is known, from two findspots within the palace (Table 4.6). Some of the saffron tablets were found in the North Eastern passage, along with others listing a variety of commodities such as aromatics, textiles, chariots, and cattle, as well as details of rations and land-holding (Palmer and Boardman 1963: 129). Another 13 came from the Room of the Chariot Tablets, where other series include oil, grain, sheep, chariots, horses and armour (Gulizio *et al.* 2001: 454). There are another 38 tablets which also deal with saffron, but lack context. Placing the saffron tablets chronologically, it can be noted that those from the Room of the Chariot Tablets are now dated to LM II, several generations earlier than the bulk of the Linear B archives in LM IIIa2 (Olivier 1994: 166).

The actual logogram for saffron was identified by Evans; however, he conflated it with the sign for 'olive' leading him to see antecedents in both Linear A and Hieroglyphic script. Saffron does not appear in either of these scripts in fact. Two scribal hands can be seen in the saffron tablets, corresponding to the two find contexts. Those from the Room of the Chariot Tablets, all similarly palm-leaf shaped with rounded corners, were written by scribe 124e (Driessen 2000: 77). Those from the North East Corridor can be assigned to scribe 134. The difference between the two hands is noticeable. Scribe 124e draws a crocus with three rounded petals and long stigmas flopping out between them (fig. 150). On the other hand, scribe 134 produced a much more angular flower, accompanied by dots along the stem (fig. 151). It makes sense to see this as chronological development rather than personal style, and indeed the earlier sign bears strong resemblance to the crocus as seen in Neopalatial wall painting, and indeed the sherd from the Unexplored Mansion mentioned above (fig. 123), while the later one has the more stylised appearance of flowers in general in Mycenaean art. This certainly tallies with Olivier's remarks that the LM II tablets are "the first written manifestation of the economic and political activity of the Mycenaeans in Crete, at a moment when Minoan influence was still much more felt than it was some generations later" (Olivier 1994: 166). Could it, in fact, suggest that the earlier Np tablets were actually written by a Minoan, familiar with the crocus motif, who was now a trained scribe in the new political system?

The same format can be noted on all the Np tablets, namely a syllabic entry followed by the CROC logogram, then symbols and numerals (Driessen 2000: 77). Driessen comments that, for those from Room of the Chariot Tablets anyway, the entries list mainly West and Central Cretan place names alongside quantities of

saffron (Driessen 2000: 77). This suggests therefore that, as for numerous other commodities, the palace at Knossos was controlling saffron production to a certain extent. A key difference between saffron and other plant products though is that the saffron was measured in much smaller quantities, as indeed would be expected for the labour-intensive spice. As was originally noted over thirty years ago, the weights used for saffron are identical to those for gold (Ventris and Chadwick 1973: 130). The fact that the spice was weighed, rather than measured by volume or in bundles/baskets, marks it out from the majority of other spices measured in Linear B. Coriander, cumin and fennel, for example, all are measured by dry volume, while mint seems to be counted in bunches (Sarpaki 2001: 200). The signs are as follows, based on Driessen 2000 measurements:  , N, c.242 grams;  , RO, c.120 g.;  , P, c.20.2 g.;  , Q, c.3.36 g.;  ,QI, c.2.52 g. Saffron is never measured in the larger weights available in Linear B, the equivalents of 1 kg., and 30 kgs, and when N is recorded, it is never more than N2, i.e. c. 500 grams. Although many of the tablets displaying the saffron logogram are fragmentary, some conclusions can be drawn from these measurements. Scribe 124e transcribed weights of saffron in all of the above amounts, while Scribe 134 only dealt with N and P, according to the legible remains of the whole Np series. Does this indicate that as Mycenaean control consolidated on Crete, saffron was brought to Knossos in consistently larger amounts than in the early days? Could this then be indicative of expanding saffron cultivation on the island in the later Bronze Age? If so, it must then be asked what was happening at Knossos which triggered a greater need for the spice now than previously. Uses of the spice are elaborated fully in the following sections, and so discussion of this issue will continue below.

There has been much debate about whether or not the saffron crocus was domesticated or deliberately cultivated in the Bronze Age. Saffron can be harvested from both *Crocus sativus* and *Crocus cartwrightianus*, but to be able to definitively identify *sativus* as already flourishing during the Bronze Age would give a very early date for the plant's domestication, hence indicating its importance in society. Elsewhere, saffron cultivation has been suggested to have been underway by at least 2300 BC, but this is based solely on the name for a Mesopotamian town, Azupirano or "Saffron Town", which need not indicate the plant's cultivation (Basker and Negbi 1983: 228). M. and O. Negbi believe it likely that certainly by the Late Bronze Age, saffron had indeed been domesticated in the Aegean (Negbi and Negbi 2002). Considering the amounts of saffron recorded in the tablets, it does seem likely that it may have been cultivated at least. For example, to get N2, or 500 grams of dried spice, roughly 75,000 crocus flowers

would be required.[44] If each corm produces three to five flowers, c.15,000 corms would be needed for this 500 grams of saffron. The amount of land required for this, if all the corms were planted together in a large field, can be estimated based on a distance of 10 cm. between each one.[45] This gives a total of 121 corms per square metre, which seems perhaps too dense, and could probably be lowered slightly. Nonetheless, the total amount of land required to get the 500 grams of saffron ends up at around 150 square metres, a not unsizeable amount! Naturally, this is all hypothetical maths, and it seems unlikely that the Bronze Age saffron growers would have carved giant swathes of purple through the landscape, as is currently done where saffron is grown commercially. However, broken up into smaller plots, it becomes feasible to supply these amounts to Knossos, if the plant was deliberately cultivated.

Conversely, Sarpaki sees the amount of saffron listed in the tablets as indicative of collection of wild crocus from a huge area (Sarpaki 2001: 205). This seems slightly optimistic, especially considering the brief period during which the crocuses bloom, necessitating that all the saffron had to be collected from this enormous area in a matter of weeks. At least if grown in plots, collection and processing of the flowers can be easily coordinated to maximise the time available. One other way to explain the relatively heavy weights produced could be if whole fresh flowers were weighed rather than the dried spice. This would then entail needing a much smaller amount of land to produce the relevant weight, and so obviates the need for intensive cultivation of crocuses. It does seem a less useful practice though to weigh the product before much of it is discarded. On the other hand, if freshly-picked crocuses were offered to a deity in this unprocessed form, it might explain why the processing phase of saffron production is not depicted in the Xeste 3 frescoes (although why a complete picture of saffron production should be expected here is a function of modern expectation of narrative in art).

How much of this discussion of saffron in Linear B is applicable to the spice in Minoan times though? It is obvious from the wealth of crocus iconography discussed in the previous section of this chapter that Minoans, Therans, and probably the inhabitants of other Cycladic islands were familiar with this plant, and may have extracted saffron from it. During the early LM period, the plant may have begun to be cultivated deliberately as a valuable economic resource, especially as it requires nothing more than a transplantation of the corms, but perhaps not to the same extent as later in the Mycenaean period of control. The

[44] Based on the figure of 150,000 flowers provides 1 kilo of dry saffron, as given by Goliaris 1999, 82.

[45] This may well be too close, but is based on planting distances provided by Clark 1910 and Douglass 1732, of 3 inches between the corms.

initial LM II use of weights for small amounts of saffron seems to back up this theory, and these may well have been abandoned once cultivation on a larger scale made collection of considerable amounts of saffron easier. The change in the style of the logogram CROC may point to a Minoan familiarity with crocuses being replaced by a Mycenaean stylisation, as the plant perhaps acquired different meanings to those it had held during the first two palatial phases on the island.

4.3 An Ethnoarchaeological Study of Saffron Production in Contemporary Greece.

This section tells the story of the author's research trip to the village of Krokos, in northern Greece, to study and participate in the saffron harvest in October 2002. While saffron was grown on Crete in the nineteenth century (Raulin 1869: 238), and was one of the prize exhibits of the island at the 1855 World Fair, it no longer is cultivated on the island, necessitating a trip away from the Minoan world for this part of the research. One of the main aims of this trip was to sort fact from factoid in the world of saffron. Authors have frequently contradicted each other about key points and have confused basic terminology. The most common cause of confusion is from which part of the flower the saffron actually derives, with some saying stigmas (e.g. Douskos 1980) while others say stamens (e.g. Thera VII: 34), and some even prefer to use styles (e.g. Negbi and Negbi 2002) (fig. 152). Rehak has stated that crocus stigmas only become red when dried (Rehak 2002: 37), yet elsewhere the raw material is described as red (Humphries 1996: 20). Commentators have also been uncertain about what exactly the girls of Xeste 3 are picking: is it the stigmas (e.g. Douskos 1980) or the whole flower (e.g. Marinatos 1987: 123)? There has also been confusion about the time of year suggested by frescoes, as the saffron crocuses flower in autumn, but some of the scenes are interpreted as springtime (Marinatos 1984: 62) or summer (Thera VII: 34). By involving myself in the complete saffron process, I hoped to clarify all these issues.

The following account departs somewhat from the traditional style of writing thus far used in this thesis, and in general in academic works, and is an edited version of the full story of the experience written shortly after the author's return home.[46] It was decided to include it in this format here, in the recent tradition of more experiential narratives on archaeological topics (e.g. Edmonds 1999; Tilley 2004). This style of writing owes a debt also to that developed in anthropology. In contrast to much archaeological writing which has striven for scientific objectivity, anthropological accounts of fieldwork have tended to "actively create an understanding of it in the mind of the reader" (Sinclair 1986: 212). The discourse

[46] For a concise summary of key information gathered on this trip and its relevance to the Aegean Bronze Age, see Day 2005.

employed by individual ethnographers to emphasise their "being there" varies, but common to all is the importance of "I-witnessing" (Geertz 1988). This is the desired aim of this section, to present an experience for the reader to consume. Furthermore, such narrative follows in the footsteps of pioneering ethnobotanists, who experienced plants amongst the people who used them, and wrote of their findings in accessible formats (e.g. Mark Plotkin, Nicole Maxwell, and Richard Evans Schultes). It goes without saying however, that all the necessary information about basic crocus cultivation and saffron production is contained below, but is interwoven with more personal observations and experiences, as opposed to the normal dry explanation of such matters usually accompanying Bronze Age articles on saffron.

On a wet, grey, autumn day, I found myself on a bus trundling across northern Greece. Staring out the windows as we traversed Macedonia, I saw fields submerged under flooded rivers, enormous puddles, and soggy wisps of cotton caught in the fences, forming a trail across the country. The first half of the journey, as far as Véria, had been pretty dull, just flat, soggy fields, and an onslaught of Greek folk music and smoke washing back from the bus driver. Once we left Véria however, we began to climb steadily upwards into the mountains, leaving the dreary plains behind. Trees overhung the twisty road, and a thick, damp mist settled on everything. However, gazing into the mysterious trees, glittering and heavy with drops of rain, my spirits lifted; I would soon be at Krokos.

Krokos, its name redolent of the purple flowers I had come so far to see. This small village, about five kilometres from the town of Kozáni, in western Macedonia, is the centre for saffron production in Greece today. *Crocus sativus*, the autumn-flowering saffron crocus, was my goal. Now, there was a distinct chance that all the flowers had been drowned by the incessant rain. Back in Dublin, people had been either highly sceptical of my trip, wondering why an archaeology postgrad would spend time and money chasing flowers to Greece, or else highly enthusiastic, wondering how they could get time off their proper jobs to come too. But no one came, and so I was embarking on this expedition alone.

It can all be blamed on a comment by a lecturer back during my undergraduate degree. The class was on the wall-paintings of ancient Thera, and the comment was to do with saffron, which is shown in these paintings. Saffron, hmmmm. I knew it was an expensive spice, I knew it turned rice yellow. What I learned that day was that it comes from crocuses, and that it has medicinal properties too. For some reason this sparked something in my brain - there must be a whole world of plants and flowers out there with other uses, with important roles in other societies. This thought hibernated in my mind until I eventually went back to college to do postgraduate studies, looking at plants in Minoan iconography, but saffron and the crocus remained my first love. Recently, when I rummaged through my old folders to see what exactly I had noted down in that class years ago, I found scrawled in the margin a recipe for paella, with saffron heading the shopping list. Perhaps my first interest wasn't as intellectual as I like to remember?

The more I read about saffron for my thesis, the more I felt lured to go to and see the stuff 'in real life', rather than just in my kitchen cupboard. Could a surfeit of saffron really cause people to die of laughter, as medieval authors had believed? Was it true that it was more expensive than gold? Today the world's saffron is mainly grown in five countries - Iran, Spain, Morocco, Kashmir in India, and Greece. Even in the twenty-first century, saffron is still gathered and processed by hand, the delicate separating out of the valuable stigmas from the petals and stamens impossible to mechanise successfully. The flower itself is essentially the same as that depicted on the walls and pottery of the Aegean four thousand years ago. Surely firsthand experience of the harvest would give me an advantage over all those other archaeologists who made grave pronouncements on saffron in the Bronze Age, without ever leaving their swivel-chairs. I hoped to learn as much as possible about the cultivation, processing and use of saffron, and while admittedly I was in 21st century Greece, there were enough constants for at least some of the information to be applicable to Bronze Age studies.

I had decided that rather than surprise the saffron farmers by turning up unannounced, I would try to get in touch with them before arriving in Greece. A few hours of searching on the internet produced an address for something called the Αναγκαστικός Συνεταιρισμός Κροκοπαραγωγών Κοζάνης. With the help of my Greek teacher, who wondered could it really mean 'Compulsory Co-op', a letter was composed explaining who I was, and my interest in saffron, and my hope to visit during the coming autumn. Then I dropped it in the postbox, and wondered would that be the end of it. But in September, out of the blue, an email arrived:

We have received with many thanks your kind letter of last August.
We apologise for delaying our reply to you so far.
You will be welcome here in Krokos during our saffron harvesting season, which we expect to start by October the 20th.
Please be so kind to advise us about approximate date of your visit.

Now as I approached Kozáni, I wondered whether the enigmatic Rita Gola would remember our email correspondence, and indeed, what would she be like? I loved the idea that she might be an old Greek grandmother, with hands gnarled from decades of picking crocuses, but who somehow understood computers.

Kozáni was a total mystery to me when I arrived. The place is not listed in the travellers' bible, 'Rough Guide to Greece', and indeed the whole area where saffron is farmed is dismissed with *"Macedonia's southwestern reaches, around Kozáni, are less interesting, despite some fine views towards the natural barrier of the Píndhos mountains"*. Thus I was denied the usual town plan, a list of places to stay, eat and drink, and points of interest in handy digestible form. My first task here was to find the Hotel Anessis, recommended to me by Rita, as there was no accommodation in Krokos itself. After getting directions at the bus station, it soon became clear that Rita had omitted to mention that Kozáni was built on the side of a mountain. All roads led up, steeply. Eventually me and my rucksack found the hotel, and sorted out a room, luckily heated, as it was much colder here in the mountains than it had been down in Thessaloníki.

As I pottered around town on that first afternoon, I quickly realised that I was the only foreigner in Kozáni. It seemed quite possible that I was the only foreigner to ever visit Kozáni - one open hotel, one taverna, some very confusing signposts, and lots of stares from the locals. It was the saffron farmers I had come to investigate though, and so my first goal was to discover how to get to Krokos. As it turned out, the bus went every hour, on the hour, from the square where my hotel was. Deciding I might as well go and

see what was to be seen in Krokos, I hopped aboard the 3 o'clock bus, and along with some amused-looking locals headed down from the eyrie of Kozáni towards the fields. In actual fact, the journey takes all of 10 minutes, but we did have time to pass some small fields of bedraggled purple flowers. My heart fell - I thought that either they had all been drowned by the recent rain or that I had come too late and missed the harvest. Certainly these weren't the acres of purple I had been expecting. Alighting in the village square by the church, all was quiet. Of course, it was in the middle of that period when everything in Greece stops for a few hours before the evening buzz descends. I asked at the kiosk where to find the saffron co-op, and was directed down the hill, but advised that it was only open in the mornings. Wandering down the narrow road, something purple caught my eye on the ground. It was a petal. In fact, there were lots of petals, drifting about the gutters of the deserted street, larger congregations outside some houses, a few coloured wisps in other corners. This brought a smile to my face - I was heading the right way. Turning the corner, I looked across the dip in the road, and there opposite me, nestled on the hill and catching the afternoon sun, was a yellow and purple building - the Saffron Co-op of Kozáni (fig. 153).

There was an hour to kill before the bus returned to Kozáni, so I decided to stroll around the village, looking for more traces of saffron cultivation. Clambering up a hill outside the settlement I found wild, pale-lilac crocuses growing in the undergrowth, one of the many other species of autumn-flowering crocus which grows in Greece. By the side of the road, there were enormous piles of purple petals, in varying stages of decomposition (fig. 154). There is no use for the discarded petals as of yet, but I later learned that they were being investigated to see if any useful essential oils could be extracted. In the past apparently, they were used to dye cotton and wool. Later, wandering out the other side of the village, I saw my first fields of flowers in the distance, with a few figures bending, shuffling and rising slowly, the dance of the crocus-picker. However, I decided to make myself known to the co-op the next day before approaching the farmers, and so turned for home. Around me, the peculiar, heady aroma of saffron wafted skywards, as behind closed doors the villagers began the evening work of sorting and drying the day's crop.

Producing saffron is not easy work. The flowers bloom for a few weeks in October every year, when every man, woman and often child spends from daylight till dusk in the fields. The crocuses must all be picked by hand, with the blossoms pinched off between thumb and forefinger just below the corolla. They are first gathered by each picker in a kind of apron-like pouch, which is then emptied into a communal wicker basket or sack (figs. 155-156). These types of containers ensure that the delicate flowers do not get crushed. When the baskets are full, the men drive them back to their house, where the processing can take place. (I noticed that most men tend to spend a lot of time driving around in their trucks, while the women stay working in the fields!) Flowers must be processed the same day, or it becomes very difficult to separate out the stigmas. Each saffron cultivator, whether they have only one field or many, processes his own crop, and then brings the finished product to the co-op. It really is a 'compulsory' co-op, in the sense that anybody who grows saffron must sell it through them. The co-op was developed in 1971 to ensure better prices for the product, and to try to keep the profits in the region. It has been very successful, and Kozáni saffron is now trademarked and has an ISO certificate of quality, and is available abroad.

The next morning I got up early to head to the co-op and introduce myself to Rita. As I came down the hill, things seemed more lively than the day before. There were a number

of pick-up trucks parked outside the co-op, and much to my excitement, some of them had large baskets full of flowers in the back. I followed the general hubbub inside, and found myself in a reception area, heaving with burly farmers, each clutching a number of plastic lunchboxes which were packed with red saffron threads. After some mumbled "*kalimeras*" and a variety of glances, ranging from the mildly curious to the openly baffled, they stopped paying any attention to me, and got back to the serious business of weighing the saffron. I didn't know what to do. Who should I talk to? At first I thought I'd wait till the farmers went away, and then maybe I could find Rita, so I sat down on a bench. But they kept arriving in droves, lining up with their lunchboxes, and I realised I was being subtly queue-jumped. Nobody asked me what I was doing or wanted, and I wondered how to start my great fieldwork project. Then, the sea of bodies parted, and in the middle of the throng, I made out another woman. A small figure, with tight light-brown curls, was rapidly checking the contents of each box. Her yellow-stained fingers rectified the farmers' errors - many of them had jammed the boxes so tightly with saffron that they were practically solid. They stood by, looking vaguely embarrassed that they hadn't done it right, and concerned for their precious crop, and yet simultaneously trying to be nonchalant. This gnome-like wielder of power had to be Rita.

After introductions (she had forgotten I was coming, and thought I might belong to the group of Germans she was expecting that day), Rita took me on a whistle-stop tour of the co-op. It was very modern and spacious, with rooms for packing the crop, rooms for meetings, rooms with machinery for scientific testing and making powdered saffron, display cases of goods produced, and a few offices, but no people. Usually it would be busier, but everyone was out in the fields at this time of year, Rita explained. All the while I couldn't help wondering whether it was just the light or did Rita have a kind of yellow hue to her skin? Is it possible that working with saffron on a daily basis can turn you yellow? Images of orange-skinned Oompa-Loompas dancing around Krokos rather than Willy Wonka's Chocolate Factory had to be rapidly forced out of my mind. Returning to the weighing area, I explained that I'd like to go out with some farmers to the fields. By now, however, just two candidates remained; an incredibly decrepit old man, and a younger guy with blue overalls. Rita sized them up, and, thankfully, asked Mr. Overalls would he take me along.

Soon, we were bumping along the mud tracks in his red truck, heading towards the crocus fields. Conversation wasn't exactly flowing, but I managed to explain my research, and to discover that Gregori was married with kids. It didn't take long to get to the field though, where I was welcomed by Frederika and Alexandra, two old black-clad sisters, and Stella, Gregori's sister. They were surrounded by row upon row of crocus, working their way up the field, harvesting in an orderly line. We first had introductions and coffee from their flask, and they insisted I take a croissant for later. Although I feared it might have been somebody's lunch, they put it in my bag when I hesitated. It was all great fun - we took lots of photos of everybody in different poses, laughing, and they showed me how to pick the flowers. They dug up some bulbs for me to see, which they called "*patatas*"; we moaned about how painful all this bending was on the lower back and legs; they told me saffron was good for strong hearts and fertility. Frederika gave me a little bunch of flowers, for pressing when I got home, she directed. Gregori explained how the bulbs last for no more than seven years, and then the field would be dug up, and not planted with saffron for another ten years or so. He also pointed out how the leaves only appear after the flowers have bloomed, an unusual

feature for a flower. I think they all privately concluded that I was totally insane.

I was willing to stay there all day, helping out and chatting, but I could see Gregori wanted to get on with his day's work, yet felt responsible for me. Reluctantly I said my goodbyes, and quickly tried to think of things to talk about on the way back. In fact, the journey back was more confusing than the way out. I really wanted to see the separating of saffron from the flowers, which goes on at home in the evenings. But the result of that conversation seemed to be that Gregori was going to meet me for a coffee at 11 that night, which wasn't my aim at all. After much frantic dictionary consultation, I disembarked at the co-op, not quite sure if I had cancelled the coffee, or arranged to see saffron separating, or maybe even agreed to elope with Gregori. He looked equally confused as he drove off behind me, and I resolved to go over my Greek that night.

The next day I intended to skip the truck drive and hike around the fields myself, talking to the farmers and pickers, but things did not go according to plan at all. After being surrounded by eight slobbering, howling, starving farm dogs, then rescued by a family in a pick-up truck, I ended up being driven back to Kozani, with nothing to do but be thankful all my fingers were still attached and to plan for the next day. I wanted to get some photos of the co-op in action, and so returned there early the following morning to catch the farmers at the weigh-in. There was the usual bustle, with Rita aided by a red-overalled helper, Dimitri. Once the boxes had got past Rita's inspection, Dimitri weighed them (fig. 157). Then in a handwritten ledger, the weight was carefully noted, minus that of the boxes. The co-op provides the boxes, so the price of these is subtracted from the farmer's final payments. The farmer receives 200,000 dr. per kilo (c.€ 585) for his saffron. However, when you realise that it takes about 150,000 flowers to make this amount, all hand-picked, and processed, it is no wonder saffron is the world's most expensive spice. This year the co-op was conducting an experiment in freeze-drying the crop, so after weighing, box upon box of red threads was packed into deep freezers. Most of the product is exported, a large proportion bought in bulk for use in, for example, the drinks industry. The locals do not use saffron much themselves, although this has increased in the last few years. However, everyone I quizzed about it knew that it had various medical benefits as well as being good in cooking or alcohol. I was also offered saffron tsipouro and saffron mountain tea, both excellent tonics for lifting the spirits. Yet when I wanted to buy some *Kro/koj Koza/nij* to bring home, it proved quite tricky. None of the shops in Kozáni that I went to stocked it. Some of the shop assistants I asked did not know what saffron was ("did you use it in baking?"); others nodded when it was mentioned, but no, they didn't sell any. Rita told me that it was stocked in a paint shop in Krokos. In the end, I bought it in the Folklore Museum, where they kept some under the counter beside the yellowed postcards and lumps of rock they also sold.

Another day passed, spent at the co-op, talking to Rita about the saffron cultivation, and watching some promotional videos they had produced. Traditionally this part of Greece has strong links with central Europe, and in the 16th and 17th centuries experienced a huge wave of emigration to these places. Originally these travellers were migrant seasonal workers, but over time they became merchants. The cosmopolitan attitudes that travelled back with the traders from cities such as Vienna and Budapest helped to give Kozáni a certain cultural sophistication, and it grew into a prosperous town. Not only did the merchants bring a new mentality however, but new crops. This is how saffron, a relatively common crop in Europe at this time, began to be cultivated

in the Kozáni region. The region's altitude (710 m.a.s.l.) meant that the climate was not too hot, there was rain at the right time of year, and the soil suited the corms. In the days before the co-op existed, farmers would rely on merchants buying their crop from them, often at poor prices. Saffron was stored as a kind of emergency capital, to be sold if some extra money was needed, for a doctor for example. The advent of the co-op ensured fair prices, and a certain standard of product, but the downside is that as there is no longer any competition, and everyone will get paid, farmers do not seem to care so much about producing the best crop.

After several days in Krokos and Kozáni, I had learned a lot about saffron culture in the area, I had seen fields of flowers, I had talked to farmers and harvesters and co-op people. But I still hadn't got to see the processing of the crop in the evenings, which would entail getting an invitation into somebody's house. And I still felt that I hadn't seen the enormous fields of flowers I had heard so much about. Yes, I had been to some fields, but somehow they seemed insufficient. They were quite small, squeezed between fields of grain, or behind people's houses. Lots of people just grow a few fields of crocuses to supplement their income, but I wanted to find a real godfather of saffron.

I returned to Krokos in the late afternoon of the next day, resolved to find a suitable source. It was hot, and I loitered in the square in the shade of the church, from where I had a good view of the centre of the village and the roads leading in all directions. The afternoon was still, a silence broken only by the sloshing of water coming from a woman scrubbing her hall, sending wet cascades out into the street. Everyone was in the fields or asleep. Some time passed, and then I heard the drone of a motor approaching the square. Hoping it would be a farmer, I prepared my speech. Sure enough, a white pick-up rounded the corner, and stopped outside a house opposite me. I caught my breath - in the back were four enormous baskets full of crocuses (fig. 158). I hesitated, unsure about how to approach what was obviously a very busy man. Then I thought of returning to Ireland without seeing the processing, and, gulping, I stepped out of the shade towards the truck.

Standing beside the unloaded baskets, I waited for the farmer to re-emerge from the house. Across the road, was a *periptero*, the kiosk that sells everything and adorns all Greek street corners. A tiny, wizened, black-dressed creature was staring at me, so I waved, and, camera in hand, wandered over to explain myself. It turned out she was the farmer's mother. Then Giorgios, the farmer, appeared, and we had introductions all round. He was the first person to seem totally unfazed by my interest in his flowers, and beckoned me to follow him inside. We descended into a dark, warm, aromatic cellar, where he was stacking the baskets. Sunlight jagged across the floor from a little window at street level, illuminating a mysterious apparatus in the centre of the room. This was it! This was where the processing began. I asked when he was going to start work here, and to my joy, he said straight away. And of course I could take some photos, would I like him to turn on the light to make it easier?

In Krokos they separate the petals from the stigmas and stamens using an electric fan (fig. 159). This can be done by hand, but obviously it is far more time-consuming. In the past a bellows and a goatskin blanket were used, the stigmas sticking to the goatskin, and the petals blowing away. Now handfuls of petals are thrown into a revolving drum, with a spiky mat on the bottom (fig. 160). A fan blows cold air onto this, and the fragile petals are blown off, and swept down a chute into a waiting basket. Every so often, the drum is stopped, and the stigmas and stamens that have stuck to the mat are

carefully tipped into a bag, awaiting proper sorting later on (fig. 161). As I watched Giorgos through my camera lens, I was struck by the colours of the afternoon; the fluttering handfuls of purple in the breeze, the vivid reds and yellows inside the drum, the gloomy background of the cellar, and the streaks of sunlight punctuating the scene. After a while he stopped, covered in sweat, and asked me would I like to see the ovens. Normally, saffron is dried in ovens here. Now they too are electric, but in the past charcoal kilns did the job. Row after row of fine mesh screens were lined up inside an enormous oven, each scattered with saffron (fig. 162). The smell was wonderful, but very strong - not something I would like to breathe constantly. Giorgos explained that it took about six or seven hours to dry the crop, which would then be taken to the co-op. Later we had some coffee on the steps outside, and he said that if I came back after 6 o'clock, I could go out to the fields with his brother, Dimitri. Giorgos returned to his work, which he said could keep him up till 2 or 3 a.m. at this time of year, and I attempted to chat with his mother. Unfortunately, neither of us could understand what the other was saying, but we got along famously, nodding, laughing and chatting away in two totally separate conversations.

When the sunlight was turning a warm gold in the early evening, I returned to Giorgos's house. Dimitri was waiting for me, and so I clambered into yet another pick-up, and we headed out the opposite side of the village. Dimitri was older than Giorgos, in his sixties, and much more talkative. He told me that the brothers farmed fifteen stremma of crocuses (a stremma is a Greek measurement of land equalling 1000m^2.) So it seemed I had found myself the saffron godfathers after all. The roads got worse and worse, full of enormous holes which we disappeared down into, and the route was twisty-turny. I would never have found my own way there, even if I had access to my own transport. When the village of Ano Komi was visible in the valley below us, we branched off to the left and suddenly, unfurling before my eyes like some rippling purple flag, was an entire landscape of crocuses (fig. 163). Enormous fields, stretching as far as I could see, were dotted with small bent-over figures. Every now and then, the total flatness was broken by a small, white canvas shelter - the field toilets. Nothing else rose up to break the harmony of the purple carpet, no trees, no buildings. With the sun setting behind the mountain at our backs, a golden glow dusted everything - it was beautiful. Now I knew why the other fields hadn't satisfied me - this was the real thing.

Dimitri had come to take his crocus pickers home, their work in the fields done for the day. I went down into the fields to meet them, seven boisterous ladies, steadily moving through the flowers, disturbing the odd sleepy bee (fig. 164). Once again, I was instructed in the art of picking crocuses correctly, but was a lot slower than the others. I wanted to get a close-up photo of somebody's purple-stained hands snipping off the flower from the stem, but they wouldn't even slow down long enough for me to catch one. Nobody seemed to want to pause, probably because the great stretch of field still to be harvested was plainly visible to all. After the last rays of the sun had gone, all nine of us piled into the pick-up, and we bounced homeward, sucking boiled sweets and rubbing our sore muscles, as I carefully tried to avoid crushing the bunch of flowers Maria had given me.

It was obvious that everyone was exhausted after the day's work, but it was still only half-done. Now they had to begin the painstaking sorting of the bags of red stigmas and yellow stamens which Giorgos had already winnowed out from the petals. We all crowded into the small kitchen for cigarettes and coffee, and I did my best to answer everybody's questions about my work. I passed around a book I had brought with me,

containing pictures of the Bronze Age wall-paintings and ceramics which depict crocuses. The women seemed to be aware of them already and were not surprised that saffron was collected thousands of years ago in a similar manner to today. We pressed my bunch of flowers in between the pages, appropriately enough staining the Thera frescoes with some real saffron extract. I now had so many little presents of bunches of crocuses that my hotel room was beginning to look like a botanic garden, and all my books were filling up. The hotel cleaning lady must have been baffled by the mountains of petals in the bin every morning - the result of my attempts to use up the flowers everybody gave me by drying my own saffron on the radiator.

Much revived after the break and some of Panagiota's *spanokópita*, work recommenced. A bag of yellow and red was upended on the table, and everyone pulled a pile of threads in front of them (fig. 165). This was then checked over for foreign bodies, such as stones, stray petals, and even caterpillars. When this was completed, the reduced pile of clean stigmas and stamens was tumbled onto a plastic mesh. A violent shaking caused most of the stamens to fall through onto the table, leaving the pure saffron behind (fig. 166). After disposing of the waste, we once again trawled through the pile, carefully picking out every stray yellow stamen. I could see why Giorgos's mother had cited bad eyesight as her reason for no longer doing this work. It certainly called for sharp eyes, and the women would often lean across the table to remove a bit of dirt that they could see somebody else had missed. I was sitting between Areti and Paraskevi, and I could see Areti kept missing bits, but I didn't want to annoy her by picking at her pile all the time, so every time she picked something from my pile, I returned the favour. In no time, my fingers were orange-stained by the wet stigmas. As the night wore on, the lunchboxes beside us slowly filled with pure red saffron, ready for the co-op. The men drifted in and out, but never joined in, and old Giorgos's mother sat in the corner, supervising everything and grinning at me. When I eventually left to get the last bus back to Kozáni for the night, there was still a mound of sorting to get through before the others could go to their beds. And the next day they would have to do it all again.

My time in Krokos ran out pretty quickly, and I soon found myself back on the bus, musing over the things I had seen and learned. My bag was stuffed with mementoes - pressed flowers, my own home-made saffron, leaflets about the co-op Rita had given me along with some different size jars of saffron and some powdered saffron, as well as a recipe book for saffron (in Greek). I had an empty film canister filled with red stigmas too, which old Dimitri had swept off the weighing-table at the co-op and carefully poured from his calloused farmer's hand into my own tiny palm, as though it were gold dust. I suppose in a way it is, providing income and employment for so many families in this part of Greece. And I had rolls of film, a visual record not just of the fields and the flowers and the spice, but of the people who had patiently put up with my questions. I know they all thought I was mad, but that didn't stop them from explaining simple things to me, or from sharing their lunches and their pick-up trucks with me. I had learned a lot, and now the task was to return home and apply it to my research.

4.4 Exploring Saffron

While the contemporary Western world is probably most familiar with saffron through its role in cookery, the spice has a whole host of other uses. This section discusses these uses and weighs up the evidence that they may have been known in the Bronze Age. While saffron is discussed under various headings, the

categorisation employed must not foster assumptions that such clear-cut divisions existed in the Bronze Age. It is quite likely that there would have been overlap between such categories, and with the sphere of ritual also.

Medicinal

The medicinal uses of saffron have recently begun to be explored by Aegean archaeologists, especially in connection with the Xeste 3 frescoes, and saffron's possible role in a Theran pharmacopoeia seems to expand on an annual basis. N. Marinatos was one of the first scholars to highlight the role of saffron as a medicinal substance, although Cameron had previously touched upon this aspect of the spice too (Cameron 1978: 582). Marinatos mentions it "can be used as a drug and is considered a painkiller during menstruation" (Marinatos 1984b: 65). Saffron's anodyne qualities are known in many cultures around the world, and have been documented in the Mediterranean since the ancient sources began writing. For example, in Assyrian medical tablets, *azupiranu* is referenced 18 times (Campbell-Thompson 1924: ix). Ayurvedic and Chinese traditional medicine also rely on saffron for its painkilling properties, and many societies have used it especially for gynaecological problems.

Saffron, in fact, has been used in preparations ranging from emmenagogues to abortifacients throughout the ages. Pliny the Elder's *Natural History* is rich in such gynaecological uses for the spice, including its value in relieving "suffocation of the womb" (XXI: 139); how saffron and leek juice combined with hare's rennet eases afterbirth, and a pessary of saffron in raw wool brings away a dead foetus (XXVIII: 248); and eating snails with saffron can hasten both conception and delivery (XXX: 126). Riddle's study of contraception and abortion up to Renaissance times includes numerous recipes featuring saffron. For example, Aëtius of Amida, a sixth century physician, has the following oral contraceptive: "one drachma of aloes, three obols of wallflower (or stock) seeds, two drachmas of pepper, and two drachmas of saffron. Give in wine divided into three equal parts and administer immediately after the cessation of menstruation" (Riddle 1992: 95). Saffron occurs in Primerose's seventeenth century treatise on women's diseases as one of the substances to stimulate menstruation (Riddle 1997: 151). More recently, it featured in a remedy for amenorrhea from 1847: iron, absynthium and syrup of saffron was made into a paste, out of which pills were formed to be taken three times a day (Riddle 1997: 230). Its use as an abortifacient has decreased however, due to the number of fatalities recorded (Basker and Negbi 1983: 229). That all these folk remedies are not totally illogical has been demonstrated by the fact that *Crocus sativus* belongs to a group of plants which

contain substances that copy female sex hormones (Ferrence and Bendersky 2004: 216). In summary, "under certain conditions, the phytoestrogens, terpenes, and prostaglandin-like chemicals in *C. sativus* and saffron exhibit properties which potentially control metrorrhagia, induce labor or abortion, etc." (Ferrence and Bendersky 2004: 217).

These powers of saffron were partly what led Marinatos to posit an interpretation of the Xeste 3 frescoes as representing female rites of passage linked to a spring time renewal of nature (Marinatos 1984b: 73-84). Rehak, on the other hand, finds her puberty rituals too simplistic, and prefers to see the frescoes as "outlining the importance in Aegean society of successive rituals of maturation for women of all ages with reference to a specific goddess, localizing each stage within a more inclusive society of women" (Rehak 2002: 48). He believes that women's understanding of saffron's medicinal powers, in particular its gynaecological aspects, was a source of power and allowed them to "experience a personal control of their bodies and thus their lives" (Rehak 2002: 50).

On a different note, Young Forsyth more recently focused on the link between saffron and curing diseases of the eye. She suggested that a combination of noxious gases from the volcano and the "wind that whips sharp grains of tephra into the eyes" would have produced eye inflammations amongst the ancient inhabitants of Akrotiri (Young Forsyth 2000: 158). The red-streaked eyes of many of the humans on the frescoes is taken as a manifestation of this plight. Saffron may have been used in topical applications to relieve such symptoms (Young Forsyth 2000: 159). Certainly in various medical writings, it is often cited as being useful for treating eye problems. Pliny, Dioscorides, and Galen all include the spice in recipes for eye ointments, and a Saxon book of AD 900 prescribes it for "dimness of the eyes" (Humphries 1996: 150). But that the crocus held such a prominent place in Theran and Cretan iconography for so long based solely on its eye-soothing properties seems dubious.

Rehak also noted the red eyes on the frescoes and again connected this phenomenon to saffron, but with a different conclusion to Young Forsyth. Red eyes can be indicative of vitamin deficiency, specifically vitamins A and B (riboflavin), and it is this which Rehak sees reflected in the frescoes (Rehak 2002). These are the very same vitamins in which saffron is rich. He sees red eyes as a feature of males in particular, and so concludes that men had a lack of these essential vitamins, while women did not. His conclusion: "the Theran women not only cultivated and harvested the crocus and supplied themselves and their

dependent children with the saffron, but since the red eyes of males apparently indicate that they had low levels of vitamin A, they also denied men access to saffron" (Rehak 2002: 50). There are a number of problems with this interpretation, which so far has only been criticised in print once. A summary of the main problem with Rehak's theory is succinct and damning: "It would take at least eleven people working ten hours a day for a month to harvest the saffron needed to supply seven percent of the riboflavin and one percent of the vitamin A for just one nine-year-old girl" (Waterhouse 2003: 408). Furthermore, such calculations are based on consuming 25 grams of saffron a day, an amount which is actually lethal (Waterhouse 2003: 408). Another problem with Rehak's idea is that there were plenty of other sources of vitamin A available in the Bronze Age diet, such as leafy greens and liver. Furthermore, naturally occurring deficiencies of vitamin A are extremely rare within any sort of balanced diet (Pitt 1979: 82). It could also be asked if red eyes are depicted, why not other obvious (albeit unattractive) signs of the deficiency such as scaly skin, abscesses and stunted growth? Furthermore, Rehak does not provide an explanation why other women in Bronze Age frescoes from Akrotiri, Mycenae, Pylos and Tiryns all have red-streaked eyes (Davis sees this an an indicator of maturity [Davis 1986: 404]). And then why would women feed their male children saffron initially, and then stop and condemn them to a life of eye trouble? Finally, how exactly could the women stop men from just taking saffron by force if they needed to eat it so desperately? While Rehak may have a point about saffron's vitamin content, it seems more likely that this was an incidental benefit of any consumption rather than the sole aim of cultivating the crop.

Several further medical uses of saffron must be mentioned here, although they have not been claimed to have been exploited or understood in the Bronze Age. Much medical research of the 20th and early 21st centuries has focused on cancer, and saffron is one of numerous plant products which has been rigourously tested for possible actions against this disease. The conclusion is that saffron and its components can affect carcinogenesis and it is perhaps the most promising cancer chemopreventive agent (Abdullaev 2002; Abdullaev and Frenkel 1999). Another area of potential for the spice is in the realm of central nervous system degenerative disorders and memory impairment (Abe and Saito 2000). Recent tests have also investigated its anti-depression properties (Akhondzadeh *et al.* 2005), anti-convulsant properties (Hosseinzadeh and Talebzadeh 2005), and even its possible antioxidant and anti-ageing potential (Assimopoulou *et al.* 2005).

The literary and anecdotal evidence discussing saffron's medical value is therefore

backed up by recent scientific research highlighting the pharmacological activities of the spice. Ethnobotanical work indicates that indigenous peoples are extremely aware of the medicinal potential of the plants which surround them. It seems likely that in the Bronze Age Aegean, saffron must have been valued, at least partly, for its healing powers. While problems exist with Rehak's theory about women controlling saffron, he is correct in noting its vitamin content, and its link to gynaecological matters is also now beyond doubt (although this must not lead to forgetting the medicinal value it holds for other complaints, not just those associated only with women). The labour necessary to obtain even a small amount of the substance would perhaps lead to it not being used frequently but reserved for special cases or special people. The hypothesis that Xeste 3 was a kind of "clinic", where phytotherapy combined with divine blessings to allow healing to take place is potentially very interesting (Ferrence and Benderski 2004: 221). This explains the juxtaposition of a powerful plant with a deity on the walls of a building which undoubtedly has some function beyond the residential. The role of spirits and divinities in both causing and curing diseases in pre-industrial societies should not be overlooked, and religion and healing may have been closely connected. Yet it seems unlikely that its healing powers alone can explain the appearance of crocuses in so many diverse contexts, and so other potential uses must be considered.

Dye

Saffron is probably most famed nowadays as the spice which turns rice yellow, although for thousands of years, it has lent a yellow hue to many other materials too. Crocin, the compound responsible for saffron's colouring capabilities, can dye up to 150,000 times its own weight (Humphries 1996: 15). In the Middle Ages ladies used it to tint their hair, fingernails, lips and skin, as indeed did Cleopatra centuries before (Humphries 1996: 17). Turning to the Bronze Age, Cameron suggested that it was perhaps saffron rather than henna which was used to paint the yellow eyelids of some of the women shown in the Theran frescoes (Cameron 1978: 582). The goddess from Xeste 3 even has a crocus 'tattooed' on her cheek (Marinatos 1987: 131); is this also a sign of its use in skin colouring? It may be worth bearing in mind also that in the Near East, saffron, turmeric and sumac all appear in cuneiform tablets in the context of stains for hands (Campbell-Thompson 1924: 109).

Saffron was also used to provide a vivid yellow pigment in Byzantine manuscripts instead of gold, and featured in numerous alchemical recipes, again for its colouring properties (Papathanasiou 1999). There is no way of knowing whether

the Minoans wrote or painted on perishable materials, so no traces of such use of saffron remain from the Bronze Age. Pigments used in wall-painting can be analysed though, and while results thus far indicate that they almost all derive from mineral sources, it is possible that, like in Egypt, some may have been come from vegetal sources (Dandrau 1999: 29; 33).[47] In fact, Dandrau suggests saffron as a possibility for such a paint (1999: 36), although it is uncertain how stable saffron-yellow is on plaster, and so if traces of it could ever be identified (Brysbaert pers. comm. 2006). A passage in Plutarch refers to a stele in a temple to Artemis on Euboea which gave off the odour of saffron when rubbed (*Themist.* 8. 2). This is thought to be a reference to the practice of painting the words of an inscription with saffron as opposed to real gilding (Svenbro 1993: 89). Again, the question of whether Minoans used saffron in place of gilding on decorative stone is unlikely to be answered in the near future.

The idea of colouring food and drink should not be dismissed without thought either. The colour of dishes served at banquets became important in late medieval western Europe, with yellows especially favoured (Strong 2003: 85). The aim was to imitate gold, a substance with elite links, as well as connections with paradise as expressed in Gothic art (Strong 2003: 85). Saffron was one of the ingredients employed to provide this colour. On the basis of the crocus-decorated cups and jars from Aegean, it may be possible to suggest a saffron-enhanced beverage was important at communal gatherings. It could also have been employed at large banquets to colour the food of certain individuals, establishing or maintaining status. The golden colour perhaps provided associations with actual gold, and may have held other resonances within a Minoan world-view. Archaeologies of colour are a recent development, but it is clear that the use of colour is a powerful means of objectifying social and symbolic values (Jones and MacGregor 2002: 12). This avenue has yet to be explored for Minoan Crete.

Saffron can be used as a fabric dye too. It was the yellow of choice of diverse groups, from Persian carpet weavers to Tudor royalty (Humphries 1996: 16). It is what is known as a 'direct dye', meaning it requires a mordant such as alum to fix the colour (Barber 1994: 113-114).[48] The magnificent dresses in which many of the ladies in Minoan frescoes are attired are ample testimony to the skilful textile work which was already practised in the Bronze Age. Items such as loom weights, spindle whorls and murex shells, when recovered from archaeological contexts, provide the concrete evidence of this practice. Indeed Akrotiri furnished large

[47] The identification of indigo in the Thebes frescoes was the first instance of proof of a vegetal pigment being used in the Bronze Age (Brysbaert and Vandenabeele 2004: 691).
[48] Humphries provides detailed instructions for dying cloth with saffron (1996: 17-18).

amounts of just such artefacts (Tzachili 1990; Douskos 1980: 144), and so obviously textiles of some form were manufactured on the island. Was saffron used to dye some of these? It must not be forgotten either that the purple petals can also be used for colouring purposes, although this dye seems less satisfactory than other available blues and purples, and so probably was not the most important property of the flower.

The first step in identifying saffron-dyed cloth should be to search for any evidence of yellow dye being used in the Bronze Age. While actual cloth does not survive, depictions of it do, and the frescoes indicate that yellow was indeed a colour used for clothes. The Priestess in the West House is wearing a long yellow robe (fig. 60), and the older woman in Xeste 3, 3b wears a yellow diaphanous top, and carries a yellow fleece-like item. Diaphanous yellow material is also evident on the young girl to the right of the Adorants scene (fig. 167) and further afield, on the small figure in the Cult fresco from Mycenae. The women painted in the miniature Tripartite Shrine scene from Knossos have yellow dresses, as do those in the Sacred Grove and Dance, and several other examples can be found in Bronze Age wall painting. Barber notes that in Classical times, yellow was a colour considered suitable for women only (Barber 1994: 116). The epithet 'saffron-robed' is frequently used in myth and epic, referring to nymphs and goddesses, while Aristophanes used the term when implying that men were effeminate, and those who were masquerading as women wore saffron robes (Barber 1992: 116). The robes of young girls who served Artemis at Brauron were saffron-dyed, *krokotoi* (*Lys.* 644-45), and it has also been postulated that the woman's wedding veil of classical Greece was *krokos*-dyed, in this instance the term standing for a range of colours on the yellow-red-purple spectrum (Llewellyn-Jones 2003: 224-225).

While comparing classical Greece with Bronze Age Greece should always be done with great care, it is interesting to note that all the examples of yellow cloth in frescoes are worn by women. In fact, a close link between women, cloth manufacturing, and ritual may have existed in the Bronze Age. While the weaving and offering of a great saffron robe to Athena was central to the Panathenaic Festival and is the most renowned role of a textile in religion, other cloth rituals are known from many societies (Goodison & Morris 1998: 125). One of the frescoes from Akrotiri, in the House of the Ladies, has been interpreted as just such a cloth ritual, a robing scene of a priestess (Marinatos 1984b: 97-105). Could it be, as Barber postulates, that the Bronze Age was a time when "women's cloth rituals should have been at their peak, when both cloth and its female producers had far more economic importance than they did in Classical times" (Barber 1992:

117)? Certainly manufacturing cloth, especially that which was dyed an attractive bright yellow, could bring wealth to an island community such as Thera, in the same way the production of the spice has brought wealth to modern Krokos. Tzachili has suggested that some form of cloth-making guild may have operated at Akrotiri, with an aim of surplus production (Tzachili 2005: 116). She envisages a collective entity, such as a sanctuary or administrative centre, gathering and utilising saffron for its pigment, or else a communal collection of the product which was then redistributed to the community (Tzachili 2005: 115). Either of these options could have ensured the town's reputation as a cloth- or dye-producing centre. On the other hand, it is unlikely that all yellow cloth was saffron-dyed, and perhaps safflower or other natural yellow dyes were used for the majority of products, while saffron-dyed cloth became a luxury or elite product around the Mediterranean, much like the purple of Roman emperors. It may even be that saffron-dyed cloth was important as ritual clothing, as those wearing it in the frescoes have all been interpreted as involved in some form of ritual practice.

Saffron as a "peculiar substance"

The term "peculiar substance" is one which has been applied to non-staple food elements which nonetheless have social and cultural significance, usually based on their non-nutritious properties (Goodman *et al.* 1995: 6-7). This is perhaps a good description of saffron, which may be particularly peculiar, because interspersed among the multitude of references to its medicinal qualities and other uses, there are a number of noticeably strange comments. Gerard's Herbal notes that saffron can "maketh a man merry", and Tournefort warned that too much could lead to death by laughing: "I saw a lady of Trent almost shaken to pieces with laughter immoderately for a space of three hours which was occasioned by her taking too much saffron" (Stacey 1973: 5). Culpeper also noted this effect, remarking that "some have fallen into immoderate convulsive laughter, which ended in death" (Humphries 1996: 10), a warning which echoes that found in medical Sumerian texts millennia before (Willard 2001: 15). Francis Bacon wrote "the English are rendered sprightly by a liberal use of saffron in sweetmeats and broths" (Humphries 1996: 152). In the course of research on this topic, the author has heard of kitchens having to lock up saffron to prevent it being smoked by chefs apparently looking for an easy high, and of several examples of people experiencing 'out-of-body' experiences after ingesting saffron. In Krokos, there is a general perception that saffron tea makes you feel happier and makes you laugh. Is it possible that there is something else about the spice which could lend it

psychotropic powers, and so be used to enter or enhance an altered state?[49]

Certainly, saffron is a pharmacologically active product. Writers have always accompanied their suggested medical uses with a caveat warning against taking too much of the spice, which can be fatal. How much is too much? This varies from writer to writer, and also would depend on the relative purity of the sample, but seems to lie within the exceedingly broad range of 1.5 to 20 grams, differing according to the source (Basker 1999: 49; Ferrence and Bendersky 2004: 210). Symptoms of saffron overdose include nosebleeds, vertigo, vomiting and a slowing heart rate, and possible death (Humphries 1996: 149). Is it possible that somewhere in the middle ground between a saffron overdose and a minimal beneficial amount, the spice can have psychotropic effects? Chemically, saffron is composed of three main compounds: the carotenoid colouring pigments (crocins); picrocrocin which gives the bitter taste; and safranal, the volatile oil responsible for the aroma, while other proteins, sugars, and minerals exist too (Abdullaev 2002: 21). None of these is a known psychotropic, although there has been less research done on this aspect of the spice than its anti-cancer properties, for example. It may be best to conclude that although saffron does not contain any pharmacologically recognised psychotropic alkaloids, its pungent aroma when burned could have been used to enhance ritual events, and possibly further stimulate the senses of anyone in an altered or ecstatic state.

One particular fresco may be relevant here, the 'Priestess' from the West House, Akrotiri. She is holding a brazier or incense burner of some sort, into which she is sprinkling yellowish threads (fig. 168). This is generally agreed to be saffron (e.g. Morgan 1988: 29). Sp. Marinatos did not believe that the object was a brazier, reasoning that as a metal vessel was intended to be portrayed here, it would be too hot for the girl to hold if it contained glowing coals (Thera V: 43). He preferred to see the red substance inside the vessel as "a kind of cake" or "fig pudding", which was sprinkled with saffron (Thera V: 43), but this interpretation is not favoured. The question of why the girl might be sprinkling saffron onto a brazier has not been engaged with by scholars, but it is suggested here that the distinctive aroma of the spice as it burns could contribute to creating a suitable environment for ritual practices. Such a practice is mirrored by the use of incense in churches, but is known from a wide range of cultures. Braziers or incense burners have been recovered from numerous Aegean sites (Georgiou 1979) (fig. 169), and could certainly be used to burn psychoactive substances, or equally, pleasant smelling

[49] The term 'psychotropic' is used to cover all forms of pharmacological activity which calm or stimulate. Such substances can be contrasted to hallucinogens which operate on the central nervous system, and cause changes in perception.

herbs with no mind-altering effect. If saffron does have some kind of psychotropic effect, it may be that burning/smoking is a suitable method of delivery. Once more though, as with medicine or dye, it must be understood that only small amounts of saffron could be used in this manner, to avoid using up a year's crop quickly.

4.5 Final Comments

While a complete crocus catalogue proved beyond the possibilities of this thesis, the plant's appearances in the Bronze Age have nevertheless been considered in depth. The first notable point about this motif is that while it is plentiful in frescoes and ceramics, it does not occur often in metal, ivory, stone, and jewellery, with the exception of examples on gold rings and the Zakros rhyton. This is in contrast to other plants like lilies, papyrus, and even trees, which all appear across a greater range of media than the crocus. While differential preservation must always be considered, it does seem that this is a real pattern, and must be investigated. A close connection between the crocus and Minoan ritual has been suggested by a variety of commentators, but they have tended to base this on limited evidence, usually frescoes and sometimes ceramics. The absence of the flower on other materials is equally important, and serves to underline this flower's difference from other floral motifs.

The association of the crocus with females, perhaps goddesses or priestesses, is paralleled in rings and frescoes. Indeed, it never appears with a male figure in frescoes. Its association with a specific range of animals, especially monkeys, agrimia and birds is also maintained across ceramics and frescoes. Many of the vessels it is painted on are deemed 'cultic', even if not always found in shrine areas: offering tables, rhyta (including the stone Zakros rhyton), and kymbai. The other vessels are those which are associated with liquids, cups and jars, and so could be used in a group ceremony. The faience crocuses come from a sacred context, and those on faience robes reinforce the link posited between women, saffron and cloth. In contrast, the lily features also widely in Minoan art, but it is spread across all categories of material more evenly, and lacks the definite link to cultic vessels. Therefore, that the crocus played a role in Minoan ritual or beliefs seems certain.

Reasons for the importance of the crocus were suggested in the previous section, where the diverse uses to which saffron can be put were discussed. Was it the spice's undoubted healing powers which led Bronze Age worshippers to venerate it, and perhaps link it with a deity? Residues of saffron have apparently been

identified in vessels from Chrysokamino as early as EM III/MM Ia, where it is suggested to have been a component of different herbal remedies.[50] Or was it the vivid colour which can dye cloth, food and drink, and even skin, which led to the parent plant being seen as special? The pungent aroma when burned may have led to saffron playing an important sensory enhancing role in rituals too, out of which a close link developed between crocuses and ritual equipment. Marinatos suggests an alternative for the crocus's apparent key role in Minoan ritual. She sees the plant as indicative of seasonal renewal, especially in the spring (Marinatos 1984: 65), although if it is saffron crocuses which are intended in art, their autumn-flowering invalidates this suggestion. A similar function was attributed the crocuses on the Poros ring, again thought indicative of the awakening of nature in either spring or autumn (Dimopoulou and Rethemiotakis 2000: 48). While rites celebrating seasonal changes are common cross-culturally, the crocus appears across such a range of media and such a wide time span that it seems that the plant must stand for more than this. In fact, it seems most likely that it was polysemic, valued for its magical healing and colouring powers, control of which could bring prosperity, as well as an indicator of the end of another hot Mediterranean summer.

It is worth considering too whether the vessels painted with crocuses had some specific connection with the plant or saffron. Did the askoi and stirrup jars from Akrotiri hold saffron-coloured or scented oils, labelled on the exterior with the plant? Were flowers laid on the offering tables which depict them (although what then was placed on the Akrotiri table painted with dolphins!)? Perhaps the intriguing strainers had some role to play in saffron preparation. The most obvious seems to be in drying the spice, whereby the vessel would have raw stigmas laid inside, and then be placed over some kind of gentle heat source for dehydration. And then the rhyta - was some form of saffron decoction poured or even inhaled through them? In all these cases there may have been either an original link to saffron, or an occasional link with it, but as vessels in all these forms also exist without crocus decoration, it cannot be said that a specific connection existed between the contents and the exterior imagery.

A large part of saffron's reputation as a mystical substance with a whiff of the exotic is due to both its high price (a result of the labour-intensive process described in section 4.3) and the fact that it has always been grown only in a limited number of places. This has led to continual problems of adulteration, smuggling and fake saffron being passed off as real, all practices punished in the

[50] This is based on analysis presented by R. Beeston at the *Flavours of their Times* exhibition, Birmingham in 2002.

past by death or horrible torture (Meyer 1982: 14). Such stories reveal that the substance bears a kind of prestige of its own.[51] That this existed in the Bronze Age also is plausible, and knowledge of how to grow the crocus and harvest the spice may have been as valuable as the product itself. It fulfils all the criteria of a desirable exotic item, as enumerated by Helms: rarity, strangeness, portability, magical potency, valuable as raw material for craft (Helms 1988: 118). It is quite possible that saffron was traded around the Mediterranean during the Bronze Age, bringing both wealth and, equally importantly, kudos to its masters. Interestingly, Crete had a reputation in Roman times as provider of many medicinal herbs (Galen XIV: 211) and emperors maintained a staff of botanists on the island (Nutton 1985). This may be extended back in time to the Bronze Age, when the Keftiu (most probably Minoans) were associated with healing by the Egyptians (for Egyptian references, see Sakellarakis and Sakellaraki 1983: 198). Could it be that the Mycenaeans were trying to get a foothold in such a trade, hence the apparent increase in saffron production in LM III?

A final thought returns to the 'imagery package' of which the crocus forms a key part. Marinatos suggested that the kymbai, with their flowers, agrimia and marine motifs, form a unified decorative programme denoting the two major environments crucial for the livelihood of the Therans, land and sea (Marinatos 1990a: 371). It may be more fruitful to consider the crocus, and agrimia or monkeys, and perhaps dolphins as a symbolic complex, interdependent on each other but meaningful separately too. Ethnobotany demonstrates that such symbolic packages often relate to early myths in society, for example, to do with the creation of the world. Among the Huichol, for example, the peyote-deer-maize trilogy embodies the sacred and life-giving elements which existed before mankind and so represent unity of past and present (Furst 1972: 141-142). They appear in art and are a shorthand for what it means to be Huichol. It may well be possible that the crocus, important for all the reasons discussed above, over time became assimilated with Minoan identity and ritual, and imbued all aspects of a life where the sacred and secular overlapped.

[51] For an exploration of the roles and meanings of spices in classical Greece, see Detienne 1994.

Chapter 5: Gardens in the Bronze Age Aegean.

In Xanadu did Kubla Khan
A stately pleasure dome decree:
Where Alph, the sacred river, ran
Through caverns measureless to man
Down to a sunless sea.
So twice five miles of fertile ground
With walls and towers were girdled round:
And there were gardens bright with sinuous rills,
Where blossomed many an incense-bearing tree;
And here were forests ancient as the hills,
Enfolding sunny spots of greenery.

Kubla Khan; Samuel Taylor Coleridge

5.1 The Idea of the Garden

One of the main issues that almost instantly waylays the garden researcher is the troubling question of what exactly is a 'garden'? Ideas of what actually makes a garden are undoubtedly influenced by cultural context. A quick glance around the world throws up numerous different types of gardens. There are the Zen gardens of Japan, the forest gardens of Papua New Guinea, or a chocolate-box English country garden replete with roses. Turning to the past, on the one hand are the magnificent formal gardens of the French chateaux, such as Versailles, and the Moorish gardens found most famously at the Alhambra in Spain. On the other hand, consider the quiet 'physick' gardens associated with medieval monastic orders. Before trying to identify a Minoan garden in particular therefore, it is helpful to establish a few ground-rules for identifying a garden in general.

Firstly, it is important to be aware that gardens do not have to have flowers to be considered gardens, and secondly that flowers are not necessarily merely decorative, and hence, as often implied, useless. Berrall, for example, follows this division and contrasts utilitarian gardens with pleasure gardens, the latter to "nourish man's soul" (Berrall 1978: 7). This separation of utility and ornament should be approached with care - only if the society being studied is known to have made distinctions along such lines are they valid categories. Jorg Schäfer was the first person to write a piece of work focusing on Minoan gardens, yet he confined his study to pondering "the decorative kind of gardens ... flower gardens." (Schäfer 1989: 85). Shaw widened the focus to look at "the floral landscape" (Shaw 1993: 661). At first glance, these both seem like a safe option for Minoan studies; the proliferation of flowers on frescoes makes flower gardens

seem an obvious choice to investigate. However, as Gleason puts it, "in many cultures fertility, utility and abundance are synonymous with beauty, and the structure of a field or vegetable garden holds potential for readings other than the purely functional" (Gleason 1994: 2, n.2). By approaching the search for Minoan gardens with an idea of ornamental flower gardens in mind, the risk is that not only will other types of garden be overlooked, but the significance of flower gardens may be misunderstood also.

For Gleason, the two essentials of any garden or field are that they are bounded and cultivated (Gleason 1994: 2). She points out that the difference between 'garden' and 'field' is often nothing more than a semantic one - one culture's gardens can easily be another's fields. Furthermore, there are other bounded, cultivated entities, such as orchards, woodlands and parks to be considered. Where do these fit in to the overall scheme and how do they differ from a garden? Each of these fulfils the role of a garden in different cultures. Parks are large, enclosed areas, often with woodland, used for recreation. Xenophon tells of the magnificent royal gardens of Cyrus of Persia at Sardis, which were called *pairidaeza* (*Oec.* IV: 13-24). These great hunting parks of the Persian kings live on in English, via the Greek *paradeisos*, as 'paradise' (Thacker 1979: 16). Essentially, parks were gardens on a royal scale, although in modern times they have the added implication of usually being public areas. In contrast to a park, ethnographic work provides some interesting examples of the pride taken in well-ordered, productive and, from a modern Western point of view, utilitarian fields or gardens. Malinowski comments on the care for the aesthetics of gardening taken by the Trobriand men, for whom a good-looking garden and produce are crucial to their very role as men in that society - a man with no gardens would be an outcast (Malinowski 1935: 56; 60). Likewise Steensberg (1980), describes how a tidy garden and a good crop of yams is a source of pride as well as food in New Guinea. A garden therefore can be seen as an area of land, size immaterial, with some form of boundary to mark it off from non-garden. It is the domain of the cultivated rather than the wild. Even when intentionally created to resemble wilderness, it remains an area under human control. Crucially, a garden must undergo some form of human intervention to create and maintain it.

5.2 Digging for Dirt: How to Find a Garden Archaeologically.

The fact that gardens are alive and constantly undergoing work, changing seasonally or annually, or according to the whim of their owners, means that they are totally unlike other classes of 'artefact' that archaeologists expect to find. Indeed, where gardens are concerned, earth "is both the relic and the context"

(Gleason 1994: 3). Thus to excavate a garden is to pull apart the very goal of the research, and extra care must be taken to wring every possible grain of information out of the soil. The methods for recovering gardens through archaeology are explained below.

Non-palaeobotanical methods

There are examples of gardens of the past being successfully recreated thanks to careful use of modern archaeological techniques, most famously in the work of Wilhelmina Jashemski in Pompeii (e.g. Jashemski 1974; 1979; 2002). She pioneered the method of taking root-casts from the lapilli-filled cavities remaining behind in the hardened ash, and so was able to identify some species of tree or plant, as well as demonstrate the original layout of the gardens. Pompeii, Herculaneum, and the various villas destroyed by Vesuvius in the 1st century AD are special cases though, with the imprint of the living landscape of the past preserved beneath the ashen cloak. It must be asked however if such methods could be applied at Akrotiri? Perhaps a Bronze Age garden lying buried beneath the volcanic matter could be recreated? Attempts have been made to reconstruct the general vegetation of Thera, but when it comes to the Minoan Palaeosol (c.3300-3500 BP) little remains below the pumice, except for a few mineralised roots from quarries, which have been tentatively identified as woody herbs (Friedrich 1980: 124-125), but it is a long way from such remains to gardens.

In most cases, archaeologists are confronted with a more difficult situation from which to try to learn about the gardens of the past. As a bounded entity, there may be remnants of the border of the garden, whether this was a wall or ditch, a man-made fence of stakes or a barrier formed of plants. Methods like aerial photography or geophysical surveys can often bring some of these features to light, and complemented by careful excavation, evidence for such boundaries is retrievable.[51] A feature of many larger gardens is the presence of small man-made structures within them, pavilions or grottoes, for example. There may be remains of these too, again obtainable by the methods outlined for discovering boundaries. Similarly, the location of water features such as ponds, channels or irrigation ditches may be discovered using such non-invasive methods.

Evidence for the internal features of a garden may not be so easily obtainable. Careful excavation can reveal the differences in soils, leading to the identification of paths, terraces, flower beds and so on. However, individual features of a garden vary in size from a tiny plant to a large walkway, so small test pits will

[51] For problems encountered in applying such methods to garden remains see Currie 2005: chaps. 4, 5, and 7.

never reveal the bigger picture of the garden as a unit (Yentsch and Kratzer 1994: 168). Total excavation should be avoided however, especially on multi-period gardens, as this practice precludes any future studies of the area (Currie 2005: 58-62). Stripping the soil with heavy machinery can reveal the garden layout as patterns in the earth, but this approach obviously may not be practicable in all situations. One archaeologist concludes that linear trenching provides the best results for garden archaeology (Currie 2005: 72).

Palaeobotanical methods

Given the right types of conditions, various botanical remains survive and can be examined by specialists to shed light on the kinds of plants grown in the garden. The most common types of macrofossils are seeds and grains, which usually have been preserved through carbonisation, oxidisation or petrification (Dincauze 2000: 332-333). Seeds also may be recovered from frozen sites and bogs or waterlogged areas, as well as particularly dry locations. A visibility problem affects seeds however; those plants which produce only a few big heavy seeds rather than producing large amounts of small ones may not appear palaeobotanically. This is because big seeds, which land near the plant, have a low survival rate as they are often eaten. Thus the balance of plants recovered from the garden is already tilted in favour of certain species with smaller, widely dispersed seeds. The overall picture can be further distorted by weed seeds and other species which are brought in to the garden in the manuring process (Currie 2005: 81-82). Charcoal is extremely useful in identifying wood types, but again is better preserved in extremes of climate or waterlogging. However, considering the frequency with which burning takes place in gardens, there is always the hope of finding burnt material surviving in a favourable environment. In a more indirect manner, certain faunal remains can indicate what kinds of plant were grown, as the insects or animals may have a direct relationship with a particular plant (Evans and O'Connor 1999: 141). Other cases of macrofossil evidence, such as coprolites or impressions on clay, are less useful in garden archaeology, as there is no guarantee that the provenance of the vegetation is the garden in question.

The study of microfossils can also add to knowledge about ancient gardens. Palynological analysis is the most well-known of these methods, and although normally used to provide information on a regional level, as demonstrated in chapter one, theoretically it is possible for pollen to provide evidence of garden plants too. The main problem with using pollen for such work is that it is very difficult to ascertain that the sample being studied is from a specific locale, as opposed to transported from further away by animals, humans, wind or water

(Evans and O'Connor 1999: 70). Residual pollen from the past also makes establishing which plants were contemporary with each other not necessarily straightforward (Evans and O'Connor 1999: 71). Moreover, in relation to gardens another problem arises, namely that there is a huge preponderance of wind-pollinated plants in any palynological sample, (i.e. mostly trees), but that gardens contain insect-pollinated species too. Insect-pollinated plants do not produce as much pollen as those relying on the wind, and are always going to be almost invisible archaeobotanically. One further problem arising from palynological studies is that pollen is usually identified to genus level, and so does not always provide the degree of specificity that would allow correct interpretation of the exact flora in the garden. Yet for all its problems, pollen analysis does offer another line of investigation into gardens of the past, and sometimes the results can be encouraging (Currie 2005: 82-84).

A further area of microfossil study that can help in identifying garden flora of the past is phytolith analysis. This concentrated silica forms in plant cells, especially in grasses, and can be recovered from a variety of sediments. Again, as with pollen, identification is not always easy but some species have very characteristic phytoliths.[52] Soil analysis has also been shown to help in identifying differential use within a garden. For example, magnesium, calcium and phosphate all help indicate whether the area in question was a melon garden, parkland, or the archery lawn (Currie 2005: 76-79).

Relative information

It must be stressed that searching for or recreating gardens while informed by knowledge of the gardener's own aims and methods is highly desirable (Yentsch and Kratzer 1994: 170). Familiarity with these informal rules that govern gardening, "a social logic for space," enables the archaeologist to make better informed decisions about where to dig and what to expect (Yentsch and Kratzer 1994: 172). For example, using the principles of symmetry so beloved of the garden designers of certain eras, predictions can be made about the locations of features such as flower beds. A relatively accurate plan of a formal garden can therefore be made based on investigating half or less of it, and then using relevant knowledge to fill in the gaps. Of course, dealing with later gardens means that there is a large body of literature from that period to help the archaeologist understand the attitudes and ideas of the time. This method of a culturally-informed model of the garden is applicable to many cultures, where texts can be read, or artistic representations of gardens can be seen (Yentsch and Kratzer 1994: 172). It is important to remember however, that not all documentary evidence

[52] For further information on phytolith studies, see Rapp and Mulholland (eds.) 1992.

shows what actually existed in the garden, but may reflect future plans, owner's aspirations, and a certain amount of showing-off (Currie 2005: 27-32).

Ideally a mixture of all of the above methods, (structural remains, palaeobotanical and cultural knowledge) would be available to the archaeologist reconstructing a garden. The problems with pollen could then be ameliorated by supporting evidence from other types of remains, which confirm the onsite presence of certain plants. Coupled with a knowledge of the cultural norms relating to gardens, and any artistic representations, it should be possible to suggest probable sites for gardens, to estimate relatively accurately their layout, and then to identify plants contained within the confines of the garden. As for solving questions about the beliefs associated with gardens, or what went on inside them, archaeology may not provide all the answers, although a phenomenological approach may elucidate interesting information. A closer look at some of the different garden practices throughout the world will, however, offer glimpses into the varying types and roles of gardens.

5.3 Comparative Gardens

That gardens have varied between societies not just in their contents and design but also in their functions and meanings is a key point to grasp. This section considers the history and meanings of gardens in a range of societies: Egypt, the Near East, and Western Europe. The time span covered ranges from prior to and contemporary with the Minoan civilisation to nineteenth century Europe. Such a broad range is chosen for two reasons: firstly, because Minoan society did not exist in a vacuum, but was surrounded by cultures who had gardens replete with meaning, a fact which must have some bearing on any search for Aegean gardens. Secondly, later gardens, and the accompanying literary resources, are used to fully explore the multiplicity of ways in which plants can be manipulated to broadcast messages to society.

Egypt

Most evidence for the gardens of ancient Egypt comes from tomb paintings (fig. 13) and from texts. These sepulchral images represented gardens belonging to royalty and elites, often idealised, and those which were connected to temples. All the information indicates that Egyptian gardens were symmetrical in form, carefully planned, and often had a tomb or temple as a focal point. Irrigation was essential in this dry land, where the annual flooding of the Nile was the only dependable source of water. Canals were constructed to take water from the Nile to the gardens, where lakes and pools helped store it (Berrall 1978: 12). Some of

the species of plants grown in these gardens can be ascertained today by examining their painted representations. Wilkinson comments that accurate reproductions were essential because the plants shown were required to live forever on the walls of the tombs, thereby ensuring the activities depicted would continue into eternity (Wilkinson 1998: 4; 15). Accuracy of depiction was surely also important because many plants had symbolic significance, so needed to be correctly shown to be efficacious. Numerous plants that are known to have existed in pharaonic times from their archaeological remains are not illustrated, thus underlining the importance of those that are actually shown (Wilkinson 1998: 15).

The design of Egyptian gardens was undoubtedly influenced by religious beliefs; these sacred landscapes gave "concrete reality to mythological places which were described in religious texts."(Wilkinson 1998: 2). For example, tombs could be landscaped as a mound with trees around it, in imitation of the tomb of Osiris (Wilkinson 1998: 13). The layout of the sacred garden at the tomb of Mentuhotep at Deir el-Bahari can be reconstructed: an avenue of sycamore figs led between rows of tamarisks to the temple; between the sycamores were rectangular flower beds, although unfortunately the remains of roots found in them could not be used to identify the plants once growing there (Wilkinson 1998: 69). Both these trees were sacred, the sycamore fig to Hathor, provider of nourishment to the deceased, and the tamarisks to Nut, who gave birth to the king among a grove of these trees (Wilson 1990; Wilkinson 1998: 72). Those who were not royalty but nonetheless belonged to the higher echelons of society often imitated these Osiris mounds and sacred groves on a smaller scale. Within the tombs, detailed paintings show the gardens of the wealthy, reproduced to provide pleasure and magical produce for eternity, and so ensuring the continued prosperity of the deceased. Central pools, containing a combination of water lilies, papyrus, water fowl and fish were a common feature of these gardens, while vines, an orchard, and sycamore figs, as well as date or doum palms may also be present (fig. 13). Flowers usually included mandrakes, poppies and cornflowers.

The other main location of gardens in ancient Egypt was at temples where they were symbolic of the annual cycle of growth and decay, of flooding and harvesting, of the very power of creation (Wilkinson 1998: 120). More practically, these gardens were for providing offerings for the gods, who were believed to dwell within the buildings. For example, lettuces were sacred to Amun-Min, and were grown specifically to offer to him (Wilkinson 1998: 135). This practice supports Goody's claim that flowers may originally have been domesticated to

provide offerings for the gods (Goody 1993: 28-29). Religious ceremonies occurred in these temple gardens too, especially on the lakes. The number and variety of gardens created by Akhenaten at his new capital, Akhetaten, or Amarna, underlined the power of the king and his favoured god, Aten, or the sun. Not only were real gardens laid out across the new city, but gardens were painted or tiled on walls, allowing flowers to be in bloom throughout the year (Wilkinson 1998: 146). The Maru-Aten, a walled area forming a sacred precinct to Aten, contained a lake, pools, trees and flowers. Floral decoration extended beyond the flowerbeds though, and in a shrine on an island at the eastern end of the lake could be found paintings of palms, acacia, papyrus, reeds, vines and other flowers (Wilkinson 1998: 150-151). In fact, there is such an abundance of information about Egyptian gardens that only a very brief summary can be given here. Information from excavation and paintings shows the important role played by gardens in the lives of the gods, including the pharaoh, and of mortals too. Is it possible that the Minoans, who undoubtedly had contacts with Egypt, could have been influenced by any of the beliefs and practices associated with the gardens of their southern neighbours?

The Near East

The great civilisations of the ancient Near East also had a long tradition of gardens. These were associated with royalty once more, and the king's personal interest in gardens is documented since the reign of Tiglath Pileser I (1114-1076 BC). According to the Assyrian royal inscriptions, he brought back foreign trees and plants from his military campaigns, and established gardens outside the capital:

> "I took cedar, box tree, Kanish oak from the lands over which I had gained dominion - such trees which none among previous kings, my forefathers, had ever planted - and I planted (them) in the orchards of my land. I took rare orchard fruit which is not found in my land (and therewith) filled the orchards of Assyria" (Kuhrt 1995: 310).

King Ashurnasirpal II (883-859 BC) planted a royal garden at Nimrud, his new capital, complete with canals and waterfalls again demonstrating the fruits of imperial conquest (Stronach 1996: 175). Sennacherib (704-681 BC) also had a mixture of local and imported plants situated near his new "Palace without Rival" at Nineveh, where he even built an aqueduct to supply the irrigation canals that would maintain his gardens (Albenda 1976: 6) (fig. 170). Plants found there included palms, myrrh, cypresses, vines and various spices (Berrall 1978: 28). The reliefs from his reign are now lost but drawings of them do survive, and even include scenes of flowers in vases being carried by attendants (Albenda 1974: 5).

Surviving reliefs come from Room S of the 7th century North Palace of Ashurbanipal in Nineveh, which was decorated with scenes of the king and queen in a garden, surrounded by trees and shrubs, many of which are identifiable (including grapevines, conifers, date palms, pomegranates, and a water lily) (Albenda 1974: figs. 1-8) (fig. 14). One detail which may escape a hasty glance is that hanging from the branches of one of the trees is the severed head of an Elamite king. There can be no clearer demonstration that the garden was a place for impressing visitors, both peers and lesser members of society.

Oppenheim believes that all these gardens of Assyrian kings are imitating wooded and hilly terrain, rather than being geometrically laid out like Egyptian ones (Oppenheim 1965: 332). Certainly this is deliberate in the case of the Hanging Gardens of Babylon, built by king Nebuchadnezzar for one of his concubines, who was pining for the meadows of the mountains of her homeland (Thacker 1979: 16). A recent work however suggests that it was in fact Sennacherib who was the owner of the famous Hanging Gardens, therefore placing them at Nineveh rather than Babylon (Dalley 1994). Another suggestion is that these new gardens built in the cities were perhaps smaller imitations of the large parks in the countryside which were stocked with game for royal hunting parties (Oppenheim 1965: 333). One thing is certain though; that Assyrian monarchs were proud to display foreign flora, often undertaking major hydraulic engineering to ensure the new plants could thrive, and then surrounding them with exotic foreign animals to further enhance the wondrous nature of their gardens and parks.

Magnificent formal gardens continued to be a part of royal eastern life for the next thousand years, and spread with Islam into North Africa and Spain. Features such as pools, channels, and carefully laid out rows of trees for shade in these hot, dry countries united the Islamic world, even if there were internal schisms over religious beliefs. Such gardens have long fascinated the western outsider, with the promise of mysterious Oriental delights behind high walls, their exotic plants and scented air. Although these Mesopotamian and Persian gardens date from post-Minoan times, it is evident that a long tradition of linking conquest and expansion with importing new species of plants, and indeed animals, existed in the Near East. This is a motif which will be returned to below, as it may be relevant for the eastern Mediterranean in the Bronze Age.

Western Europe

In the Western Christian tradition, the very first garden is the Garden of Eden, described in the book of Genesis. Eden is characterised by trees: "Out of the

ground the Lord God made to grow every tree that is pleasant to the sight and good for food, the tree of life also in the midst of the garden, and the tree of the knowledge of good and evil."(*Genesis* 2: 9). There are no references to flowers in Eden, indeed very few in the Bible at all, which Goody sees as a conscious rejection by the Jews of the garlanded idolatry of their eastern neighbours (Goody 1993: 46-47). It is interesting to note the presence of trees which are simply "pleasant to the sight"; already humans are tending nature for reasons other than subsistence. Eden is also well-watered, with a river flowing out of it and then dividing into four branches, two of which are the Tigris and Euphrates. So the ancestral garden of Western society is equipped with the two key features that occur again and again in gardens throughout history: water and shade.

Turning to another work central to the Western tradition, Homer's *Odyssey*, gardens occur again. The most famous is the garden of Alcinous (*Od.* 7: 112-131). This magical garden where plants are constantly thriving, whose fruit "never fails or flags all the year round," contains an orchard of pomegranates, pears, apples, figs, and olives, a vineyard and beds of herbs and vegetables, all contained by "a fence running round, this way and that." There are also two springs, one "channelled out over the whole space of the garden," while the other flows out of the garden allowing the city people to draw water from it. Aeetes's garden in Colchis is even better watered, with four separate streams: one each of water, oil, wine and milk (*Argon.* 3: 210-229). These are indeed gardens fit for a king, and returning to Homer, a third royal garden is described. On Odysseus's return to Ithaca, the hero finds his father, Laertes, labouring in a well-tended garden, where "not a thing that is growing in this plot, not a vine or fig-tree, not an olive-tree or pear-tree or seed-bed is left uncared for" (*Od.* 24: 226-230). It is obviously not beneath a king to spend time working in his garden, and later Odysseus recalls:

> "when I was a little child following you about the garden and begging for one tree and then another; we walked through them all and you named them one by one. You gave me thirteen pear-trees, ten apple-trees, forty fig-trees, and you promised, yes, to let me have fifty rows of vines,"(*Od.* 24: 336-343).

It appears that the king was personally concerned with his gardens in the Greece of Homer's tales.

Turning from literary remains to actual physical remains of gardens, little is preserved of the gardens of ancient Greece.[53] There must have been some form of horticulture in Athens to provide food for the population, and Carroll notes that

[53] For a detailed survey of literary sources on Greek gardens, see Daremberg and Saglio 1899, under *Hortus*.

any such gardens would have been outside the city walls, as space was at a premium for housing within them (Carroll 2003: 29). That there was a garden attached to Plato's Academy is known, and likewise Theophrastus inherited some form of garden from Aristotle (Thacker 1979: 18). Explorations at the temple of Hephaistos overlooking the Agora revealed cuttings in the bedrock, and flowerpots, indicating that trees, shrubs and plants surrounded the temple (Thompson 1937) (fig. 171). Indeed, a sacred grove was a common feature at Greek temples (Carroll 2003: 67). Roman gardens are better documented, although it is once again those of the elite that both make it into literature and are archaeologically more visible, through the virtue of being attached to palaces, villas and large houses which attract excavation.[54] The usual elements of gardens of the wealthy are evident: places for rest in the shade (colonnades), water-features, and exotic plants. For example, the House of Loreius Tiburtinus in Pompeii has a particularly lavish garden extending practically the length of the insula, including elaborate water channels with fountains, a vine-covered pergola, statuary, and trees along the walls (Jashemski 1979: 45). Public gardens could be found at the baths, the theatre, and even restaurants had their own gardens (Jashemski 1979: 164).

In the early Middle Ages few (flower) gardens were found outside monasteries (Goody 1993: 160). This was probably due to Christianity's desire to set itself apart from other religions, whose use of flowers as offerings was seen as luxurious and wasteful; far better to admire the handiwork of God in the fields as it should be seen (Goody 1993: 89; 96). Evidence for gardens of commoners is non-existent, although presumably small plots would have helped nourish families. The most common garden remaining from this period is a fantastical one found in literature, such as in Chrétien de Troyes's *Erec et Enide*. This is a fertile place, where fruit was ripe all year, filled with birds and spices, and encircled by a magical invisible wall (de Troyes 1991: 107-108). Such a description is reminiscent of Alcinous's garden with its eternal harvests, and the key characteristics of a garden appear unchanged: bounded, well-stocked with wildlife and birds, and as expected for medieval times, containing medicinal herbs. All monasteries had a 'physick garden' where plants were grown for their healing powers, including ones that today would not be considered medicinal, such as lilies and roses (Thacker 1979: 82). The symbolism of such flowers in the Church grew during the Middle Ages, with plants being used to help illustrate the story of Jesus, e.g. palms on Palm Sunday symbolising victory (Goody 1993: 154). Even the Virgin Mary came to be seen as a pure, white lily, giving rise to the name Madonna Lily (Goody 1993: 156).

[54] For a detailed survey of literary sources on Roman gardens, see Daremberg and Saglio 1899, under *Hortus*.

The next development in gardens in Renaissance Europe was the dawning of the era of large formal gardens, typified by the still extant gardens of the Villa d'Este at Tivoli. Careful planning became important, to maximise vistas over the surrounding countryside, to lead the visitor along pathways lined with neatly laid-out beds, to bring them suddenly face-to-face with an unexpected delight: a grotto, a cascade, a classical sculpture. Surprise was key, and trick water jets were used to wet unwary visitors, or mechanical birds were made to sing through ingenious hydraulics (Thacker 1979: 113). New species of plant arrived in Europe, the results of the voyages of exploration to the New World and the East, and were grown as curiosities by the wealthy (Thacker 1979: 127). As with all gardens on such scale, these were the preserve of the elite, created by the knowledge accessible only to the upper echelons of society who were also its intended audience. Only those who moved in such circles would have fully appreciated the nuanced messages of power that the garden was displaying.

Although varying from country to country and over time, the tradition of large formal gardens surrounding the houses of the wealthy continued through the 17th and 18th centuries. Versailles, created for Louis IV, was almost monstrous in its size and detail, "a gesture of arrogance" says Thacker (1979: 152). For Louis and his wealthy contemporaries "the natural world of trees, stones and water, forests, hills, and the sea, was not in itself beautiful or admirable, but lacking in beauty, proportion and harmony until man had brought it under control, and imposed on it his man-centred order, balance and symmetry." (Thacker 1979: 153). Nature had come to be seen as subordinate to the king and to mankind in general. This continued to be the dominant theme of elite gardens over the next two centuries.

5.4 Evidence for Minoan Gardens

Aegean Bronze Age gardens have been little studied yet their reality is taken for granted. Evans, himself a keen amateur botanist, was quite certain that the dwellers of Knossos had green fingers and that "the rich burgher class and the Priest Kings themselves could not have been behindhand in their interior garden cult" (PM III: 277). He envisaged the light wells and courts being brightened up with potted plants, but seems to have stopped short of suggesting actual gardens within the palace. Various other excavators have suggested gardens for certain locations on their sites, while other scholars have focused on iconography for evidence. As well as reconsidering these options, other elements of a possible Minoan garden such as flower pots, flower beds, tools and gardeners, are explored in depth in this chapter. A section is also devoted to water supply in elite architecture, an often overlooked necessity when gardens are under discussion,

yet an essential element which must be considered.

(i) Architectural location

In his analysis of Minoan architecture, Graham suggested locations within a number of building complexes where gardens may have existed, focusing in particular on garden terraces opening off porticoes (Graham 1987). At Knossos, he suggested that the portico to the east of the Hall of Double Axes opens onto an L-shaped veranda which was "probably a garden terrace, bounded on the east and south by a low retaining wall and commanding a view over the valley beyond." (Graham 1987: 87) (fig. 172). Evans restored the surrounding wall here to the full height of the first storey however, believing that the area needed protecting from the onslaught of the southeast wind (PM III: 293), thus reducing the vista from any possible garden across the landscape. As the area in question is a paved area, it is not the ideal foundation for a garden, because drainage problems would surely occur (PM I: fig. 239) (fig. 173). On the plus side though, there is a MM III well in this area (PM III: 255), which could be used to draw water for plants.

Graham mentions two locations for gardens at Phaistos; room 77-79 in the north of the palace opens onto a colonnaded portico, leading to a garden perhaps, and to the east of the central court another veranda (64) opens onto a natural rock terrace, where he envisages a flower garden (Graham 1987: 89; 91) (figs. 174-175). The unroofed area to the northeast of the central court could also have been a garden. At Mallia there is a columned portico off the 'Men's Hall', again leading out to a suitable garden area (Graham 1987: 91) (fig. 176). Furthermore, Graham adds, at Ayia Triadha there is a similar L-shaped veranda opening onto a terrace, and at the Villa of the Lilies at Amnisos, and the Little Palace at Knossos, such columned porticoes leading to terraces are also present (Graham 1987: 95). Although he writes that "the columned porticoes opening on garden terraces" were a feature of the Men's Halls at the palaces (Graham 1987: 95), if his methodology is followed, it surely would be possible to see these villa locations as suitable for gardens also.

The excavators of Mallia were perhaps the earliest to suggest a specific location within the palace for a garden. They note that the badly ruined northwest area of the complex was possibly converted to a garden or even terraced during the Neopalatial period (Chapouthier and Demargne 1962: 64). This location lies beyond a portico to the north of area III, the set of rooms considered as the residential quarters of the palace (fig. 177). They elaborate: "il est possible ... qu'une zone dégagée, de jardins peut-être, se soit étendue, au-dessus du niveau de

la première époque, sous les yeux des habitants du megaron III.7" (Chapouthier and Demargne 1962: 37). Later writers on Mallia agreed with this supposed function for what would otherwise be an unexplained open space, stretching as far as the paved path at the north, and eastwards to the wall of the northwest court (Pelon 1980). More recently, Platon suggested extensive gardens on the terraces of the hill at Zakros north of the palace entrance, where retaining walls contained no evidence of buildings (Platon 1985: 92; 255). For him, the fertile land at the site made cultivation of gardens possible, "which must have added to the attractiveness of the premises and provided a pleasant resort for members of the royal family"(Platon 1985: 79-82). MacGillivray suggested a garden location between houses in Palaikastro (Shaw 1993: 680), and the excavators of LM IIIc Kavousi Vronda also suggested that the open area between Buildings G and I could have been a garden (Gesell *et al.* 1995: 82). La Rosa pondered the existence of a garden in an area without MM or LM structures to the south of the Piazzale dei Sacelli at Ayia Triadha (La Rosa 1988: 330). Tsipopoulou has followed suit, and posited a garden running across 40 metres of downward-sloping terrain to the southwest of the palace at Petras, between it and the workshops, again because no architectural remains were found in this area (Tsipopoulou 1997: 272; Tsipopoulou 2003: 47). Shaw wondered whether the Oblique Building at Kommos may have had a garden in court 13 (Shaw 1979: 170). Finally, the area around the cistern at Archanes has been interpreted as a garden space (Sakellarakis and Sapouna-Sakellaraki 1997: 316).

All these archaeologists have failed to clarify whether they have an actual planted garden in mind or rather an area arrayed with potted plants, although Graham's illustration perhaps suggests the former (fig. 178). Obviously for a garden to thrive, there must be adequate soil to enable the plants to grow. Soil can be imported from elsewhere to form the basis of a garden, should it be lacking in the area in question, and manuring will improve fertility. The Aztecs solved the problem of lack of suitable land for gardens at Tenochtitlan by piling mud from the lake bottom onto wickerwork rafts to form *chinampas* or floating gardens (Soustelle 1961: xvii). Hieron II, ruler of Hellenistic Syracuse, even had a garden constructed on a ship, transporting soil out to the vessel to form flower-beds on deck (Thacker 1979: 19). The Minoans could certainly have done likewise, but if these areas had been filled with soil for flowers or shrubs, surely some traces would have been found during excavation? This has been the case in recent finds of gardens, such as at the Hellenistic Governor's Palace at Jebel Khalid, on the west bank of the Euphrates. In the courtyard here the excavator discovered "stone-less, rich brown, nitrogenous soil (not the light grey wind-blown dust that

accumulated over time elsewhere)" (Clarke 2001: 218). For all that early exploration was not up to modern standards of palaeobotany, archaeologists were still capable of noting changes in soil types. Indeed Evans himself noted carbonised particles and burnt wood in the earth at the Caravanserai (PM II.1: 123). If, for example, the area by the Hall of Double Axes had been a garden, the different soil found here would not have gone unnoticed.

Although none of the above sites have provided any kind of pedological or palaeobotanical support for the idea that they may have been gardens, they should not be dismissed. The areas can be split into two types: medium-sized spaces with no buildings on them (Ayia Triadha, Kavousi, Mallia, Palaikastro, Petras and Zakros); courtyard areas, often adjoining residential quarters (Knossos, Kommos, Phaistos, Archanes and Mallia again) as well as courtyards at sites where gardens have not been explicitly claimed. In fact, both such spaces have analogies among the gardens of the ancient Mediterranean, which may support claims for Minoan gardens in these locations.

Courtyard gardens tended to be small areas forming a bounded unit within a larger architectural complex, with rooms leading directly onto to it. This type of garden is most familiar from the Roman period, and the numerous peristyle courtyards excavated at Pompeii provide a good idea of both the layout and plants used (Jashemski 1979) (fig. 179). It has many precedents though, such as the courtyard gardens of Hellenistic monarchs (Nielsen 2001: 177-180). One such garden comes from the 3rd Winter Palace of Herod the Great at Jericho, where a colonnade surrounded a tree-planted area, and pots for further plants were sunk into the ground (Gleason 1993). Various Ptolemies and Seleucids also had such gardens incorporated into their palaces. Going further back in time, excavations at the 14th century BC palace at Amarna have revealed a courtyard garden, once more featuring a pool and flowerbeds (Carroll 2003: 26). All these gardens seem to have had both official and private functions; for the residents of the palaces or houses to enjoy, as well as serving as venues for small official functions and dining. The second possible type of Minoan garden is the larger open space adjacent to elite structures, and again there are parallels with other Mediterranean societies. These gardens, used by royalty and important guests in the Near East, were adjacent to, but not necessarily connected to the palaces and were of greater size than courtyard gardens (Wiseman 1983; Nielsen 2001: 166). Gardens with exotic plants, animals and water-features from Nimrud, Nineveh and Babylon fall into this category (Foster 1998: 323; Wiseman 1983: 142; Albenda 1976; Albenda 1974). Recent discoveries at Petra have shown that a large garden terrace

accompanied by pools, a waterfall, and an island pavilion existed to the east of the Great Temple Complex (Bedal 2002). The purpose of these constructions was to impress and awe the visitor. These gardens should also be distinguished from the larger hunting parks, or *pairidaeza*, which were found outside the cities of the Near East (Carroll 2003: 45).

Turning back to the Minoan evidence, it is obvious that the courtyards suggested as gardens are all relatively small and adjacent to the so-called residential quarters, lack pools, and with the exception of the Mallia example, are all paved. Stone paving of courts is not conducive to good drainage to avoid flooding of roots, nor to the growing of large trees or shrubs. Indeed, if large trees were grown in such areas is seems likely that their roots would have damaged the paving and surrounding walls, as well as blocking the light and air circulation. No traces of raised soil beds or tree roots were reported from excavations, and so it is suggested here that such courts and verandas would have held plants in various shapes and sizes of pot, as discussed further below. As for the second type of garden, beyond the intriguing blank spaces listed above, is there any other evidence such a garden existed in the Aegean Bronze Age? Certain wall paintings have been interpreted rather tentatively as showing tamed rather than wild landscape, a park comparable to those of the Near East (Morgan 1988: 39-40; 92). Both the so-called Nilotic frieze from Akrotiri (fig. 27), and the Birds and Monkeys fresco from the House of the Frescoes at Knossos (fig. 71), combine exotic, perhaps imported animals, and likewise plants of foreign origin, such as date palms and papyrus. Is it possible that such scenes represent large gardens or parks belonging to Minoan elite, and one which would be extremely difficult to identify archaeologically? Such large parks could not have been enclosed within architectural complexes but situated in areas of greater space. Nevertheless, the larger garden areas within the palaces and towns may have been scaled down versions of these parks, perhaps stocked with similar animals or plants.

It is worth mentioning too that the Assyrian ruler Sennacherib had an artificial swamp constructed, where he planted reeds and populated it with herons, wild pigs and other animals (Foster 1998: 324). Were the Nilotic and Birds and Monkeys frescoes not just images of parks but of a whole hydraulically-engineered environment? Another marshy scene come from Tell el-Dab'a (Bietak 1996: 75), and marshy land is implied by the reeds shown in the Ayia Irini landscape and Xeste 3, 3b (Abramovitz 1980; Vlachopoulos 2000). Other frescoes, such as the Caravanserai Blue Bird, and the monkeys from Building Beta at Akrotiri feature undulating bands of blue, although these have not been interpreted as rivers. On

the other hand, it may be possible to interpret these frescoes not as depictions of actual parks and marshes, but as conceptual gardens. The key elements in the 'cultural package' of elite gardens are included (water, exotic animals and birds, exotic plants). The painting of such a scene would indicate the owner's membership of that elite group who could create artificial landscapes. Like the 17th century Dutch tulip paintings, perhaps if owning an actual garden was not possible, commissioning a painting of one was the next best thing.

(ii) Rock gardens?

Maria Shaw is one scholar who has gone beyond mere hypothesis and believes she has found solid proof of a garden at Phaistos. Although Graham had already considered the southeast corner of the east wing as one of his possible garden locations, Shaw goes further, believing this location "would have been perfect for a Minoan rock garden." (Shaw 1993: 680). A rocky outcrop exists here (fig. 180), separated from rooms 63b, 63d and 63e by a wall, and edging onto court 64 to the north (Shaw 1993: fig. 20). In fact, the rock was cut back to make room for the court here (Shaw 1993: 682). Access to the court was from room 63, the Minoan hall to the west, while to the east the plains of the Mesara stretch out, the view unhampered by any further building. The actual rock itself is pitted with small holes, ranging from 10-30 cm. wide and 6-10 cm. deep (Shaw 1993: 683) (fig. 181). Shaw suggests that some of the holes may have been used for planting bulbs, such as crocus, iris or other small plants, while the larger holes could have contained whole flower pots (Shaw 1993: 683). The flowers grown in this rocky bed may have been changed with the seasons, and, Shaw adds, may have had some religious meaning, the nearby lustral basin adding weight to this idea (Shaw 1993: 685). She concludes by suggesting that this rocky outcrop and court "would have been a sacred garden that was also cultivated, one in which the naturalness of the original landscape was largely maintained." (Shaw 1993: 685) (fig. 182).

Shaw's argument appears convincing and the location of a MM well in the court (Shaw 1993: 683: n.81) would provide the water necessary for a garden. Furthermore, she cites the Spring Fresco as a possible example of such a rock garden in full bloom in support of her idea (fig. 23), and also explains ways to avoid the disastrous waterlogging of the bulbs in the rock-cut holes (Shaw 1993: 685). Planting holes cut into bedrock have been noted around the Hephaistion in Athens, and at the Round Building of the Sanctuary of Apollo Hylates at Kourion in Cyprus (Thompson 1937; Soren 1987: fig. 20).[55] In both these instances the holes are larger than those at Phaistos though, and are cut into the ground surface as opposed to an outcrop. Not all scholars agree with Shaw's interpretation of the

[55] Thanks to Giorgos Papantoniou for providing me with information on the Kourion rock garden.

rocky area. Another possibility is that the area was used for food-processing in Prepalatial times (Hitchcock 2000: 173). Bedrock mortar sites have been reported from numerous locations, ranging from California to Cyprus, as well as at Petras on Crete, where a pestle was found *in situ* (Hitchcock 2000: 173). The excavator suggested the concentration of EM IIb rock-cut mortars and basins on the east flank of the site indicated a communal workspace (Tsipopoulou 1999: 848). Surely it must be possible to distinguish between a mortar or basin, and a cutting for growing flowers (i.e. the mortar would have a smoother, polished bottom and sides). The holes from Phaistos should be compared with those at Petras and indeed any more such holes which may have passed unremarked from other sites to see whether rock gardens were a feature of Minoan architecture.

Turning to the mainland may help substantiate Shaw's claim, or at least a general claim for planting in rock-cut holes in the Bronze Age. Courtyard 47 of the palace of Pylos features 14 sinkholes, all lined with pebbles, and all circular in shape, apart from one triangular exception (Cooper 1998-1999: 49). Blegen was not sure how to interpret them, and wondered whether they were for erecting a fence or shelter, or even for holding looms (Blegen and Rawson 1966: 208; (fig. 183). Moreover, the excavation notebooks for that area indicate that a quantity of 'flower pot ware', a red coarse fabric from straight-sided vessels, came from the courtyard (Cooper 1998-1999: 50). It has been suggested therefore that the holes, which flare outwards from top to bottom, held flowerpots, and that the pebbles and shape of the holes both contributed to drainage after watering the plants (Cooper 1998-1999: 50). Hence a Mycenaean rock garden is suggested for this courtyard (Hollister 1998). Interestingly, like the garden areas in Minoan palaces, this court can only be accessed through the possible "residential quarters" (Hall 46, known as the Queen's Hall).

(iii) Flower Pots

Creation of a garden does not necessarily demand beds of soil, as plants can be grown in pots. While plant size is a limiting factor, there are few other hindrances to such a practice. Indeed, one advantage is the mobility afforded by pots: they can be transported to a garden from a different location; moved around on a whim to recreate the garden in a new design; brought to sheltered areas during cold weather if necessary; and, of course, easily replanted each year with different plants. Le Nôtre, Louis XIV's gardener at Versailles, claimed that 2,000,000 flower pots were in use at Trianon (one of the lesser gardens) to allow for a constant supply of flowers in bloom in the parterres (Thacker 1979: 157). Not every garden functions on such a grand scale, but the practice of growing plants is pots in

attested across a broad range of societies, as well as over time. Did the Minoans grow flowers in pots or create gardens using containers? Evans certainly believed that the palace of Knossos was brightened up with pot plants. He thought that the larger light wells and the Central Court would have held tubs with large plants chosen for their fragrance or bright colours (PM II: 277-279), demonstrating how he considered the notion of potted plants as integral to his Minoan ideal. M. Platon also saw pot plants as a feature of the palaces, suggesting the verandas were decorated with coloured flowerpots and ornamented flower-vases (Platon 1987: 227).

Ceramic remains

Actual remains of ceramic flower pots have been tentatively identified by some excavators working with Bronze Age material. Evans suggested that the pots he discovered at Knossos which had holes in the bottom were flower pots (fig. 184). These vessels came from the deposit beneath the East stairs, and were probably LM Ia in date (PM III: 277). More such pierced vessels were found on the roof terrace of the Temple Tomb (PM IV.2: 1002). Marinatos followed suit when he uncovered vessels with perforated bases at Akrotiri (Thera III: Pl. 51; Pl. 52.1). His flower pots are a different shape to those of Evans, being taller and thinner, as opposed to the squat ones of Knossos (fig. 185). Also the holes in the base of the Thera examples are much smaller. These vessels also have small lugs level with their rims, whereas those from Knossos do not have any form of handle. Three of Marinatos's pots are undecorated, while two others show a leafy motif in light-on-dark. Similarly, two of Evans's pots are also decorated in a light-on-dark style, again with leafy or grassy motifs (PM III: Fig. 186), and he reports that those from the Temple Tomb had similar decoration (PM IV.2: 1002). The excavators of Archanes report finding "numerous fragments of flower pots" in the vicinity of the cistern, but no further detail is given so their form is unknown (Sakellarakis and Sapouna-Sakellaraki 1997: 114). Platon also reports flower pots with "attractive typical decoration" and pierced bases at Zakros (Platon 1985: 255).

Obviously the holes in the bases of these vessels preclude them from being vases, i.e. vessels for holding living flowers in water, as the water would rapidly run out of the bottom, although the option of dried flowers is always possible. Comparison with ceramics from other cultures backs up the flower pot theory. Plant pots have been recovered archaeologically in a number of places: the Roman palace at Fishbourne, several sites in Campania, the palace of Herod in Israel, and the temple of Hephaistos overlooking the Athenian agora (Farrar 1998: 165).[56] In each of these instances, the pot was intended to be sunk into the ground with the

[56] Thompson 1937 includes a complete catalogue of flower pots recovered from the Agora.

plant inside it, rather than left on the surface as a moveable feature. Theophrastus was aware of this planting practice, noting that the citron "is also sown, like date palms, in pots with a hole in them" (*Hist. pl.* IV: 4.3). The pots from the garden of the 'House of the Ship Europa' at Pompeii have holes not just in the base, but around the belly too, which allow roots to break free beneath the soil (Jashemski 1974: 399-400; fig. 4). Such holes are mirrored in the examples from other locations (fig. 186). Cato even recommends that before planting in the ground, pots should be broken (*Agr.* 52), and deliberately smashed planting vessels have been recovered from archaeological contexts (Carroll 2003: 89).

Yet the pots recovered from Minoan contexts are different to these planters. Not only do they lack holes around the sides, but they are decorated. It would certainly be most unusual if pots destined to be buried in soil were carefully painted, especially when other contemporary vessels were left undecorated. Just such reasoning led Thompson to conclude that a small flower pot from Olynthos with a well-finished exterior must be an ornamental pot rather than a planter (Thompson 1937: 409; fig. 11). The conclusion must be that if the Minoan vessels are for flowers, they must be for holding plants which actually grow in the vessel in a soil matrix, and are kept above ground. The relatively small size of the pots in question indicates that the plants grown in them must have been also quite small - perhaps bulbous plants could be suggested? Marinatos recovered organic remains from Delta 2 at Akrotiri: a plaster cast of the find recalled the shape of a small onion, and it was associated with membraneous remains (Thera IV: 43). Could this in fact have been a bulb of a flowering plant, like a lily or iris? Even though this find comes from a possible storage context, it is not unusual to store lily bulbs in a cool, dry place after flowering, in preparation for planting again next season. Dawkins's idea that the Minoans grew bulbous plants suspended in water is also interesting, although it would be impossible to identify this practice based on ceramic remains (Dawkins 1939: 104). A further type of ceramic vessel has been identified as a vase for cut flowers, as it has holes around the top to support the stems (figs. 187-188).

Frescoes

Further evidence for a possible Aegean habit of using flower pots can be found in some of the wall paintings. An intriguing fresco fragment from Galatas, dated to MM IIIa, may show part of a wooden container for plants. In this instance papyrus is suggested as growing in it (Rethemiotakis 2002: 57) (fig. 189), perhaps indicative of how this plant could have originally come to the Aegean. From the window jambs of room 4, of the West House, Akrotiri, two painted flower pots can be

seen. These vessels are different in style to those discussed above, appearing as tall jars, narrow at the base and widest around the shoulders, and tapering back in at the rim (fig. 190). The vessels are painted in different coloured horizontal bands, perhaps intended to indicate some sort of "veined marble" (Thera VI: 25), like that used for dozens of other Bronze Age vessels (see Warren 1969 for examples). Tall red lilies rise from these two pots. As the base of the vessels is not depicted, the existence or lack of holes there is unknown, but certainly the visible sides remain unpierced. It must be asked, assuming the painting reflected a real pot, was it one filled with earth and bulbs, or one with water and cut lilies?

Nanno Marinatos believed that the flowers were growing in the vessel, and alluded to real flower pots which would have been placed on the window sill for festive occasions (Marinatos 1984b: 48). Yet such a tall vessel is an unusual shape in which to plant bulbs. It is far deeper than required by lilies, or other bulbs, and the narrow rim means that the full width of the vase at the shoulder could not be used for planting, as the shoots could not all grow out of the opening. Certainly it would be possible to place only a few bulbs in the very centre of the pot, but there would then be a lot of extra soil in the vessel, adding to an already substantial weight (especially if made out of stone). On the other hand, a vase this size filled with water would be equally heavy, and it should not be expected anyway that past societies always acted in a fashion which seems logical to 20th century minds. That the lily stems do not rest against the side of the rim, as cut flowers do in real life, should not necessarily be seen as an obstacle to the interpretation of a vase. As was demonstrated in chapter three above, exact copying of the natural world has often been sacrificed by artists who prefer to compose a symmetrical picture, or one that highlights the key features of the plant involved. Conclusive evidence for cut flowers or plants grown from bulbs can not be found in this case, but there are other painted flower pots which need to be considered too.

The fresco from the villa at Amnisos includes plants growing in some form of large container. White lilies, irises, and either vetches or sage, as well as mint and *micromeria* have all been identified in this MM IIIb/LM Ia scene. Although fragmentary, the paintings of this room have been reconstructed by Cameron (Evely 1999: 183) (fig. 37). The west wall featured a long container, with another smaller one either on top of it, or behind it, depending on the perspective (Schäfer 1989: 86) (fig. 57). Cameron restored similar small containers on the south wall. The containers are concave at the waist, but not very deep, giving an overall impression of a squashed hourglass. They are painted with brown and white horizontal stripes, possibly indicating wood. Shaw notes the possibility of a similar

container in a fresco from Zakros, where large leaves rise from an architectonic base (Shaw 1993: 668, n.38). Certainly these vessels are of a shape suited to actually growing plants, rather than filling with cut flowers. The plants are also depicted with their leaves sprouting at the base, possibly indicating they are actually growing in the pots. This would put lie to the idea noted by Shaw that the containers were not hollow but merely platforms or altars (Shaw 1993: 668, n.36). Schäfer wondered whether actual vessels in this shape were imported from Egypt to Crete, based on the similarity between their shape and the hieroglyph *MR* or *MRW*, meaning "lake" or "water channel"(Schäfer 1989: 85-86). This led him to believe that the Amnisos fresco represents a Minoan sacred garden with deliberate Egyptianising traits.

Interestingly, a container of similar shape is depicted on an electrum goblet from Shaft Grave IV at Grave Circle A, Mycenae (fig. 148). This vessel, dating from c.1550-1500 (i.e. slightly later than the Amnisos painting) is inlaid with gold and niello. The fern-like plant growing from the pot has been suggested to be dittany (Higgins 1997: 150). Although very small and so difficult to identify, seeing this plant as dittany, a plant endemic to Crete, leads to intriguing speculation about why it would be depicted on a high-status object. On the other hand, Hood does not see a growing plant at all, but an altar bedecked with flowers (Hood 1994: 157).

Other plant containers

Plants can be contained in vessels other than purpose-made ceramic pots. Broken amphorae were reused as planters in Roman times as attested from remains at Oplontis, Tivoli and Rome (Farrar 1998: 165). Similarly, broken jars were used to plant Adonis gardens in ancient Greece, as depicted in vase-paintings (e.g. Thompson 1963: fig. 50). Contemporary gardeners use old boots, old tyres, kettles, milk cartons, jam jars, and numerous other hollow receptacles to plant in, although looking for evidence of such enterprising gardening from the Bronze Age is probably futile.

Baskets, however, although unlikely to survive in most archaeological contexts, have been used as containers for plants since ancient times. The example of the incense trees brought back from Punt for Hatshepsut, carried in baskets slung between poles, shows this was a viable way to transport living plants (fig. 33). The tribute from Punt shown in the tomb of Rekhmire also features the same 'tree in a basket' image (fig. 191). In Roman times, baskets were an essential part of gardening equipment, and Pliny the Elder and Cato include them alongside

ceramics as suitable vessels in which to plant cuttings (*NH* XVII: 97; *Agr* LII; CXXXIII). Iconographic evidence shows that baskets were used for plants in the Bronze Age too. Evans considered that the monkeys in the Saffron Gatherer fresco from Knossos were picking the flowers and setting them into bowls (PM I: 265) (fig. 72). Others have seen the animals as pulling the flowers out of bowls (Shaw 1993: 670). Recent interpretation of the fresco however has suggested that the vessels are in fact baskets (Beloyianni 2000). Baskets can be more easily identified on the Saffron Gatherers fresco from Xeste 3, Akrotiri (fig. 192). Here the women add picked crocus blossoms to their baskets, even apparently offering the fruits of their labours to the 'goddess' in such a vessel. A Minoan stone vessel shows a similar container; a fragment of a rhyton from Knossos depicts a man placing a basket (filled with offerings?) before a shrine (Rutkowski 1986: fig. 95). Iconographic evidence suggests therefore that whether they were used in the fields to collect flowers, or to offer them to deities, or even as flower pots of a less durable nature than ceramic, baskets provide another example of how plants must be thought of as mobile items, rather than rooted continually in one place.

Wooden vessels may also have been used to hold plants, in particular as large containers for trees. Marinatos has considered the role of trees in ritual in glyptic art, and uses the term "constructed tree shrine" to describe such wooden structures (Marinatos 1989). She favours an interpretation where the tree grows on top rather than within them, and concludes that a tree, with or without a wooden construction, is an additive element placed on top of a shrine on special occasions (Marinatos 1989: 139; Marinatos 1990b: 86-87). Others prefer to see the structures as indicative of a form of sacred enclosure which surrounds the tree, either of wood or stone-built. Rutkowski, for example, when writing about the Mochlos ring, concludes that it shows a sacred tree protected by a wall (Rutkowski 1986: 101) (fig. 34). The idea of such scenes depicting the "temenos of a sacred grove" can be traced back to Evans's own interpretation of confined trees such as the one seen on the steatite fragment from Gypsadhes (Evans 1901: 102; fig. 2). It may be possible however that there are more than one type of container for trees; a portable, wooden one, which is depicted when trees are shown on boats, and a fixed version, indicative that the tree has arrived at its designated location.[57]

(iv) Water

Perhaps the most vital element for a garden is provision of water, particularly when situated in a hot, dry climate. Whether the plants are growing in soil beds, or in pots, watering is essential to ensure their well-being. Water can be incorporated into gardens in a variety of ways, such as fountains, pools, artificial

[57] See Vallois 1926 for a categorisation of altars and tree containers.

lakes, and channels, as well as using nearby wells, springs or rivers. If some of these are big enough, they can also be navigated, whether for rituals such as rowing the goddess Mut on the lake at Karnak (Wilkinson 1998: 127), or pleasure, such as entertaining the king on a gondola on the Canal at Versailles (Thacker 1979: 155). Such varied water features were not only impressive, and pleasing to the eye and ear, but useful too for irrigating plants. In Egypt, for example, a mechanical device to raise water out of these ornamental channels, the *shaduf*, helped irrigate the gardens (Carroll 2003: fig. 63). In dry countries however, it is not enough to just provide water, but methods for retaining the water must also be devised. The rooftop terrace of the Hanging Gardens of Babylon was reputedly built on a base of "a layer of reeds laid in great quantities of bitumen, over this two courses of baked brick bonded by cement, and as a third layer a covering of lead" (*Diod. Sic.* II: 10). This helped prevent water, pumped around the terraced garden by machinery, from escaping out of the soil. Another method is to form a raised mud bank around the base of the plant to retain water in a mini-reservoir, as is sometimes portrayed in Egyptian paintings.

The search for gardens in Minoan Crete must therefore be accompanied by a consideration of the provision for watering the plants. About ten rivers on Crete are currently estimated to flow to the sea all year round, and many other streams are frequently low or empty (Rackham and Moody 1996: 41). This necessitates developing a way of bringing water from further away, or the sinking of wells and/or the construction of cisterns. Archaeological remains of this nature and their implications for gardens are considered in this section in some depth. The focus is on elite architecture, as the connection between gardens and the upper levels of society has already been established.

Rivers, aqueducts, springs, reservoirs and cisterns

The Knossos area is well-watered by Cretan standards, with the river Kairatos flowing to the east of the palace, and its tributary, the Vlychià, bounding it on the south, as well as the numerous springs and the high water table in the area (Roberts 1979: 231). Here Evans discovered what he believed to be the remains of an aqueduct, bringing water to the palace from further west up the Vlychià gorge (PM II.2: 462). Minoan-style stone blocks formed a roofed water conduit leading away from the Mavrokolyvo spring, and he concluded that it was "no doubt one of the sources of water-supply" for Knossos (PM II.2: 463). Since Evans's time however, no further work has been done on this topic.[58] Remains of such basic aqueducts, channelling water from outside palaces or villas, have not been

[58] This aqueduct is no. 288 in Hood and Smyth's (1981) survey of the Knossos area. They did not discover any new remains of Minoan hydraulics.

reported from elsewhere. Protopalatial check-dams were identified near Kamilari however, probably creating reservoirs to supply water to the nearby settlements (Watrous and Hadzi-Vallianou 2004: 282).

Zakros palace is apparently unique, featuring the first example of water being provided inside a palace direct from the source (Platon 1985: 199). Room LXII, in the East wing, is known as the Hall of the Cistern (fig. 193). The large circular feature there retains water which springs from an underground source (Platon 1985: 185-190). Access to this room is from the Minoan hall to the west through a pier-and-door partition (Hitchcock 2000: 174), therefore it is undoubtedly linked with the main palatial building, although there may also have been another entrance to the east, now destroyed by cultivation (Platon 1985: 190). To the southwest of this area is the Spring Chamber/Well of the Fountain, room LXVIII (fig. 194). Steps descend beneath a stairwell, leading down to a chamber where water flows into a basin from an opening in the north wall (Platon 1985: 193). Unlike the cistern, this chamber can only be accessed directly from outside the palace proper (Hitchcock 2000: 95). A circular cistern of comparable proportion came to light beneath a modern building at Archanes, also enclosing a spring (Sakellarakis and Sapouna-Sakellaraki 1997: 112; PM II.1: 64). Evans thought of Archanes as the location for the summer palace of the Knossos kings, and the more recent excavators of the site believe the LM cistern to be "undoubtedly part of the Palace Building," possibly with a garden veranda to the west (Sakellarakis and Sapouna-Sakellaraki 1997: 112-113; 316). Another round cistern of similar dimensions comes from Tylissos, although here the structure is reported to be of LM IIIb date (PM II.1: 65). Furthermore, this example does not benefit from a spring, but rather seems to have been filled via a network of pipes and channels (Hazzidakis 1934: 62).

The Caravanserai at Knossos is the site of another spring house, used in LM Ia-IIIa (Rutkowski 1986: 124), but has received relatively little scholarly attention.[59] At the western edge of the site can be found a spring chamber, in an annex separated from other buildings (PM II.1: fig. 48). Water bubbled up from the ground into a rectangular basin, which was floored with pebbles and reached by descending three steps (PM II.1: 123-124). A ledge ran around the chamber, perhaps for sitting on or for holding lamps, like the niche at the rear (PM II.1: 127). Such a ledge also is part of the construction of the Zakros chamber, here thought to be for "ornamental flower pots" (Platon 1985: 194).

There have been several suggestions about the functions of these cisterns, apart

[59] See PM II.1 and Schofield 1996.

from simply storing water. Platon offered a number of interpretations for his discovery at Zakros: the "first instance of a private swimming pool in prehistoric times" or an "aquarium for local and exotic fish", a theory he tested by throwing fish into the pool (Platon 1985: 188). His third suggestion is that the cistern was "to add to the magnificence of the space and to provide a picturesque element" (Platon 1985: 190). Could such structures have been akin to the pools in Near Eastern gardens, adding an extra element of luxury to the complex? Hitchcock elaborates that as the cistern was visible from the Central Court, and adjoining the Hall, it may have been the site of rituals involving bathing (Hitchcock 2000: 174). Certainly one feature which is shared by all three circular cisterns is the provision of steps allowing ease of access down into the interior of the structure. The springs at Zakros and the Caravanserai have both been suggested to be of sacred character too. Offerings were recovered from these two sites: Neopalatial cups, olives, and a double-axe base from Zakros (Hitchcock 2000: 96), while Evans reported LM IIIb-c bowls, remains of food offerings, incense burners and a hut urn from the Caravanserai spring (PM II.1: 128-136). Certainly sacred water sources and water-based rituals are a feature of many societies around the world, past and present, and so it should not necessarily be a surprise to find them in the Aegean Bronze Age.[60]

Wells

There are few recorded examples of wells from Minoan sites, the most famous perhaps that at Zakros, located off the Central Court at the southern corner of the east wing (fig. 195). It was adjacent to the workshops, which would have made use of water in their daily activities. Steps led down to a platform giving access to the water (Hitchcock 2000: 95), where the remains of a timber hoist could be seen (Platon 1985: 196). This well contained cups, dishes, olives, pumice, grape seeds, branches and animal bone, which Hitchcock interpreted as offerings to a deity (Hitchcock 2000: 96). On the other hand, Rutkowski believes these finds "could have landed in the basin by chance" during daily use of the well (Rutkowski 1986: 125). Evans detected a number of wells around the palace at Knossos: on the terrace above the wall with the stone spout; beneath the lower section of the Stepped Portico; in the east portico of the Hall of Double Axes; above the Little Palace; on the slopes of the Gypsadhes hill; in the town area to the northwest (PM III: 254-255). Interestingly the well from the town area was lined with terracotta drums, each pierced by a triangular hole, perhaps to provide footholds for climbing in and out (PM III: 255-256). Complementing the archaeological evidence, iconographic evidence for a built well comes from the miniature frieze in the West House at Akrotiri. On the north wall, a small structure flanked by water jugs can

[60] Peatfield 1995 discusses Minoan water rituals.

be seen near a large tree (Morgan 1988: 39; fig. 16) (fig. 196).

Drains, stone channels, terracotta pipes and basins

While remnants of drains and water channels can be found at numerous Minoan sites, one of the most complex systems existed at Knossos. Until recently little was known about the drains below the palace of Knossos, apart from the fact that they existed and seemed to "excite the wonder of beholders," as Evans admiringly put it (PM III: 252). Explorations by MacDonald and Driessen have allowed the drainage system of the Domestic Quarters in the east wing of the palace to be mapped out and analysed thoroughly (1988; 1990). Two functions have been suggested for this complex system: channelling away excess water from the palace (i.e. from rain), and sanitation (e.g. PM I: 225-230). That some system was necessary to deal with the amounts of rainwater which could have entered the complex via the numerous unroofed courts and light wells is undoubted. Run-off from the roofs would also have had to be directed out of the buildings. There is still debate, however, over whether such drains were also for disposing of sewage, considering the long, twisting route they followed beneath the Domestic Quarter, entailing the waste remaining in the system for some time.

Stone channels can be found at other locations at Knossos, as well as other sites (e.g. Zakros, Caravanserai, Tylissos, Vathypetro, Archanes, Palaikastro). It appears that their main purpose was to drain water away from the structures, while they were rarely used to bring fresh water into the buildings (Shaw 1973: 126). This was the function of the terracotta pipes evident at many sites (e.g Knossos, Tylissos, Phaistos, Mallia). A complete catalogue of known terracotta piping can be found in Shaw 1973 (235-236).

Hand in hand with the systems of channels, pipes and drains, a number of basins can be noted. Several functions have been suggested for these basins, including settling tanks, laundry tubs, footbaths, drinking troughs, ornamental pools, and fulfilling hydraulic engineering needs. This multiplicity of propositions relates in part to the differing shapes and sizes of the basins. The basin at the Caravanserai, measuring 1.52 x 1.38 metres, and c.45 cm. deep, is built of ashlar slabs and has a gypsum bottom (PM II.1: 116-118) (fig. 197). Access is from both sides, down steps, and there were traces of frescoes on the surrounding walls (PM II.1: 120). Evans, in keeping with his view that the Caravanserai was a resting place for weary travellers, interpreted this basin as a footbath (PM II.1: 104). Just outside this basin on the north side was another smaller one, a "drinking trough for beasts" (PM II.1: 119). The East Bastion at Knossos features a remarkable MM III

system of a stone channel with interspersed basins running down beside the staircase (PM III: fig. 168) (fig. 198). Not only do these function as settling basins, to allow impurities in the water to sink to the bottom, but also serve to reduce the speed of the water as it descends, and so control splashing. Evans presumed a larger basin lay at the foot of this cascade, where he envisaged linen being washed by "Minoan Nausikaas" who "may have made their way here from the Palace halls above." (PM III: 143). No basin remains in this location however. An earlier settling tank was identified in the northwest of the Central Court (PM I: 230, n.1), and also in the Court of the Distaffs a basin collected water and directed it into the Main Drain (MacDonald and Driessen 1988: 248). At Tylissos, another basin, again interpreted as a settling tank, was found along the west wall of House C (Shaw 1973: 127). The earliest stone basin comes from the first palace at Phaistos, on the lower terrace of the West Court; Pernier saw this as a place for animals to drink or people to wash en route to the West Entrance (Hitchcock 2000: 95). Basins of terracotta have also been found at Phaistos (Shaw 1973: 204; 236).

Lustral basins, bathrooms and toilets

Evans coined the term 'lustral basin' to describe small rooms where he believed ritual lustrations had been carried out, yet nowhere does he explain how they differ from those rooms he identified as bathrooms (Graham 1967: 99). These rectangular lustral basins were accessed via a staircase and often lined with gypsum or stucco, and sometimes associated with small finds of a ritual character, such as oil flasks or rhyta (Rutkowski 1986: Table III). It is unlikely that such rooms were for total immersion in liquid - they have no drains (although could be emptied by bailing or sponging), and terracotta bathtubs are perhaps more likely to have fulfilled the bathing requirements (Graham 1967: 264), although it seems that such tubs were not in common use earlier than MM III-LM Ia (Rutkowski 1986: 135). Graham points out that the portability of such tubs may also explain why they are generally not found *in situ* in bathrooms (Graham 1967: 105). Evans's discovery of painted tubs in the most westerly room of the Caravanserai added to his vision of the buildings as some sort of hostelry for travellers, commenting "privacy was here secured for real 'tubbing' in the clay hip-baths in vogue among the Minoans" (PM II.1: 122). While there is no provision for water supply to this room, the hearth could have been used to heat water for the tubs (Schofield 1996: 29). Although the details of Minoan baths and ritual ablutions remain a mystery, what cannot be doubted is that certain rooms existed where some form of manipulation of liquids took place.

Evans marvelled at the fact that the Minoans seemed to have toilets which far

surpassed those of many countries in Victorian times (PM I: 230). He identified a latrine in the Domestic Quarters, west of the Queen's Megaron, where an opening over the main drain allowed waste to be carried away through the system (PM I: 228-230; figs. 171b-c). More recently this interpretation has been queried, and while unmistakably connected with liquid in some way, it may be more likely that this room was a preparation room for cult practices (MacDonald and Driessen 1988: 252). Other Minoan toilets are Mallia at House Za and Da, and III(2) of the main palace; 63e at Phaistos; beneath the stairs at Sklavokampos (Graham 1967: 108-110).

Ornamental water: fountains, cascades and ponds.

While Minoan drains, sewage and drinking water have all been discussed in academic literature, there has been little focus on ornamental water, i.e. where its primary *raison d'être* is aesthetic. Ornamental water has long been a powerful tool to express wealth, status and control over nature. Especially in areas where water may be scarce, to utilise it in a non-functional way demonstrates to the masses the power of the owner in wasting such a precious commodity. Evidence for water features in Roman gardens is extensive, including pools, fountains, cascades, and spouts (e.g. Farrar 1998: 64-96). Many Egyptian tomb paintings show man-made pools, Nabataean Petra was well-supplied with water features (Bedal 2002), and Near Eastern rulers created innovative ways of bringing water into their gardens (Dalley 1994). If ornamental water existed in Bronze Age Crete, it must have been in the palaces, considering both the association with the elite and the control over resources that these structures displayed.

Four pieces of painted plaster found by Evans in the House of the Frescoes at Knossos were considered as "clearly some kind of fountain or jet d'eau" (PM II.2: 460). He saw a column of blue water with a forked base spurting upwards, with drops falling on either side (PM III: supp. pl. XXII) (fig. 199). Although neither the Egyptians nor Mesopotamians had such features, Evans was not surprised that Minoan hydraulic engineers could construct such marvels (PM II.2: 462). Cameron undertook a revision of these fragments however, and the fountain idea did not stand up to scrutiny. Rather the new restoration showed the fragments as part of a waterfall (Cameron 1967: 59; fig. 5) (fig. 200). As the fragments of fresco were found with other pieces showing plants, monkeys and a stream, it is possible that water continued from the waterfall to join this stream in a "countryside scene" (Cameron 1967: 62). No archaeological evidence for fountains has been recovered, and while it is perhaps pleasing to imagine the elegant and cooling sprays of water playing in Minoan palaces, it seems unlikely that fountains existed during this

period.

Another source of water which can fulfil both ornamental and practical purposes is the pond or artificial pool. Certainly, the 'footbath' at the Caravanserai could be considered a pond rather than a basin, although the water channels leading in and out of it perhaps mitigate against the traditional interpretation of a pool, which has still water. Turning to iconography, Schäfer profers the theory that pools are visible in the Amnisos frescoes. He suggests that the so-called "battlement motif", a stepped pattern on a dark red background, reflects the border of pools of water in Egyptian New Kingdom imagery (Schäfer 1989: 85; pls. XVI.1-2). Further developing his idea, he thinks that rather than showing a crenellated wall, the Amnisos scene represents ponds viewed from an overhead perspective (Schäfer 1995: 119) (fig. 21). The fact remains however, that if this painting is intended to represent pools in a Minoan context, nothing has been turned up from an archaeological context which compares to them.

Water gardens?

One question which has never been asked to date is whether the Minoans utilised basins, pools or tubs to deliberately grow water plants. Ancient Egypt provides many examples of pictures of ornamental pools teeming with water-lilies and papyrus clumps (fig. 13). Although identified by Möbius as one of the possible plants in Minoan art (Möbius 1933: 25-26), the water lily seems to have fallen out of favour with recent commentators and does not feature in discussions of the Minoan plant repertoire. Is it possible though that the Minoans were familiar with this plant, and that it was grown in Crete in the Bronze Age?

Nymphaea has a world-wide distribution (Conard 1905: 3), but is especially associated with ancient lands of the Nile, where the plant was the emblem of Upper Egypt (Shaw and Nicholson 1995: 164). Two species are native to Egypt, the *Nymphaea caerulea*, or blue lily, and the *Nymphaea lotus*, or white Nile lily.[61] *N. caerulea* has pointed buds and petals, and the flower is held above the water on a tall peduncle, while *N. lotus* has rounded petals (Swindells 1983: 59; 67; Conard 1905: 141; 194). Water lilies pervade Egyptian art, and are seen floating in pools in paintings, painted on to pottery, carved into furniture, and even chalices shaped like them occur. The water lily was symbolic of rebirth in Egypt because, in one

[61] The term 'lotus' has come to be used for water lilies in general, although only the white *N. lotus* is botanically named thus. It is also important not to confuse the Egyptian lotus/water lilies with the lotus of further east, upon which Buddha sits, the *Nelumbo nucifera*. While a member of the Nymphaeaceae family, it is a different genus to Egyptian water lilies (*Nelumbo*), and has different physical characteristics (Swindells 1983: 15; Conard 1905: 126). To further complicate matters, there is a completely separate plant common around the Mediterranean, of the Leguminosae family, called *Lotus creticus* (Polunin and Huxley 1978: 102).

creation myth, the sun rose out of a lotus floating on the waters of Nun, and there was even a water lily god, Nefertum (Shaw and Nicholson 1995: 164; 199). Furthermore, it has been suggested that *caerulea* may have had psychoactive properties, and so was used in rituals (Emboden 1981; *contra* Berst 2002). While there is nothing like this proliferation of water lily iconography in the Aegean, that some may exist is intriguing, and should be investigated.

Regarding the wall paintings of the Aegean Bronze Age, the term "lotus" is used by a number of commentators when identifying a certain motif, based on apparent similarities to the Egyptian lotus motif. In Egyptian art, the water lily is depicted both from the side, and from above, as a blossom or a bud, and often accompanied by leaves (fig. 201). Seen from the side, the flowers tend to be conical, with three main petals, and an even number of secondary petals rising vertically between them (Meader and Demeter 2004: 61). The examples identified in Aegean frescoes show the plant from a side view only. The key difference between these and the Egyptian water lilies is that horizontal rows of petals are easily differentiated running between the three main vertical petals (fig. 202). Cameron identified one such flower being carried by a male processional figure (Cameron 1975: 100; pl. 98b), but the others are so fragmentary it is impossible to tell whether they were decorative borders, in the style of those from Mycenae (Kritseli-Providi 1982: fig.5) and Tiryns (Rodenwaldt 1976: pl. VII), or shown in a pictorial scene. As for water lilies seen from above, considering that in Egyptian art they appear as rosettes, it is theoretically possible to suggest that the plentiful rosette motifs in Aegean art represent a similar view of the flower.

Turning to other iconographic evidence for water lilies, it becomes notable that Evans was keen to identify some ceramic motifs as this plant. He remarked upon an MM II egg-shell cup painted with "the calix of a water-lily as it floats on the surface of a pool" (PM I: 241) (fig. 203). This type of Kamares cup, where the rounded ends of petals appear to grow out of the base of cup, creeping up the sides, occurs more than just this once. Other examples can be found at Phaistos, and not just on cups either, e.g. F421, F6458, F4357. Certainly the spreading out of the petals from the base are indeed reminiscent of water lilies. Surely the effect of such decoration cannot be accidental, i.e. as the drinker drains the cup, the impression of drinking out of a flower is presented to the company.[62] Later pottery also features lotus imagery. As with frescoed rosettes, it is difficult to reconcile every such motif as a water lily, but it should be borne in mind as an option for the plants depicted. Further possible examples of water lilies can be found on jewellery, like the gold lotus bead from the LM Ia Temple Tomb cache

[62] See chapter six for further investigation of this phenomenon.

(PM IV.2: pl. XXXIV), the pendant from Chrysolakkos (Higgins 1979: fig. 13), and the famous 'Master of Animals' piece from the Aegina Treasure (Higgins 1979: 11).

One difficulty which occurs while looking for Aegean water lilies is the frequent confusion between this plant and the papyrus. The main difference is that depictions of papyrus lack the central vertical petal common to the water lily (Cameron 1975: 99). But hybridisation between the two species does seem to take place in Aegean art. In this instance, the central petal is present, but rather than intermediate petals, spikes headed with dots are depicted, a convention for painting papyrus, seen in the papyrus heads from sector Alpha at Akrotiri (fig. 204). Other hybrid examples of water lily/papyrus include those painted on the griffins from the Knossos Throne Room (PM IV.2: pl. XXXII). Moreover, some of the plants called "lotus" by excavators do not correspond with other examples. The one from Trianda is unlike any other example (fig. 205), and Cameron suggested that honeysuckle may be a preferable interpretation (Cameron 1975: 98).

Considering the plentiful iconographic hints, could water lilies have actually grown in Crete? It is quite unlikely that the plant depicted in art is a native Cretan species of *Nymphaea*. Despite Theophrastus's reference to a water lily growing on the island (*Hist. pl.* 9: 13), which Conard suggested to be *N. alba* (Conard 1905: 11), the genus does not thrive there. *N. alba* is presumed extinct on Crete now (Turland, Chilton and Press 1993: 120), and no other species is at home in the Aegean (Jalas and Suominen 1989: 15-17, plus maps). It seems more likely therefore that water lilies, if extant on Crete in the Bronze Age, would have been of Egyptian origin. Both *caerulea* and *lotus*, the Egyptian varieties, are easily raised from seed (Swindells 1983: 59; 67). They can also be raised from their rhizomes, which should be inserted into baskets or pots of earth and lowered into pools of still, or very slow-moving water (Conard 1905: 237; Swindells 1983: 110). This means that even in places where the plant is not native, it can be easily persuaded to grow. Pollination can also be controlled by humans (for details see Swindells 1983: 90). Certain *Nymphaea* are capable of surviving for some time out of water (Sculthorpe 1967: 90), hence facilitating transportation, and so it appears that it would have been possible to transport a water lily to Crete from further afield. Unfortunately, Minoan iconographic evidence does not show water lilies actually growing in pools, and so while it is certain that the motif arrived in the Aegean during the Bronze Age, whether it was accompanied by actual flowers remains unclear.

Summary

Gardens cannot be considered in isolation from their water supply, explaining why this section on water has been included when at first glance it may appear slightly incongruous in this thesis. The inescapable conclusion based on the archaeological evidence is that the Minoans were skilled hydraulic engineers, and that, if they wished, they could provide fresh water as well as construct systems to remove waste water from palaces and villas. Should gardens have been a feature of elite life in the Bronze Age, there would certainly have been plenty of opportunities to provide adequate water for them. Whether drawn from a well, a spring or a cistern, fresh water could have been provided. It is quite normal though for water for gardens to be second-rate, leaving the purest quality for human consumption, so run-off from roofs after rain, or that collected in drainage channels from courts could have been utilised on plants. While there appears to be little evidence that Minoan palaces or villas actually had water for display purposes, it is important to bear in mind the effect, for example, of drainage channels operating in a rainstorm on visitors who may not have experienced such engineering elsewhere. The possibility that water plants were raised by Minoans should also be considered, and reasons why certain plants might be deliberately imported or cultivated are considered in section 5.5 below.

(v) Gardeners?

An important part of owning a garden is the maintaining of the plants therein - watering, re-potting, planting, tidying, harvesting (if necessary) and pruning are all required. From Homer comes the example of Laertes, rescuing his farm from ruin through his own work, and toiling "alone in that well-tended plot, levelling the soil round a tree and ignobly dressed in a patched and dirty tunic" (*Od.* 24: 226-231). Xenophon reports that when Lysander went to visit Cyrus, the king showed him around his paradise garden at Sardis, and the visitor was amazed to hear that the king not only planned the garden, but even planted some of the vegetation himself (*Oec.* 4: 21). In the Near East, images abound of the king watering small potted trees, or standing beside a date palm accompanied by genii bearing pollination equipment (Albenda 1974: 10; Stronach 1996: 177). Such depictions tend to be interpreted not as images of the king actually working in the garden, but symbolically as representing the link between him and the fertility of the land, and the general fruitfulness of his realm (Stronach 1996: 177).

The various different parks and gardens mentioned as belonging to Near Eastern rulers would presumably have been maintained by a staff, perhaps of slave status, leaving the king and his family free to perform relevant rituals and enjoy the

gardens. Certainly, the garden labourer in Egypt was known to have a hard life, "he works himself to death, more than all the other professions" notes a text from c. 1800 B.C. (Carroll 2003: 11; 80). In classical Greek times, it seems that most gardening was done by small landowners who worked their own plots; certainly, there are few references to actual gardeners in Greek sources (Carroll 2003: 85). Imperial Roman gardens on the other hand, had a large staff, with a *procurator* overseeing different workers like the *villicus*, the *supra hortus*, the *topiarius* and the *hortulanus* (Daremberg and Saglio 1899: 280-281; Grimal 1943). Surviving from 3rd century AD Egypt is a gardening agreement detailing the duties of the gardener: watering, maintaining irrigation channels, protecting the garden from birds and making baskets to transport earth (Parker 1940: 111). He also must submit his faeces for examination, an interesting method to control the pilfering of produce. It is not just the gardener who has his behaviour prescribed by the agreement, but also Talames, who owns the garden, must abide by certain conditions. When she visits the garden, she must be appropriately attired, with sun hat, work shoes, leather apron, a spear in case of hyenas, and a sword in case of a wolf (Parker 1940: 112).

It seems that some gardening roles held high status in Egypt: for example, garden designers and 'gardeners of the flower offerings for the god' were both important positions in society (Carroll 2003: 80). Greek gardeners were practically invisible until the Hellenistic period when some became renowned for the *Kepourika,* or treatises on gardens, that they produced (Thompson 1963: 5). These were invaluable then to the Romans, when gardening became an established profession, and famous *topiarii* were heralded in literature (Carroll 2003: 85-86). Yet true fame for gardeners in the West began much later in the 17th century. Specialists prescribed how best to design a formal garden, reminding the eager nobility "the walks should be raised on terraces and one should not neglect aviaries, fountains, water-works, canals and other such ornaments" (Thacker 1979: 143). Names like William Kent, Humprey Repton and Capability Brown attest to the fact that gardeners can become celebrities in their own era.

It seems therefore that elite gardens cannot exist without the work of a gardener, whether he be a labourer or a famed designer. Should the Minoan elite have created gardens, who would have looked after them? If they imported foreign plants, how would they have known how to care for them? The transfer of specialists with their esoteric knowledge was a feature of Bronze Age life (Kristiansen and Larson 2005: 1), and perhaps gardeners should be included in this category. The humans noted in frescoes do not appear to be gardening, which is

perhaps not surprising when it is considered that everyday activities are thought not to be painted on the walls of elite structures. However, if such an entity as a sacred garden did exist, as suggested by Schäfer for example, then such activities might be more likely to be shown in art. The Theran Saffron Gatherers of Xeste 3 are perhaps the most obviously involved in plant manipulation, picking crocuses (fig. 69), but whether they are tending cultivated plants or harvesting in the wild is a much debated issue, as discussed in chapter four. The Kneeling Female from Ayia Triadha might also be actively involved with plants (fig. 36), but whether this could be termed 'gardening' is debatable. Other frescoes do not show direct interaction that could be seen as tending to plants in any way. The stooping figures around the rim of the MM Phaistos fruitstand have been suggested to be picking flowers (Schiering 1999: 749) (fig. 40); whether this implies they are 'gardening' again is impossible to tell.

Frescoes may help identify gardeners in a more indirect way however. Evidence of gardening, i.e. work done in a garden or to plants, indicates the existence of somebody who tended the plants. The representations of plants in pots, such as at Amnisos, indicate that somebody was planting flowers and caring for them. The pruned palm trees in the various frescoes required a knowledgeable carer to do the pruning. Although there is no way to tell who these people were, or what their social status was, their very existence is certainly hinted at, and it would seem appropriate that in a stratified society there were 'gardeners' whose tasks were to look after the diverse flora which may have been a feature of elite life.

Turning to a slightly later date, Linear B texts provide information about numerous types of activities which people carried out for the palaces of the Late Bronze Age. Various agricultural workers have been recognised, such as woodcutters (*du-ru-to-mo*) and shepherds (*po-me*) (Ventris and Chadwick 1973: 155-194), but to date no specific term for gardener has been identified on the tablets. A possible clue may be found in the tablets Uf835 and V159 from Knossos and Na520 from Pylos. Palmer translated *pu$_2$-te-re ki-ti-je-si* from Pylos as *phuteres ktiensi*, "the planters are laying out the land" (Palmer 1963: 309), or as Ventris and Chadwick sum up "the gardeners plant" (1973: 270). The same word, *pu$_2$-te-re* is found in KN V159 (Palmer 1963: 449). *Pu-te* from the other Knossos example is thought to be an abbreviation of the same word (Ventris and Chadwick 1973: 270). So the existence of people who planted can at least be attested to, and perhaps future investigations will reveal more on the subject. Also relevant is that while there are tablets relating to land tenure, e.g. the E series at Pylos which includes possible estates of the king, and tablets listing orchards with olives, figs

and various seedlings (Ventris and Chadwick 1973: 232; 264-268; 272-274), no gardens have been listed anywhere. This could be due to the patchy nature of the surviving Linear B records, or that gardens were not included in any of the tax or redistribution systems and therefore not mentioned anywhere, rather than an absence of actual gardens.

Tools

Linked closely to gardeners are the tools which they use while tending to plants. There are two main problems in identifying gardening tools from any period: they are often indistinguishable from other generic tools or even weapons, and they probably were made of material which does not usually survive (wood or metal). Nevertheless, gardening equipment such as sickles, hoes and pruning knives has been recovered from Greece and the Roman world (Carroll 2003: 92-95). That this is only scratching the surface of the possible tools available is suggested by Cato's lists of proper equipment for different tasks. Managing a vineyard requires five rush-hooks, six tree-hooks, three pruning hooks, five axes and four wedges, two ploughs, ten forks, six spades, two four-toothed rakes, two manure hampers, one manure basket, forty grape knives, ten broom hooks, two braziers, two tongs and one poker (*Agr.* XI). Occasionally gardening tools appear in art also, such as mosaics from Roman north Africa, where rural scenes include pruning and other agrarian activities (e.g. Dunbabin 1978: figs. 99; 101).

Turning to Minoan material, gardening tools are certainly not high on the list of recovered remains. But numerous metal artefacts have been recovered from Bronze Age contexts; is it possible that somewhere amongst them gardening tools could be identified? Certainly general tools have been recognised in Aegean Bronze Age contexts: axes, picks, adzes, chisels, saws, knives and sickles are all catalogued (Branigan 1974: 22-29). Any of these could have been used in gardening, and some of the curved knives with concave cutting edges are perhaps reminiscent of pruning hooks (Branigan 1974: pl. 14). Some of the more solid saws also could have had a horticultural use. In Neopalatial times the large saws (1+ m. in length) are only found in palaces and at Ayia Triadha (Hakulin 2004: 13). Does this imply a link between cutting large trees and the elites of society that perhaps goes beyond construction and into the realm of control over the natural world? Yet there is nothing which could indicate that any of these tools are the remains of a Bronze Age gardener's tool bag, and so it seems the search for gardeners by their tools is unsuccessful.

5.5 Gardens and Botanical Imperialism

The link between gardens or plants and power has been constantly hovering in the background of this chapter, and is worth investigating further. It could be argued that as almost all evidence for gardens comes from elite-controlled sources, it is naturally those of the elite which are more visible. From Pliny the Younger writing about his villas, to the treatises on 18th century gardening techniques, the audience and author move in the higher ranks of society. Do the elite somehow have more invested in their gardens? Is it safe to suggest that it is only in these gardens of the elite that messages and symbolism can be found? This latter idea is not necessarily true; for example, every Trobriand male gardens, and his success at this sends messages to the community about his success as a man. Yet the men may only do this to a certain standard. Malinowski notes that only chiefs or those who tend chiefly gardens may possess a showy garden and may have the best garden in the region (Malinowski 1935: 60). So in this society where every man gardens, to be the most successful gardener remains the preserve of the elite. While every garden does carry a message, it may be true to say that for the elite the message becomes amplified and its maintenance more important as preservation of status is essential.

Plants as spoils of conquest

The practice of plants travelling the globe as booty of conquered countries is part and parcel of empire and dominion; it happened in Assyria, in Rome, in Egypt, and later in the British Empire, for example. It seems that wherever there are voyages to distant lands, new plants always make their way back to the home country. One reason for this is that plundering a nation's plant resources can be equally rewarding for the conqueror and damaging for the victim. An infamous example is the smuggling of cinchona bark, famed for its anti-malarial properties, out of South America to the Dutch East Indies to provide a ready source of quinine for the rubber traders there (Musgrave and Musgrave 2000: 155). The cinchona industry in South America never recovered from this setback, while the Dutch developed a monopoly on quinine, thus illustrating that to rely no longer on foreign sources for valued plants is a huge economic boon, and conversely the loss of trade in any commodity can be potentially disastrous. In ancient times, perhaps the most famous example is the expedition sent by Queen Hatshepsut to the land of Punt, which is recorded on her tomb at Deir el-Bahari (fig.33). The expedition returned with spoils including tusks, skins, and *anty* trees to cultivate. The exact identity of *anty* is still uncertain, but it was definitely an incense-producing tree. Scholarship currently tends toward myrrh (*Commiphora* sp.) rather than frankincense (*Boswellia frereana*) (Wilkinson 1998: 83-85). Either way, for the

trees to grow in Egypt and so reduce reliance on foreign trade for such a precious commodity would have been of great economic benefit.

Not all foreign species which are brought home after conquest or travel are necessarily of the types which could be termed 'economically important' though. In fact, it seems that a key hallmark of gardens at centres of power is the gathering together of many foreign and native species of plant in one location, regardless of their potential uses. Tiglath Pileser I, already mentioned above for his plant collecting, included cedars and box among the species he brought back from campaigns (Berrall 1978: 28). Kubilai Khan also had a penchant for collecting trees, Marco Polo wrote, and "whenever the Great Khan hears tell of a particularly fine tree he has it pulled up, roots and all and with a quantity of earth, and transported to his mound by elephants." (Thacker 1979: 49). The great rulers of the Aztec kingdom had large gardens, like that at Tetzcotzinco:

> "These parks and gardens were adorned with rich and sumptuously ornamented *alcázars* with their fountains, their irrigation channels, their canals, their lakes and their bathing-places and wonderful mazes, where he had had a great variety of flowers planted and trees of all kinds, foreign and brought from distant parts" (Soustelle 1961: 125).

The botanical reliefs of Tuthmoses III at Karnak show the plants "that his Majesty has found in the land of Retenu", i.e. Syria (Schwaller de Lubicz 1999: 636) (fig. 32). Kew Gardens, perhaps the most famous centre for plant study in the world, was established to display the fruits of botanical imperialism, a garden replete with plants from all the colonies over which George III was ruler (Musgrave and Musgrave 2000: 149). Needless to say, transporting plants, trees and seeds successfully is not an easy task when the journey can be many months long, and involves crossing oceans. On board ship, they suffer from changes in temperature, and lack of fresh water, and even the occasional mutiny, like Captain Bligh and his breadfruits. Yet throughout time rulers have gone to the trouble to surround themselves with plants (and animals) from distant countries. The reasons for this reach beyond profit and into the realm of prestige.

Plants as prestige artefacts

As plant maintenance can be very expensive, both in terms of time and money, on a purely practical level it is usually only those with plenty of both who can engage in seriously extravagant gardening. Economic wealth allows both the payment of others to do the hard work, as well as the acquisition of different plants, through purchase or expeditions of exploration and conquest. While the poor may need to use their gardens for food plants, the rich can blatantly allow acres to go without

'productive' plants, and so reinforce the gap between them and the masses outside the garden wall. As Riley has observed, "playful gardens are power in its most capricious form" (1990: 62). Stocking a garden with plants which come from other lands adds another layer of meaning to the place. The acquisition of wonders from distant locations has been shown to be an effective means of social differentiation (Helms 1988: 11-13). Those who have the means (material wealth and/or power to command) to acquire the fruits of overseas expeditions are demonstrating these traits by creating a garden of marvels. A key element in Near Eastern gardens was the enormous range of plants and animals with which they were stocked, enhancing the wondrous nature of an already impressive project. It should be noted that it was not just visually impressive or decorative plants which were popular, but useful ones which provided incense, or fruits, or even fine woods were valued as garden species too. Moreover, such exotics are not just curiosities but "repositories of power", symbols of "distant regions known and controlled by the lords of the realm" (Helms 1988: 164-165). Furthermore, if the plant is one which holds a special status in that distant society from whence it came, knowledge and control over the plant may further add to prestige of the new owner.

It is suggested therefore that in the Bronze Age plants may well have moved across the Mediterranean, as spoils of war, as gifts between rulers, or even as acts of botanical piracy.[63] The role of travel and long-distance connections at this time has recently been highlighted by Kristiansen and Larsen (2005), and such contacts should not be a surprise. Of the 383 plant representations on the walls at Karnak, 64 are foreign plants, apparently brought to Egypt by Thutmoses III (Bianchi 1997: 87, n.4). Apart from economic value, for Minoans to successfully cultivate plants brought from overseas could possibly enhance their status in their own society. The very strangeness of objects adds to their potency, as does the sheer distance which they must travel, as well any magical efficacy (Helms 1988: 118-119). That water lilies, for example, had special roles in Egyptian myths and society, as well as coming across the sea from Egypt, a land known in the Aegean for its other valuable exotic goods, would add to the prestige of those who owned or controlled such things. Knowledge as a base for social differentiation must not be underestimated, and those with knowledge of foreign places and exotic, perhaps magical, plants may have been seen to have a special link with the hidden riches of the earth (Helms 1988: 122).

Of course, botanical traffic would not all have been one-way, and it is likely that

[63] This idea was introduced in chapter two, where any possible evidence for travelling plants was considered.

plants from the Aegean found their way further afield also. The artistic representations of Aegean flora which appear in both the Near East and Egypt may be an indication of such travelling plants. The irises and crocuses on the floor of Tel Kabri are a case in point: do they indicate that actual plants travelled across to Israel? And what about lilies and olives appearing at Tell el-Dab'a? Again, for the elite, knowledge of such foreign plants may have played a role in both creating and maintaining status. Yet just because frescoes of foreign plants are found, it does not necessarily follow that the plants themselves were seen in the palace gardens or decorating their interiors. The possibility of a shared repertoire of motifs among elite centres in the eastern Mediterranean was raised in chapter two. What is interesting to note here is the role of plants among this repertoire. Considering the prestige granted by actual plants and gardens, it is hardly surprising that representations of plants should also be associated with centres of power. From the elaborate reliefs of Assyrian palaces to the landscape paintings commissioned by landed gentry in 18th century England, plant images reaffirmed what was already evident from the real gardens - the right of some people to hold authority over others as they perhaps held it over nature. Even if a ruler in Tel Kabri did not grow irises, by decorating floors or walls with the motif, knowledge of the foreign plant, and by implication, of foreign lands and customs, was demonstrated, and links with other Mediterranean elite was signalled.

Vistas, an audience, and total landscape.

Perhaps the most important thing for a garden is an audience. Gardens are meant to be acknowledged and experienced, be it from within or without the boundary. Specific vistas are often planned, the viewer's eye led along a particular path by a row of trees or an avenue fading into the distance. Formal gardens have been called "an exercise in optics" where the position of every plant, tree or water feature is carefully calculated (Leone 1984: 31). An essential part this calculation is some form of man-made structure, often to provide shelter (from sun or rain), as well as providing a private spot in which to rest and view the garden. Smaller gardens, such as those found at Pompeii, often have a shaded peristyle area around the edge or along one side, affording access to and views of the garden. Similar porticoes (*bit hilani)* were part of Near Eastern gardens (Albenda 1976). In ancient Egypt little kiosks can be seen in tomb paintings, probably made from wood, reeds or papyrus, situated to overlook the pools. All such structures were usually situated at carefully chosen places allowing for contemplation of the garden, accompanied perhaps by an awareness of the magnificence of the owner. In the big houses of the 17th and 18th centuries, the first floor galleries became important for the views they allowed onto the surrounding formal gardens;

parterres and beds, viewed from on high, in the centre of authority, underline the sense of control over nature that was their intended message (Thacker 1979: 144: Strong 2000b: 144) (fig. 206). Thus the garden could be easily surveyed spreading downwards towards the countryside, and the house could likewise be seen as the focus of the garden. The terracing of gardens surrounding funerary temples in Egypt likewise served to emphasise who was in control, with precincts such as Hatshepsut's at Thebes rising several tiers up into the hills (Wilkinson 1998: 9).

While no Minoan pagodas or kiosks have been recovered (and would surely have been erected in parks rather than courtyard gardens anyway), the locations suggested by various scholars for Minoan gardens adhere to the principle of intervisibility between dominant structure and garden space. With their relatively small scale and setting within a built area, it would be impossible not to be aware of any such garden from the overlooking portico, or nearby rooms. Interestingly though, the gardens tended to be located in the innermost areas of the complexes, hence admittance would have been closely controlled. It is also interesting to consider the link to the world beyond the garden and the architectural complexes. Looking at the locations suggested for Minoan gardens, they cannot be said to be linked by a common aspect, as might be conceivable if the locations of such places were prescribed by certain rituals or aligned astronomically. That suggested for Knossos looks to the southeast, as does one of the Phaistos examples, whereas the other Phaistos garden faces north, similar to the proposed locations at Mallia and possibly Ayia Triadha. If a garden existed outside the portico of the Little Palace, it would have faced east, and if La Rosa's suggestion of a garden south of the Piazzale dei Saccelli is taken into account, that would provide a south-facing one. Therefore, if gardens did exist in the above locations, the Minoans appear not to have been concerned with ensuring a similar aspect for them all.

An alternative is that they were located in places with clear views of the surrounding land. Outside the Hall of Double Axes at Knossos, depending on how high a wall enclosed the space, the view would have continued beyond the garden and across to the east of the valley (fig. 173). Similarly at Phaistos, a viewer walking in a garden located at the southeast side of the palace would have seen the Mesara landscape unfolding beneath them (fig. 175). The point where garden ends and nature beyond the boundary begins becomes blurred. In fact, this was the aim of Capability Brown's 18th century "total landscape", with lakes, forests and swathes of grass leading into one another in a fashion almost indistinguishable from the land beyond the boundary (van Zuylen 1995: 88-92). Could this have been a deliberate use by Minoan elite to make a statement about

their understanding or control of the natural world? The garden can be seen as part of the grand scheme of nature, and all of nature can be considered fit for a garden. This is another area worth further exploration in the future.

5.6 Final comments

The aim of this chapter was to explore in depth the case for Minoan gardens, based on more than just hunches about certain locations, as previous writers appear to have done. The traditional archaeological methods for discovering gardens have not had success on Crete, although perhaps future excavation may be rewarded. It is also important to understand why it would be surprising if Minoan elite did not have gardens. Examining the history of gardens in Egypt, the Near East and Western Europe helps to underline the extent to which gardens have always accompanied elite lifestyles, even if the meanings assigned to plants and features within them changes over time.

Although specific locations within palaces have been suggested to be gardens, nothing concrete has so far been discovered to support this claim. On the other hand, there is plentiful evidence for flower pots, and it seems more likely that portico locations may have contained numerous potted plants of differing shapes and sizes than actual beds of soil. Evidence for plant cuttings into bedrock should be further investigated to see if they appear in other Minoan locations. One option worth considering is whether the Minoans had park-like gardens outside architectural complexes. Were there certain stretches of land where plants, and even animals, were maintained? This is what Morgan suggested for the Nilotic fresco (Morgan 1988: 39-40), but could other scenes like the Monkeys and Birds from House of the Frescoes also perhaps have a basis in a reality of tended parkland? Could such areas even have been seen as sacred gardens, an issue briefly touched upon by Schäfer in relation to the Amnisos fresco? Certainly there would not have been any problem with watering plants in most Minoan structures and the related issue of cultivating aquatic plants is a new idea, considered here for the first time. Iconography does show water lilies, but whether these were actually grown by Minoans, or that only the imagery was transferred from Egypt remains uncertain. Sadly Minoan gardeners have remained frustratingly elusive. Something that emerges as equally intriguing in the course of this work is that many excavators have chosen to see gardens as an integral part of a Minoan structure, based on very little actual proof, but rather perhaps on the long tradition of a link between pleasure gardens and elite lifestyles.

The final section of this chapter took a step back from searching for proof and considered the roles gardens might play in the life of a Bronze Age elite. In the ancient world gardens were undoubtedly associated with centres of socio-economic power, and so would be expected at Cretan palatial sites, if they were going to appear anywhere on the island. Indeed, for Goody, the growth and use of cultivated flowers is part of the "culture of luxury" developed at urban centres (Goody 1993: 24). Plants may well have been moving around the Mediterranean as one of these luxury commodities. The fact that they can be more than just food or decoration but bearers of messages about conquest, power and status is crucial. Controlling foreign plants can be as potent a sign of hierarchy as controlling foreign people. In cases where plants themselves did not travel to new places, perhaps merely to depict them was an indication of being party to knowledge of foreign places and peoples, and emulating the practice of gardening and its elite connotations. Maintaining a garden also may have a link with the concept of looking after part of nature, and therefore justifying being in a position of control over other people too. The possibility of key visual links with the landscape beyond the garden wall was briefly raised and is also worthy of further exploration.

Chapter 6. The Multi-Sensory Powers of Flowers

> "First the use of the art of perfumes to enhance the gastronomic experience. Every dish will thus be preceded by a perfume attuned to it, which will be dispelled from the table by electric fans. Next the use in measured doses of poetry and music as unexpected ingredients to accentuate with their sensual intensity the flavours of a given dish. The second course consists of four parts: on a plate are served one quarter of a fennel bulb, an olive, a candied fruit and a tactile device. The diner eats the olive, then the candied fruit, then the fennel. Contemporaneously, he delicately passes the tips of the index and middle fingers of his left hand over the rectangular device, made of a swatch of red damask, a little square of black velvet and a tiny piece of sandpaper. From some carefully hidden melodious source comes the sound of part of a Wagnerian opera, and, simultaneously, the nimblest and most graceful of the waiters sprays the air with perfume." (Marinetti 1989: 77).

The fourth course served at the First Futurist Dinner held in Turin in 1931, as described above, was certainly not recommended for the hungry. "Aerofood, tactile, with sounds and smells", as described above, must have been a surprise to those who turned up to dine unaware of the Futurist concept of eating using all five senses (Marinetti 1989: 77). If the diners enjoyed the experience, they could have perhaps moved on to experiment with Marinetti's "Extremist Banquet", where nothing was eaten but diners sat at table for two days being tantalised with a variety of smells (Marinetti 1989: 116). Although the Futurists were being deliberately provocative, and saw food as a raw material for art, they exploited the whole of the human sensorium.[64] Archaeologists however have been slower to realise that humans are sensual beings, and that the world is perceived not just through the eyes but the whole of the body and its senses. The influence of phenomenological thinking has created a body of work based around "experiencing", especially amongst British prehistorians (e.g. Tilley 2004). Other recent work has incorporated sensory scholarship as developed in the realms of social studies and anthropology; for example Hamilakis has utilised a corporeal approach to explore new ways of understanding Minoan society (2002b; 1999; 1998). Even in this work though, the actual sensual impact of Minoan artefacts is not considered, despite the fact that the world is apprehended through the senses and thus every encounter leaves a somatic memory (Stewart 2005: 61). This final chapter explores a different way to approach the Minoan use of flowers and floral motifs, turning from the traditional ocular-centric analysis of Bronze Age art to considering its possible effect on the other senses.

[64] Sensorium is the term given to the entire perceptual apparatus as an operational construct.

6.1 Kamares Ware with Relief Flowers

The material

The abundant floral imagery on Protopalatial Kamares ceramics includes a particularly interesting category of vessels which have relief attachments inspired by the plant world: petals, rosettes, and even whole flowers appear on a number of pots (Table 6.1). Relief decoration on ceramics occurs around the Mediterranean during the Neolithic and Bronze Age, ranging from protruding bumps, to humans and animals, to miniature vessels attached to larger ones (Foster 1982: 142). Flowers as plastic decoration however seem few and far between, except on Crete, and even there they are restricted primarily to MM II-MM III (c.1800-1600 BC). Little has been written about these vessels, yet it is argued here that potentially they hold clues to a Minoan multisensory experience.

These floral relief attachments come in a variety of forms, most impressively as three-dimensional white flowers, but also as flatter rosettes, and moulded petals. The well-known Phaistos Krater (1)[65] is perhaps the most spectacular example of floral attachments (fig. 207). Standing almost half a metre tall, decorated with a chequerboard pattern on the bowl, and so-called "coral" around the pedestal, this vessel displays seven relief flowers. Three sprout from the pedestal while another four are attached to the bowl. The flowers themselves are white, with eight or nine pointed petals with incised grooves, surrounding an orangey centre. The interior was left plain, while around the base is a band of white petals, similar to those of the flowers. Levi dated this vessel to his Ib period, equivalent to MM IIa. A jug (2) painted in an identical style is thought to make up a set with the krater (fig. 208), and although no relief elements remain attached, Levi believed there once had been an inflorescence at the vessel's neck (Levi 1976: 101).

Although the krater is the most famous example of relief flowers, there are a number of other vessels with similar decoration. From the same site and period as the krater comes a globular vase (3) which displayed the same style of flower (fig. 209). Found in fragments, there were at least four white flowers with red centres attached to the vessel's shoulder, just above a ledge pierced with vertical holes which also runs around the belly. A more recently discovered piece comes from Ayia Triadha (fig. 210). This pitharaki (25) has twelve vertical ribs on its exterior, with a flower atop each one (only six flowers survive, but it is assumed all twelve were alike). Again the flowers are white, with a red centre, and have been compared by the excavators to examples on a jug from Phaistos (La Rosa: 1994-1996: 329). This Phaistian jug (4), discovered by Pernier, has a spout which has been given ears to look like an animal. Twin pedestals rise from its shoulders, each

[65] Numbers in brackets beside the vessels refer to their catalogue number on Table 6.1.

one topped with a white flower (fig. 211). Another vessel from Ayia Triadha (26), a 6-handled pithoid jar, apparently also was decorated with mould-made flowers (French 1993-1994: 73). A rim/handle join from an open vessel found at Kommos again has the same type of flower attachment (18) (fig. 212). Two fragments of white petals from Quartier Mu at Mallia show that similar relief flowers could be found at this site too (22) (Detournay *et al.* 1980: fig. 185). A white relief flower with red centre was recovered by Evans at Knossos (13), who believed it to be an attachment for a vessel (PM IV.1: 124-125) (fig 213). An interesting piece from Phaistos looks like a stopper for a jug or jar (5), with several large petals flaring out from the top, as well as a collar of small white petals (Levi 1976: fig. 586). A one-handled cup from Anemospilia (27) is reported to display relief floral decoration, but if this is indeed the case, the flower is unlike any of these others (Sakellarakis and Sapouna-Sakellaraki 1997: fig. 547). Finally, an exuberant version of this type of vessel has been found in Egypt, at Qubbet el-Hawa (30) (fig. 214). Five petals flank the mouth, forming a flower, and five more flowers are attached around the vessel's shoulder, all of which are white with incised grooves on the petals. Dating the vessel accurately is difficult due its discovery in a disturbed tomb context, and initially it was thought to be a local copy of a Middle Minoan vase (Kemp and Merrillees 1980: 215). More recently, it has been seen as belonging to the East Cretan Alternating Floral Style and probably made at Palaikastro (Floyd 1997: 314).

Apart from these flamboyant white flowers, sprouting off the vessels to which they are attached, mention must also be made of a subtler type of relief flower, which hugs closer to the vessel's surface. A bridge-spouted jar from Mallia (23), Quartier Gamma, features low relief flowers with rounded petals on the sides, all covered in a lustrous black coating (fig. 215). A moulded rosette (24) was found in Quartier Mu (Detournay *et al.* 1980: fig. 184), perhaps for application to a vessel in a similar fashion to the previous example. Kommos also delivered two relief rosette-type flowers, unattached again, but presumably for the same purpose (19; 21) (Betancourt 1990: pl. 72; fig. 54). A large bridge-spouted jar from Phaistos features two applied rosettes, white with red centres, on either side of the handle above an applied agrimi (6) (Levi 1976: pl. xxviii). Another relief "marguerite" came from the Grande Frana of the same palace (7) (Levi 1976: fig. 544). Also similar are the applied flowers on the sizeable jar from Anemospilia (28), where they are attached to the rim, above a painted bull in a floral setting (Sakellarakis and Sapouna-Sakellaraki 1997: 548-562). The earliest example of a relief flower can be included in this category also, a MM I bowl from Sphoungaras in east Crete (29). The bowl has a central pedestal with a white flower moulded on top (Foster

1982: 98); once filled with liquid, the impression would be of a blossom floating on the surface.

A third class of relief floral decoration is the addition of petals, usually around a vessel's rim or base. From the same context as the Phaistos krater comes a fruitstand (8) with a white petal band on the rim; the petals again feature incised lines running up their middles (fig. 216). Another Phaistos example is a spouted basin (9), decorated as usual with a variety of Kamares loops and spirals, and a rim of white petals (fig. 217). A more unusual shape is the pedestal (10), dated to Levi's phase II, or MM IIb, which includes three petal bands: one around the rim, one around the base, and a third at the point where the bell-shaped top section joins the narrower stem (fig. 218). A MM IIIa-b basin from the ramp area at Phaistos continues the petal rim tradition (11), and this time includes interior decoration of a thin branch (Levi 1976: pl. 184e). As its centre was missing, it is possible this vessel was also on a pedestal. Also in this category is the piriform rhyton (12), which has a flower-shaped mouth formed by ten white pointed petals (fig. 219). Instead of the more customary groove in the centre of the petal, these ones have a relief spiral, and "coral" features on the body. Fragments of white petal bands have been found at Kommos too (20) (Betancourt 1990: pl. 72; fig. 54). Knossos provides further examples of this category of material, found in the Koulouras of the West Court. Evans illustrates a fragment of a rim with handle attached (14) (fig. 213) and MacGillivray catalogues other petal fragments from the same context (15; 16) (MacGillivray 1998: 148; pls. 63, 91). Interestingly, the petals of 15 are very similar to those on the Phaistos rhyton, pointed and with circles on them. Also to be seen in his Pl. 63 is a larger fragment of petal rim, not mentioned in the text (17). This one has squarer petals, more akin to those on the Phaistos pedestal.

Possible function of the vessels

Yet what is the purpose of decorating vessels in such a manner? To do so does not add to their functional value - no matter how many flowers or petals are attached, it still remains a jug for pouring liquids, for example. Indeed the more flowers that are attached, the harder it may be to actually use the vessel without breaking bits off it. One ethnographically documented reason for floral decoration or even plant-shaped vessels is to serve as indicators of their contents. For example, the Pueblo Indians of America have a range of vessels which take the form of the spiky fruit capsule of the datura, a plant used by a wide range of societies in both medicine and in magico-religious rites (fig. 220). The San Pedro cactus (*Trichocereus pachanoi)* is depicted on Chavín vessels which may have held the hallucinogenic

beverage made from it (fig. 221) (Sharon and Donnan 1977). More modern examples include milk jugs shaped like cows or squeezy plastic lemons filled with juice. Do the white flowers then signpost in some way the contents of the vessels? It is possible that the Minoans added floral extracts to beverages to enhance their taste or effects. Many societies add plant extracts technically known as admixtures to their intoxicant of choice to further heighten its effects. When Rutter wondered what could have been contained in the small bowls which are part of 'sets' of tableware from Kommos, his suggestion was that they held some kind of additive for the beverage, akin to sugar bowls in a modern tea-set (Rutter 2004: 78). That the additive may be derived from flowers did not occur to him, but precise evidence for what exactly was drunk in the Bronze Age, including floral alkaloids, may emerge from future residue analysis, although currently this process remains relatively speculative.

If the flower could be identified as a particular species known to hold flavouring or stimulating powers, this may support the hypothesis that it represents an admixture. They do display a uniformity of shape, with white, generally pointed petals, growing around a red or orange centre. Levi tended towards naming all the flowers he noted on Kamares vessels "marguerites" (e.g. 1976: 571), a name covering many species of the daisy family. Over time however, it has become another Minoan factoid that these white flowers are lilies, based mainly on recognising white lilies in wall paintings such as at Amnisos. Yet this is an interpretation with which few, if any, botanists would agree. Lilies always have six petals, and do not show the lines in the middle of the petals which are a deliberate feature of the relief flowers. Also, quite simply, they do not have the form of a lily, being much less trumpet-shaped. Considering the level of Minoan ceramic technology, it seems likely that had potters wished to create a recognisable relief lily, it would not have been beyond them. In fact, relief lilies have been found on LM Ia-b piriform jars at Mochlos and Gournia, where they are moulded exactly like three-dimensional versions of those in wall-paintings or painted on the Knossos lily vases (fig. 222) (Brogan 2004; Boyd-Hawes *et al.* 1908: 35). It is possible that the "coral" painted on some of the Kamares vessels could, in fact, be intended to portray thorny branches of a plant, but no corresponding real plant has been identified. Furthermore, the fact that the flowers are white may not be in imitation of a real plant, but merely the result of the potter working within the Kamares tradition, where black, white, orange and red constitute the palette. Perhaps no particular species is intended at all, leading to a suggestion that recognition of these flowers may not have been necessary for their message to be understood, or for them to function successfully.

Stepping back briefly, it is important to note that there is little doubt that all these elaborate vessels were linked to the Protopalatial elite, as items of prestige. It has been suggested that Kamares ware had a role to play in ceremonial or feasting events, which would have served to legitimate the power of these elites (Day and Wilson 2002: 159-160; 1998: 356). To command the resources to organise a feast, to provide meat and drink, as well as the elaborate vessels to consume or serve from, is a way of underlining one's place in the hierarchy of a society. Hamilakis has suggested that Neopalatial Crete was a society based on factions, whose so-called "material culture wars" led to elaborate feasting ceremonies (Hamilakis 2002a). That feasting happened in earlier periods on Crete seems quite probable too, as exemplified by the deposits of drinking and pouring vessels at Knossos and Kommos (Day and Wilson 2004; 2002; 1998: 350-351; Rutter 2004). It can therefore be assumed that the vessels discussed above would not have been for daily use, but reserved for special occasions such as these gatherings. Their link with liquids is indisputable; there are a number of jugs, a globular vessel, a rhyton, a large krater, and the Kommos and Knossos sherds also seem to come from similar open vessels or jugs. Levi wondered if the pedestalled krater performed a similar function to those of later Greek antiquity - namely for holding wine which was then distributed to the banqueters via a jug (Levi 1976: 101). The matching jug found with the krater supports the idea of using the vessels as a set. Other vessels, such as the fruitstand do not seem suited to holding liquids, but none the less could have played an equally important role at such gatherings by holding other consumables, or even items for display (Day 2006: 35, n.4).

Floral memories

Apart from the material consumed at such events however, the memory created at them is also essential in binding people together into social groups, or forging what Hamilakis terms a "corporate identity" (Hamilakis 2002b: 186). This bodily memory of eating, drinking, or consuming psychoactive substances can be triggered again at later dates by the same taste or smell, thus bringing to mind a whole range of associations of people and actions from the original event. This, of course, is what Proust was writing about when his narrator raised to his lips a spoonful of tea in which he had soaked a morsel of madeleine, which then brought a multitude of memories flooding back. Such sensory experiences are a powerful part of human life, and often when nothing material remains of the actual experience, "the smell and taste of things remain poised for a long time, like souls, ready to remind us, waiting and hoping for their moment, amid the ruins of all the rest." (Proust 1913: 58).

This quote underlines something that tends to be overshadowed in Western studies on perception and the senses - that taste and smell, and indeed touch and sound, can be equally as powerful as sight, the sense that has traditionally been privileged in such works and indeed in archaeology. Studies on how objects feel in the hand, or the way sound might have carried in an ancient structure, for example, have remained relatively marginalised until recently, especially in relation to Aegean prehistory.[66] Yet it is a fact that different societies have different culturally-conditioned conceptions of the senses, and not all cultures even recognise the same number of them or accord the same priority to each one (e.g. Classen 1993). This domination of vision arises from the Enlightenment concept of understanding the world scientifically via the eye and brain, by what is seen and rationalised, rather than by what is sensed. To seek to understand a culture only through the visual effects of its material remains, as opposed to considering the effects on the complete sensorium, is to close off an important route to accessing cultural values.

Two societies where smell was an extremely important sense were ancient Egypt and the Aztecs. The Aztec upper classes surrounded themselves with both real flowers, and vessels decorated with floral motifs, which triggered pleasant associations with smell in the minds of the users (Houston and Taube 2000: 265). Buildings had flowery emblems carved on to them, which were considered to exude an exquisite aroma (Houston and Taube 2000: 265). A complex system of spirituality centred on metaphors of flowers, with Nahuatl poets known as "singers of flowers" (Hill 1992: 123). The gods and the dead were believed to be nourished with scents, of cooked food, of incense and of offerings of flowers, a practice still carried out today in cemeteries and churches. The Aztecs even had two gods of flowers, Xochiquetzal, and her twin brother Xochipilli. Pharaonic Egypt was a major importer of scented materials, and perfume was used not just as a personal adornment, but was was important in festivals, rituals, banquets and death (Meskell and Joyce 2003: 56). It was also associated with the gods, who gave off a divine fragrance (Meskell and Joyce 2003: 56), an idea replicated in the early Christian concept of the odour of sanctity associated with the Holy Spirit and those touched by it, especially numerous saints (Classen 1998: 36-37). Similarly, the gods of classical Greece were also considered fragrant and dressed in scented cloth.

Of particular interest in relation to the Minoan vessels discussed above is that some societies use symbols to represent these other sensory experiences in their

[66] Some examples of works on an archaeology of the senses include MacGregor 1999; Jones and Hayden (eds.) 1998; Hamilakis 2002c.

art. A study of sensory perception in Mesoamerica has focused on the symbol comprised of two symmetrical outward-curving elements which indicates "odour" (Houston and Taube 2000). It can be found associated with Mayan depictions of flowers, as well as hovering over the mouth of vessels containing fragrant beverages (fig. 223). Egyptian art may also subscribe to this practice of representing that which cannot be perceived by the eye in the real world. Numerous images of Egyptians at banquets and other functions shows them with an incense cone on top of their heads (fig. 224). Traditionally this has been interpreted as a mixture of perfume and fat, which was worn on the wigs, and as it melted, released pleasant scents into the air. Apart from the fact that melting fat running down one's head would perhaps not have been conducive to enjoying the banquet, no cones have been found in archaeological contexts (Shaw and Nicholson 1995: 140). Instead, it has been suggested that the images of cones are symbols indicating that the wigs were scented (Shaw and Nicholson 1995: 140-141). More generally, the cones may stand for the concept of aroma (Meskell and Joyce 2003: 56), serving as a way of depicting something which otherwise would be impossible to represent. Traces of such practice can occasionally be noted in the modern West, such as in cartoons where wavy lines are the traditional way of denoting a bad smell (fig. 225). In societies where smell plays a key role, it should not be a surprise to discover that ways of illustrating such an important sense were invented. That the dominant sensory medium can vary widely between cultures is now accepted, yet within Aegean prehistory there has been little recognition of this fact and the potential for exploring a Minoan "sensescape"[67] remains untapped.

Focusing on the phenomenon of the petal rims provides further clues in this direction. In effect, the addition of a petal rim turns a vessel into a symbolic flower, and whatever was contained within the vessel's bowl is seen as emerging from a flower. Other vessels may be participating in this symbolic transformation of ceramic into plant by the addition of painted triangles or loops on the rim in place of plastic attachments. This can be noted on the Phaistos krater (fig. 207), but is also found on a number of other Kamares vessels, e.g F6288 (Levi 1976: pl. XXa). Some cups have painted petals spreading out from their bases (figs. 203; 226); this looks unspectacular until the vessel is raised to the drinker's lips, presenting an impression to others of drinking out of a flower. Indeed, in contemporary Egypt, vessels which deliberately take floral form can be found. Lotiform chalices were used as cult vessels and for elite drinking cups, especially during the 18th Dynasty (Tait 1963: 96-99). To the onlookers, "it was not merely decorated with lotus petals ... it was truly the *Caerulea*, no withering flower but an

[67] This term is borrowed from Howes 2005.

eternal flower in gold or glaze ... the bowl on a stand had been transformed into a bloom on its stem." (Tait 1963: 99). Looking beyond ceramics on Crete, the LM I stone vases known as 'blossom bowls' also take the form of an overgrown flower (fig. 144). It is even possible to say that the petals have a similar appearance to those already noted on the Kamares flowers - pointed ends, and a groove up the middle.

If these elaborate Kamares vessels were intended for use at feasting events, their impact could have been much more subtle than has so far been considered. The idea of relief flowers as markers of contents was discussed above, and is indeed a possibility to bear in mind, although as yet there is no satisfactory candidate for which flower could be represented. The strong visual impact of the ceramics should not be overlooked either, especially when compared to the plainer ware which may have been used by some participants at feasts or other gatherings. Using the idea of synaesthesia, the ceramic flowers and petals become sensory links, stimulating not just the eye but also the nose, and possibility the closely related sense of taste too. In this case, it is perhaps not so important if a real species is depicted or not, as long as the idea of 'flower' and the associated olfactory stimulus is portrayed. Certainly, there is no shortage of texts from later classical times, telling of banquets and feasts where perfumes, in the form of garlands for diners' heads, incense burning, and unguents for the skin, played an important part in the event (Classen *et al.* 1994: 13-50). That the whole sensorium was stimulated in a Bronze Age gathering is equally likely. Indeed some of the perfumed oils listed in Linear B may have been for use at feasts. Furthermore, even the sense of touch could be appealed to by the relief vessels, their petals and flowers reaching out to demand tactile contact, which then becomes imprinted on the bodily memory.

To see such a vessel as the Phaistos krater, and perhaps for the contents of it (be it liquid, food or even smoke) to emit an odour as real flowers release scents, would be a powerful multi-sensory experience. Add to this the effect of whatever was consumed from the vessel, with potential for altering states of consciousness, and it becomes possible that such vessels with flowers or petals on them were potent mnemonic links, both of the act of consuming and of the accompanying social interaction at the event. The placing of flowers on these vessels perhaps brought expectations and associations of scent to the gathering and may have indicated contents of the vessels. Recollections of the feast would later be stimulated by smelling similar aromas or indeed visually encountering this flower. One sherd is worth mentioning in this context: the 'Tarzan' fragment from Akrotiri shows a

male face close to a flower, perhaps even smelling it (fig. 43). Later Mycenaean pottery features animals apparently smelling flowers, and a seal from Myrsinochorion shows a woman perhaps smelling some lilies before an altar (fig. 227). The meaning of these depictions has never been investigated. Interestingly, smell has been noted to promote a sense of merging with both the surrounding environment and with one's fellow beings (Classen 1998: 58), and to undergo some form of communal olfactory stimulation would serve to bring a group closer together. At a time when elite groups on Crete were perhaps competing with each other, any means of forming close bonds between members of social groups would have been valuable. Furthermore, it is possible too that in Minoan culture smell was not the "sensory black sheep" it is in the modern West (Classen 1993: 16), but an important way of perceiving and making sense of the world.

6.2 The Room of the Lilies, Akrotiri, Thera.

The room

Turning from a study of objects to a study of a space provides an opportunity to consider the multisensory effects of a particular environment. Room Delta 2 from Akrotiri, the room of the Spring Fresco, is the focus of this section, primarily because of its floral content, but also because the painting was found intact on the walls, meaning that its original composition is known. Delta 2 is a ground floor room within the Delta complex, accessed via the room or courtyard to its east. The fresco forms a continuous scene around three sides of the room, running below a horizontal shelf. These walls are actually twice the thickness of other walls in the complex, for reasons unknown (Doumas 1992: 99). The remaining east wall contains a doorway and double window, and a small opening was also cut in the north wall into a 'cupboard'. Red lilies spring from multicoloured rocks, while swallows dip and dive above them (fig. 23). Unusually, the fresco begins at ground level as opposed to in a central register (Doumas 1992: 100). Marinatos, on uncovering the paintings in the 1970s, found it hard to see the room having a profane use. Indeed, even the name Spring Fresco was based on this belief. He wrote

> "The Lilies fresco was almost certainly the expression and the environment of the Spring form of the Great Nature Goddess. It is the great moment, when Nature comes back to life after the lethargic sleep of the winter. The rocks are covered with moss, the lilies have sprouted from their buds, and the swallows are mating." (Thera IV: 49).

This tendency to see the room as having a sacred or ritual function has continued over the years. Nanno Marinatos has suggested that the fresco was linked to the

coming of spring, and served as a backdrop for rituals performed to ensure the regeneration of nature (Marinatos 1984b: 94). Another hypothesis is that the room was the setting for an epiphanic experience (Foster 1995). Stürmer proposed that this room, along with room 14 at Ayia Triadha and room 1 of the House of the Ladies, was where a priestess prepared for cult activity (Stürmer 2001). The only dissenting voice has pointed out that none of the objects found in Delta 2 were of an especially religious nature, concluding it "is best understood as a safe and aesthetically pleasing environment for an important person." (Hollinshead 1989: 339).

Experiencing Delta 2

All these analyses of the room are based primarily on visual interpretation of the fresco. Yet to gain a greater understanding of the room's possibilities, the potential for a variety of somatic experiences must be considered. Doubts have been expressed about the religious nature of the items found in the room: a bed, ceramics, bronze tools and vessels (Doumas 1992: 100). It is also a little unclear what are original contents and what was moved to the room at a later date. Yet the decoration seems too elaborate to interpret the room as a domestic or storage area and so it is considered here as a location for special events, perhaps of religious nature. Furthermore, the recovery of a horns of consecration in front of the east facade of the whole complex may point to a sacral room inside (Doumas 1992: 100). The scale of the room, 2.3 x 2.5 m., (Thera IV: 20) limits the number of people who could fit inside, so participation in any ritual would have been limited. Stürmer commented on the small size of the frescoed rooms he studied, as well as considering the amount of light which could have entered these areas (2001) (fig. 228). Certainly if the windows and the door were shut in Delta 2, this would lead to the space feeling even smaller, with participants experiencing a sense of being enclosed which perhaps would have been accompanied by physiological signs of mild panic or increased adrenaline. This heightened bodily state could easily be increased by stimulants, perhaps alcohol or other psychotropics. Indeed, if aromatics were burned, the olfactory stimulus would also help create a distinct atmosphere.

The holes pierced into the fresco may have held important items relevant to the room's function; Foster suggested insects or dragonflies, or real feathers (Foster 1995: 420). Marinatos recorded discovering a number of hooks in this room (Thera IV: 20) although he did not mention if they fitted into the holes in the walls. Both hooks and holes however could have been used to suspend items which appealed to another sense - that of sound. Acoustic stimulation is well-known as a

component of rituals, e.g. church bells or drumbeats. For small items which could be rattled or tinkled to be suspended from the wall, incorporated into the fresco yet also bringing it to life, could again affect the experience of the participant. The way a place is 'heard' and 'felt' is just as important as how it is 'seen' (Feld 2005: 182), and efforts to manipulate these senses for a desired result should not be overlooked.

Though it is undoubted that the fresco of the lilies dominates the small space, even such an apparently visual artefact need not be consumed with just the eyes. Howes has pointed out how touch and movement are essential for understanding Navajo sandpaintings, meaning that any analysis or interaction with such a picture that does not incorporate these modes of experience will be incomplete (Howes 2003: 8). Was this fresco meant to be touched, to be understood through the fingertips as well as the eyes? Did it have an aroma, or was anything smeared on it during the course of a ritual, giving a real smell to the floral representations? If the door and windows were shut, the flickering light from lamps would have changed how the fresco was perceived, creating shadows and even the effect of movement on the flowers. Whatever may have occurred inside this small room, it is probable that the experience would have created a strong bodily memory (in which the lilies themselves would have been an important element), perhaps strengthening religious belief or ties with the community.

Undoubtedly hypothetical in nature, such an exploration of a room's potential to affect the entire body and sensorium is a new departure in Minoan archaeology. All the senses could have been stimulated, perhaps aided by some form of psychotropic substance to make the experience all the more vivid, although this is not necessary. Altered states of consciousness can be achieved through bodily practices also, such as fasting, breathing, drumming and chanting. Such a proposal still does not explain the function of this highly-decorated room, but instead brings to the fore the variety of corporeal ways of experiencing it. To apply such a method to other frescoed rooms, especially those where a fresco is thought to have had ritual significance (e.g. Ayia Triadha, House of Ladies), may shed light on a Bronze Age religious experience. Consideration of the artefacts found within these rooms, as well as the images on the walls, needs to take into account that this prehistoric culture may not have been as visualist as the modern west, and tried to express and enhance other sensations through aesthetic productions (Classen 1998: 155).

6.3 "Les Fleurs du Mal"

A logical conclusion to this examination of Minoan floral iconography and multisensory ways of experiencing is to delve a little deeper into the erstwhile taboo subject of psychotropic plants, Baudelaire's "flowers of evil". In both of the case studies above, there has been mention of the use of such substances, a subject also discussed in connection with saffron in chapter four. Anthropological and ethnobotanical studies of societies from Mesoamerica to Siberia, from central Africa to Borneo, have all reported how psychotropic materials play an important role in the community. Economic behaviour, social organisation and belief systems are all deeply affected by the use of mind-altering plants (Pearson 2002: 107). In these traditional societies however, the drug use is restricted to ritual contexts and specific users, a key difference between them and the modern, western recreational use of these plants. This ritual use can cover a wide variety of situations, from communing with the spirits to sharing between members of society at socially appropriate moments. The same substance can fulfil a wide range of cultural roles, as demonstrated by the role of coca amongst the Barasana of Columbia. There, coca is used at work during the day, in men's conversation at night, and at periodic ritual dances, each use involving a different mode of behaviour (Hugh-Jones 1995: 51). Other societies, often those with wider trading relations, can utilise a range of different plants, usually resulting in their separation into different spheres of consumption (Sherratt 1995: 15). As Sherratt comments "any account of prehistoric Europe which omits a consideration of such substances [drugs] is likely to be incomplete" (Sherratt 1991: 52). The Minoans, however, remain as one of the few civilisations of the past who apparently did not require plant aids to perform rituals, commune with the spirits and divinities, or celebrate festivals. This seems an absurd situation when viewed in the context of world-wide human-plant interaction over the last six millennia, yet is there any evidence to suggest otherwise?

Aegean psychotropic plants

Firstly, it is important to ask whether any plants emerge as candidates for a Minoan entheogen? Neither palaeobotanical remains nor residue analysis has produced evidence of any such plant from Minoan contexts, although this perhaps is not a surprise considering the limitations of such techniques, as discussed in chapter one. But absence of plant traces does not have to imply absence of such plants. While the majority of psychoactive plants occur in the Tropics, Mediterranean Europe is not without species which contain powerful alkaloids too. The most common possibility are members of the Solanaceae family: *Hyoscyamus niger* (henbane), *Atropa belladonna* (deadly nightshade) and *Mandragora*

officinarum (mandrake). Henbane and mandrake can be found in Crete today, and certainly all three can grow in the Aegean (Turland, Chilton and Press 1993: 145-146). These plants contain the alkaloid scopolamine, responsible for intoxication followed by narcosis and hallucinations (Schultes and Hofman 1992: 86). They are most famous for being the drug of choice of witches in the Middle Ages, but have been recorded in use as far back as 1500 BC in the Ebers papyrus. The most potent parts of these plants are the seeds and roots (Schultes and Hofman 1992: 90). While none of these plants has been identified in Bronze Age art, this may be due to a simple failure to recognise them. For example, the necklace found in Shaft Grave III at Mycenae is suggested to show the pomegranate (Immerwahr 1989: 404), yet these beads, with their large jagged collars, could perhaps better represent henbane's seed capsule (figs. 229-230).

Another possible psychoactive from the Mediterranean is *Datura*. All species of *Datura* are chemically similar, possessing tropane alkaloids (as do the three plants already mentioned) which induce hallucinations (Schultes and Hofman 1992: 41). While many *Datura* can be found in the New World, most famously *D. stramonium*, others are native to Europe, and may be candidates for a local hallucinogen. *Datura* has not been identified in Bronze Age art, although the spiky seed capsules and white trumpet-shaped flowers may well have inspired some depictions, even perhaps the plants of the Phaistos krater (fig. 231). There has been debate over the possible narcotic powers of the Egyptian blue lotus, *Nymphaea caerulea* (Emboden 1981; Berst 2002); this plant could have been imported to the Aegean relatively easily and such properties harnessed. Opium, from the *Papaver somniferum*, is another narcotic possibly available during the Bronze Age, or at least from the Late Bronze Age onwards (Merlin 1984: 180), and is further discussed below. Many of the *Pancratium* species contain powerful alkaloids, and there are reports of the use of *P. trianthum* in Botswana as a hallucinogen (Schultes and Hofman 1992: 52). Could *P. maritimum* likewise be exploited in a similar fashion? The giant reed, *Arundo donax*, is thought to contain the powerful hallucinogen dimethyl tryptamine in its roots (Erowid 2006). Does this explain the Akrotiri reed fresco? *Peganum harmala*, a wild form of rue, was used across Central Asia for its psychoactive powers (Rudgley 1993: 50-51), and grows on Crete. These plants are a sample of the psychoactive ones available in the Aegean today and during the Bronze Age. Moreover, it must be remembered that such plant substances have long been subject to trade and those from further afield could also have been known and used in Greece.

Psychotropic consumption

Material culture offers a way of recognising the use of plant-based psychotropics because a range of suitable vessels and equipment is normally associated with consuming these substances. Such artefacts can often reveal the social status of the user, as well as the symbolic importance of altered states (Rudgely 1993: 144). Such equipment can be decorated with the relevant plants, and moreover, these important (often sacred) plants can feature quite prominently in the art of these societies (Emboden 1979: xiv). The art of the Huichols of Mexico gives the peyote cactus a central role, reflecting its role in the life of the society and as an expression of Huichol identity (Myerhoff 1974) (fig. 62), while Nazca ceramics abound with references to the hallucinogens necessary to maintain contact with other worlds (Dobkin de Rios 1980), and *ololiuqui*, the sacred Morning Glory, can be seen in much Aztec art (Schultes and Hofman 1992: 158-163). Is it possible that any of the Aegean artefacts decorated with plants are indications of such a use? Furthermore, are there any Minoan vessels which could have been used for preparing or consuming psychotropics?

The methods devised by humans to ingest psychoactive substances are many and diverse, ranging from eating and drinking, to smoking and snorting, as well as enemas, application of substances to sensitive membranes, and even the deliberate creation of wounds as an opening into the body. Hence the range of associated material culture is vast and varies according to the method of consumption. Simple eating of any such substance will be hardest to detect, unless serving vessels feature relevant decoration, and even then the link between depiction and consumption is not indisputable. However, eating is not an especially common way to ingest many plant-based drugs. Usually the plant matter requires some form of preparation prior to consumption, such as drying, cooking, grating, extracting alkaloids, or extracting seeds. Once this cultural modification has taken place, turning the natural product into one suitable for human consumption, it must be added to a suitable medium. Liquids are the most frequently used method of consumption, and have several advantages including that they are easy to share in communal settings and allow for the mixing of ingredients according to taste, as well as desired strength and effects of the mixture.

Alcohol, in particular wine, has long been considered the social lubricant and ritual drink of the Aegean. That other plants were added to this alcohol to increase potency is certainly a possibility. For example, the Wari added hallucinogenic *Anadenanthera* to the *chicha* to be drunk at important communal gatherings to

enhance the religious experience (Knobloch 2000). Sherratt has suggested the addition of opium and cannabis to alcohol by certain Neolithic cultures in Europe (Sherratt 1987; 1991). Infusions of the Aegean plants mentioned above could easily have been made: henbane, datura and the DMT of reeds are all consumable in liquid form. The rise of apparent sets of vessels designed specifically for drinking in the Early Bronze Age, and their association with palatial centres in the latter phases of the Bronze Age, certainly indicates an increased interest in communal drinking. It is important to bear in mind that although the term 'communal' perhaps implies equal participation by all, there would have been a very distinct gap between those who attended such events, and those who were excluded, or at least not full participants. Such status gaps can be created and reinforced by differential drinking vessels, and even the serving of different beverages.[68] These Minoan sets include larger vessels for serving, and numerous small cups for drinking. Conical cups are in fact one of the most common types of find on Crete, and have been associated, at least during the Neopalatial, with token hospitality: the offering of drink by a person of superior social level to inferiors on their arrival at an elite structure (Rupp and Tsipopoulou 1999). They also indicate individual portions of drink, accompanied by the implication of serving and being served, a new phenomenon emerging in late EM IIa (Day and Wilson 2004: 57; Day and Wilson 2002: 152). The small size of drinking vessels may also suggest that the mixture inside was quite potent (akin to modern shot glasses), perhaps due to plant admixtures. It may be more reasonable to consider that at times the cups contained simply an alcoholic beverage (e.g. that offered on entry to palaces), and at other times the mixture was enhanced (e.g. at feasting events). Finally, it is worth bearing in mind that visual stimuli are one of a number of sensory cues which can guide or affect a person experiencing an altered state of consciousness. While it may be pushing the evidence to the limits, it could be suggested that the elaborate decoration on some of the vessels apparently used in elite feasting contexts played a role in enhancing any psychotropic experience.

Smoke inhalation is another popular method for consuming psychotropics, and as a practice is both very ancient and very widespread. Smoking often plays a role in ceremonies associated with the spirits, as it can be a visible manifestation of the ethereal spirit world, while the blowing and sucking of smoke can be seen as a metaphor for the transfer of spiritual power (von Gernet 1995: 69). A broad range of paraphernalia accompanies smoking, not all of which will be archaeologically visible, e.g. wooden pipes, and leather pouches or wooden boxes for holding plant matter. That being said, pipes can come in a variety of shapes, sizes and materials, including 'open' ones for directing smoke into the atmosphere, and 'closed' ones

[68] See Mars 1987 for a study of exclusionary drinking.

for more direct inhalation (Merlin 1984: 243). When Merrillees suggested an opium trade in the late Bronze Age Levant based primarily on the poppy-capsule shape of Base-ring ware (fig. 232), he logically saw the drug travelling in liquid form inside these vessels (Merrillees 1962: 290). Indeed an infusion of opium in alcohol, known as laudanum, was the nineteenth-century opium-eater's method of delivery of choice (Hodgson 1999: 2). The *nepenthe* of Homer may have been a similar concoction (Emboden 1972: 219). Yet a late Bronze Age ivory pipe recovered at Kition, in Cyprus (fig. 233), suggests direct inhalation of substances played a part in the rites performed at the sanctuary, with the excavator suggesting opium as a possible candidate (Karageorghis 1976).

Turning to Crete, it is not a new suggestion that the clay tubes found in LM III sanctuaries were associated with inhalation of psychotropics (see Karageorghis 1976 for references) (fig. 234). Mainstream archaeology appears to have mostly ignored this interpretation, and other suggestions for such tubes have included houses for sacred snakes, libation vessels for chthonic cult, symbols of divinity, flower vases, stands for offering bowls, and incense burners (Cadogan 1973; Gesell 1976). Many tubes lack bottoms, and so could be placed over a brazier to form a funnel for smoke; others have bottoms and so could have held charcoal directly, or perhaps contained smaller vessels which themselves held the burning material. Some of them also have holes in their sides, or are decorated with vertical loops (the "snakes"). The LM III Gazi Goddess, who wears poppy capsules on her head (fig. 235), is another piece of evidence which has been used to support a role for narcotics in Bronze Age religion. The incised marks on the capsules suggest that the practice of scoring the plant to let the raw opium seep out was known in the Late Bronze Age (Merlin 1984: 240). The plaques which are frequently found in LM IIIb-c shrines along with the tubes and goddesses with upraised arms could be a third indication of the inhalation of opium or some other substance (fig. 236). Gesell interprets these artefacts as a form of "sacred marker" which may have had religious scenes painted on them (Gesell 2001: 257). An alternative, which ties in well with other material from the shrines including charcoal remains, is that the plaques were placed on top of the tubes or directly on braziers and used for heating the psychotropics and so dispelling smoke into the air, in the manner of an 'open pipe'. That they are made in the same clay as the goddesses and tubes with which they are found suggests they form a set of utensils, all for use in the same ritual (Day *et al.* 2006). It is of interest to note that small trays were part of the traditional Chinese opium smoker's equipment, on which all the necessary items were laid out and easily accessible (Hodgson 1999: 54; 60), but to extend such an analogy back to the Bronze Age is highly

speculative. Other Bronze Age artefacts which may suggest knowledge of opium include the Mycenae ring where the seated female holds poppies (fig. 237); long metal pins with crystal poppy heads (Mylonas 1966: fig. 136); a LM IIIa pyxis from Pachyammos shows birds and poppies (Marinatos and Hirmer 1960: fig. 124); a LM IIIc kalathos from Halasmenos may show poppies (Tsipopoulou 2004: fig. 8.12); two LM III poppy capsule-shaped rhyta painted with incisions from Mochlos (Nicgorski 1999); and the poppy-shaped half-capital from Knossos (fig. 147).

Yet these artefacts are all confined to the later Bronze Age and mostly associated with Mycenaean culture, or even found on the mainland. Does this indicate that the Minoans were not a "smoking culture"? While Sherratt has traced the transformation of Eurasia from a smoking culture to one of drinking during the fourth and third millennia BC (Sherratt 1991; 1987), this does not mean necessarily that smoking was completely replaced, but rather the primary means of consumption changed. In fact, it is possible to identify vessels which suggest that burning plant materials did play a part in life on Crete throughout the Bronze Age. Ceramic "incense burners" consisting of two separate pieces, a cup and a pierced cover, can be identified from LM IIIa contexts, usually tombs and shrines (Georgiou 1979) (fig. 169). It is thought that aromatic substances were placed on the coals inside to produce a pleasant smell. That they could have been used for dispensing smoke as part of the mortuary rituals is also possible, helping create an environment conducive to spirits and one which will become embedded in the sensory memory of the living. Hamilakis suggested a similar function for alcohol consumption at tombs, where bodily memory perhaps played a role in power negotiations (Hamilakis 1998: 126). It is also possible that the substances burned in these vessels could have had psychotropic effects, perhaps opening communication with the dead or spirits, and serving as an effective way of uniting participants in the rites at the tomb. Such rites need not have been carried out with every interment, but perhaps at special times of year or other important days, serving as a way to reinforce family or society bonds, embedding in the body a memory of a link with both the past (the dead) and the present (other participants).

Moving further back in time, the MM III-LM I "fireboxes" have provoked abundant discussion, and suggested functions include cooking vessels, braziers, coal shovels, hot-plates, oil or incense burners, censers and a role in manufacturing aromatics (Georgiou 1980: 154-158). The only connection between all these interpretations is that the vessels were linked with fire and heat in some way, and traces of burning are evident on some of them, on both interiors and

exteriors. Georgiou has organised the fireboxes into three types, all of which are pierced on their lower surface, and concludes that they were perhaps used in the manufacture of aromatics (Georgiou 1980: 173) (fig. 238). The precise mechanics of how they functioned remains unclear though, and Evely's point that in fact these objects were "a means for releasing the scent rather than capturing it in its manufacture" makes better sense (Evely 2000: 540). The scuttle-shaped vessel held by the West House Priestess is similar in shape to Georgiou's Type 2 burner, and supports the idea that she is depicted burning aromatic substances (fig. 168). Regarding what was burned in or on these fireboxes, to suggest they all were for psychotropics would be to be guilty of reductionism, but as with incense burners, they may sometimes have held such substances. As they predate the burners and tubes discussed above, it is possible they may have had a similar role before being outmoded by the new methods of burning. However the vast majority come from settlement contexts rather than tombs or shrines. This would appear to indicate that they were not connected with mortuary rites or ritual. Moreover, it is unlikely that psychotropic use would have occurred in a domestic context, but rather would have been reserved for ceremonial occasions, in specific settings. Yet these vessels could be used for such purposes, and perhaps were multifunctional. At the very least, fireboxes suggest that use of aromatics was prevalent in the Bronze Age Aegean (Georgiou 1973: 453).

Turning to the Early Minoan and early Middle Minoan periods, purpose-made vessels connected with burning are less apparent, although certainly some of those from the Mesara tombs functioned in this way (Xanthoudides 1924). In the context of this chapter though it is worth mentioning the palettes which were recovered from a number these tholoi (Xanthoudides 1924: 16) (fig. 239). Little has been said about these limestone trays which are between two and four centimetres thick, with the dimensions of the largest one 18 x 22 cm. (Xanthoudides 1924: 16). They tend to have one flat side, sometimes with evidence of rubbing or grinding, edged by a raised moulding, while the other side is slightly convex. No traces of colour have been found on any of them, suggesting they are not colour palettes like those of Egypt or the Cyclades. Xanthoudides believed them to be tables of offering (Xanthoudides 1924: 16). It may be preferable to see them as used more actively in the rites occurring at tombs and as components of sets of necessary objects for mourning the dead or communing with spirits. That such rites involved drinking, based on ceramic remains, and dancing or other performance on the external paved areas, has been suggested (Hamilakis 1998; Branigan 1970). The palettes may have been used in the preparation of plant substances to add to the beverage (grinding etc.), or as trays

for presenting and facilitating the snuffing of such material. Such trays can be found buried with the dead in numerous cultures of Pre-Columbian South America, along with bone or wood snuffing tubes, spoons or spatulas, containers for plant material and pouches to carry it all in (Torres 1995: 293) (fig. 240). Analysis of plant material found with such kits from San Pedro in the Atacama indicate that they were used for consuming hallucinogens belonging to the *Anadenanthera* genus (Torres *et al.* 1991). Cretan conditions are not as conducive to plant preservation as the dry altiplano of Chile, so not only are any traces of wood or textile long wasted away, but plant remains within the tholoi are rare. Obviously Bronze Age Crete cannot simply be likened to Andean America but the key point is that distinctive paraphernalia have been found in both areas in mortuary contexts, which are believed to form a package of associated goods for communicating with the spirits and forging memories of the event (fig. 241).

Linked to the phenomenon of specialist sets of equipment, another key point regarding psychoactive substances (including alcohol) emerges: the importance of the ritual of consumption. The tea ceremony in Japan or kava ceremony in Tonga perhaps take such rituals to extremes (Kondo 2005; Bott 1987), but the correct equipment and environment are as important as the actual substance in many instances of consumption. This is brought to the fore in Hodgson's study of opium use: "Opium demands much from its admirers; ... the ritual becomes a precious pastime, the pipes elicit an almost mystical tenderness, and the den takes on the aura of another world" (Hodgson 1999: 53). The drug is consumed in the correct location (the "den"), the necessary equipment ranging from pipe to needle to lamp is assembled on a tray, the opium itself is cooked until ready for inhalation at which point it is inserted into the pipe and the smoker breathes in. Ethnographic accounts also highlight the rituals surrounding the taking of any drug, from the casual social sharing of the betel nut and lime to the complex pilgrimage to the peyote grounds undertaken by the Huichol. It is not just the physiological or neurological changes which occur after consumption which are important for bodily memories but the preparation prior to consumption, heightened by anticipation, is also part of the whole experience.

Iconographic hints?

All the material cited so far has related to methods of preparation and consumption, but what about actual imagery of consumption, or imagery inspired by consumption of such substances? Ethnographic work has demonstrated that much art created by pre-modern societies can be linked to experiences of altered states of consciousness. A near-universal link between rock art and shamanism

has been suggested with many of the scenes painted or carved on the rock representing the entoptic images seen in trance state, as well as the physiological changes undergone by those in an altered state (e.g. Clottes and Lewis-Williams 1998). Another example comes from Nazca iconography where the prevalent "flying god of Paracas" is now believed to stand for shamans on spirit journeys (Pearson 2002: 141). It has even been suggested that among the Fang of west-central Africa, the transition from simple art to a highly colourful and decorated one was due to their adoption of iboga (*Tabernanthe iboga)* in cult, as it encourages coloured visions (De Smet 1998: 64-65). The large majority of Minoan specialists have not sought to understand Minoan art in these terms.

Evans certainly considered the possibility that Minoans used plant extracts to aid communication with the divine. He suggested that some of the scenes on rings may be orgiastic dances, commenting "it is the juice of the sacred fruit, like the Soma of the Vedas, that supplies the religious frenzy, and at the same time implies a communion with the divinity inherent in the tree" (PM III: 142). Later he noted the resemblance of the scene on the Vapheio ring with a picture he had seen of some Lapps "where the Shamanistic sooth-sayer, after long chanting, accompanied by the pulsation of his troll-drum, has fallen in the same ecstatic state of possession" (PM III: 315). More recent research on the Neopalatial gold rings has suggested that in some cases the imagery is located inside the experiential world of the participants (Morris 2004: 38). The distortions of the heads and streams of dots emerging from them may stem from trying to depict an actual physiological sensation undergone by those experiencing an altered state of consciousness (Morris 2004: 40) (figs. 46-48). Reports of subjects who have taken psychoactives often include a sensation of pressure on the head and a changing of the shape of body-parts (Devereux 1997: 163). Such sensations vary according to the substance used, but interestingly henbane and the *Solanaceae* in general are especially noted for inspiring feelings of flying and of head elongation (Rudgley 1993: 90-95). Indeed flight is also depicted on the gold rings, in the form of birds, butterflies, dragonflies and even hovering figures (Morris 2004: 40-41). Again these may be seen as elements of experiencing trances. That being said, altered states of consciousness can be achieved without the help of plants, as mentioned above, and so even if these rings were depictions of such events, there is no guarantee that plants were involved (although see the discussion of plants on such rings in chapter four). Furthermore, the misshapen heads and dots could be indications of hair or other artistic conventions.

6.4 Final Comments

This chapter has explored what are perhaps more speculative issues within Minoan archaeology. Nonetheless, the increasing interest in the body and its senses among academics must lead to new interpretations of material culture. A sensory analysis of different Aegean Bronze Age artefacts demonstrates the ways that cultural practices, be they feasting, drinking or religious rituals, can be experienced and inscribed/absorbed in the body's memory. While such activities do not require psychotropics, that they featured in at least some of these events should be considered. The potential for further studies of sensory issues in the Minoan world is enormous. For example, the acoustemology (Feld 2005: 185) of palaces has not, as yet, been considered.[69] Space is lacking to delve deeper into such matters here, but that the aural impact of water may have been considered when constructing water provisions in elite buildings is quite likely. At the Caravanserai, water flowing into the footbath from the stone channel may have splashed in gently, and similarly, water leaving the footbath and pouring into the drinking trough may have trickled lazily downwards (PM II.1: figs. 55, 57). In the Court of the Stone Spout at Knossos, water emerged via a spout from high on the wall to tumble downwards into the light well (Shaw 1973: 128). The water cascading down the East Bastion also must have made some sort of bubbling and rushing noise as it entered and left the settling basins (fig. 242) (PM III: fig. 168). Although later in date, the Tylissos cistern was constructed so that when it was being filled water spurted into it from a spout and fell onto a specially placed slab to enhance the noise (Shaw 1973: 128).

Another area ripe for a sensory analysis is the Minoan garden. While still lacking solid proof for such spaces, it was demonstrated in chapter five that their existence is probable, even if made up of pot plants rather than flowerbeds. But gardens and plants are not just features to be observed from a distance, but to be interacted with in a variety of ways. Gardens are places designed to please the senses; not just sight, but smell, touch, sound and even taste can all come into play in a garden venue. Furthermore, the experience is one which constantly changes, as gardens themselves experience different phenomena: sun, wind, rain, snow, ice, water, seasons and light all contribute to the ephemeral nature of the place, and the changing impression the visitor absorbs. Also, not all visitors will experience the garden in the same way, as social status and gender can affect access. Who was allowed to experience what in a Minoan garden is a question of as much interest as whether the gardens existed at all.

It is unlikely that Bronze Age feasts featured anything comparable to the Futurist

[69] Western European prehistory has begun to consider such issues, e.g. Watson and Keating 1999.

delight "Raw meat torn by trumpet fanfare": a perfect cube of beef has an electric current passed through it, then is marinated for 24 hours in a mixture of rum, cognac and vermouth. Removed from the marinade, it is served on a bed of red pepper, black pepper, and snow. Each mouthful is chewed carefully for one minute, and is divided from the next by vehement blasts on a trumpet blown by the diner (Marinetti 1989: 102). But that the Minoan world was comprised of numerous sensory stimuli, perhaps appealing to a different sensory make-up than that of the excavators who have uncovered them, must be appreciated. Like Proust's Marcel, who was aware that his feelings were connected with the mouthful of tea and cake but at the same time infinitely transcended those flavours, Aegean archaeologists should now look beyond the exclusive visual examination of Minoan art, and consider its appeal to the other senses and the implications of these somatic souvenirs.

Conclusion

> "I love flowers Id love to have the whole place swimming in roses God of heaven theres nothing like nature the wild mountains then the sea and the waves rushing then the beautiful country with fields of oats and wheat and all kinds of things and all the fine cattle going about that would do your heart good to see rivers and lakes and flowers all sorts of shapes and smells and colours springing up even out of the ditches primroses and violets nature it is"
> (Joyce 1922: 931)

Numerous different issues have been explored in the course of this thesis, and rather than ending up with one final 'result', the outcome is more a series of new ideas and different approaches to the Minoan floral world. These have been summarised at the end of each chapter, and this concluding chapter will focus on drawing the entire work together, rather than repeat much of what has been said earlier. The original starting point was to examine how archaeologists have approached the issue of the Bronze Age plant world throughout the twentieth century. It became obvious almost immediately that two separate methodologies have been developed to cope with the material: palaeobotany and iconography. Although perhaps not a conscious decision, the 'scientific' discipline retreated into the realm of laboratories and microscopes, especially since the late 1960s. Ironically, the more breakthroughs which appear in palaeobotanical methods, the more and more specialised the studies become, taking them ever further from the original people who used the plants. Of course, information that pollen analysis or phytolith studies yield is extremely valuable, but it is argued here that these results ought to be further integrated into studying cultural and social issues, rather than remaining aloof as disciplines in themselves. Such integration has certainly been the case in some of the more recent palaeobotanical studies, where attention has moved on from simple description of finds and later processual concerns with carrying-capacity of land, to considering historical ecologies. The increasing role of vegetation studies in archaeological surveys was also noted in chapter one, and again is a step towards a more integrated archaeology. Ethnographic work also has been helpful in illuminating the practices which surround the actual use of plants, whether it is harvesting or preparing food. Greater numbers of archaeological projects now include an ethnographic component, and while there are dangers in extrapolating back to the Bronze Age based on recent practices, such information is important in illustrating how people work with the world of plants to benefit themselves and the community.

One of the main limitations of palaeobotanical studies is that they are always based

on relatively limited evidence, i.e. that which is preserved. The numerous wall-paintings and other depictions of plants from Minoan times reveal a whole other plant world of which the people were aware and with which they interacted. Numerous iconographic studies have been devoted to exploring this explosion of nature, but closer analysis of such works indicates that the majority have been considering the same questions for over a century. The identification of the species depicted, the varying degrees of naturalism with which they are shown and the interconnection between different media have all been at the forefront of studies. Initially, one of my hopes was to work closely with botanists and among the actual flora of Crete, to definitively identify the species depicted in Minoan art. However, this proved an impossible aim due to the number of plants that are not realistically depicted. While this problem has led other scholars to argue for the role of hybrids in Minoan art as an answer to unfamiliar plants, instead I became intrigued by the question of why we expect these plants to have been depicted in a realistic fashion. Tracing the development of botanical art in chapter three allowed me to understand the western tradition of plant illustration out of which this assumption emerged, and opened up the possibility that we should not always expect a real plant to be intended by the Minoan artist.

Several new areas of research were embedded within this overview of iconography in chapter two. The overlap between palaeobotany and iconography has been minimal, yet there are also representations of plants that I have chosen to term "traditional crop plants", a not entirely satisfactory label, it must be added. Grains, vines, vetches, and olives all receive due attention from the palaeobotanists, yet the iconographers ignore them. I suggest that these types of plants suffer from being understood as "crops" and therefore devoid of meaning apart from calorific value. Hence, when faced with pictures of intriguing lilies and crocuses, or apparently dull vetches, the iconographers have unhesitatingly opted to focus on the former. In fact, crop plants can be imbued with just as much meaning as non-crop plants, a fact demonstrated by ethnobotanical and anthropological studies. In this thesis, space did not allow for an exploration of potential meanings of plants such as grains, fruits and nuts, or even reeds, but Appendix I gathers together many of their representations and shows that they too formed an important part of the iconographic record, and must not be ignored. It is hoped that future studies will focus on these plants and, used together with palaeobotanical results, will illuminate the roles they may have played in Minoan life.

Another new concept which was developed in chapter two, and returned to in chapter five, is the idea of plants travelling around the eastern Mediterranean

during the Bronze Age. The similarity between motifs found in frescoes in places as diverse as Egypt, Israel and Greece has long puzzled scholars. Travelling painters is one way of solving the mystery, and certainly there is evidence from Late Bronze Age Egypt and the Near East for mobile craftsmen. It seems quite likely, in the light of the vibrant trading and travelling which characterised the Mediterranean in this period, that painters would have come to Crete, as well as gone from there to other places, thus contributing to a spread of motifs. What is perhaps more interesting is whether the associated ideas behind the motifs also travelled. Papyrus was important in Egypt, both from a utilitarian view and for its mythological role, and it seems certain that the crocus was similarly important on Crete. Did such meanings accompany the pictures of plants to other countries? It may be preferable to understand the shared motifs as reflecting Bronze Age elites buying into a mode of self-representation. Displaying images of foreign plants and animals would have been a highly effective way of demonstrating knowledge of distant lands, and therefore underlining power and reinforcing status within society.

It is also possible though that the real plants did move around, either through trade, as booty, or in gift-exchange. Minoan representations of plants actually on the move are rare; there is no equivalent of the stone-carved representation of Hatshepsut's expedition, where trees were carefully carried in baskets. If the Minoan elite had gardens, then plants from overseas would have been likely to feature. Chapter five investigates this garden question, and is the first detailed analysis of the issue. My conclusion is that certainly there are locations where gardens could have existed within elite complexes, although they may have been filled with plants in pots, rather than planted with soil beds. Larger parks with exotics may have existed beyond the urban centres also, but it seems unlikely that evidence for these will ever be recovered. I suggest that, along with their neighbours to the east and south, Minoans did have gardens, and were well aware of the prestige associated with owning and maintaining exotic plants and animals.

In the course of researching the meanings of plants, I became aware for the first time of the discipline of ethnobotany. Exploring this field further, it became obvious that here was an important way of approaching the relationship between people and plants. The issues with which it deals, and the methods used to elucidate information, are different to those found in traditional archaeological works. Could they be successfully applied, however, to a society which no longer existed? Chapter three is dedicated to exploring this idea, resulting in varying success. For example, the role of plants in myths seems almost universal, and it may be that some plants prevalent in Minoan art had a mythological prominence, although this

is one area where the absence of a living informant or relevant textual information means that definitive answers remain elusive. The association of certain animals and plants with each other in Minoan imagery may be a clue pointing in this direction. This became clearer when the iconography of the crocus was studied in detail. The strong connection of this flower with the monkey, as well as birds, deer, and dolphins, may reflect a creation myth, or at least symbols which were meaningfully grouped together based on a mythical past.

A comparative study was made between an ethnobotanical project about a group of Brazilian Indians and the environmental work carried out at Kommos. It is important to reiterate that it was the methodologies used and the questions asked of the material which are relevant, rather than any direct comparison between Minoans and forest Indians. Although the Kommos project is one of the most detailed ever carried out on Crete, it illuminated the types of questions Aegean archaeologists do *not* ask about plants. These questions were elaborated upon in the final two sections of chapter three, dealing with how Minoans might have conceptualised the natural world, and how they might have classified plants. While every society assigns different meanings to plants, it appears that there are cross-cultural similarities involved in organising this material. Two key conclusions arise out of these studies. Firstly, that Minoans would have undoubtedly understood their relationship to the natural world in a different light than post-Cartesian westerners, hence ideas about domination or exploitation should not just be unquestioningly foisted upon them. Secondly, it is to be expected that a Bronze Age society which cultivated plants would cognitively recognise at least 500 genera, and would classify them, allowing the world to be understood and relevant information to be shared. It is highly likely that Minoan ways of organising plants do not correspond with modern ways; for example, bulbous plants like crocuses, lilies, irises and squills may have been understood as more closely related than modern botany allows. The idea of differential knowledge of plants was also discussed, and it is to be expected that specialists, perhaps with a religious/medical function, would have existed who knew more about the locations and uses of plants than non-specialists. To end this chapter, a somewhat tongue-in-cheek scenario of the perfect ethnobotanical/archaeological enquiry was included. On looking closely at the necessary elements for such a study however, it emerges that a more holistic investigation of the Bronze Age relationship with plants may not be as difficult to achieve as initially feared, and perhaps in the near future, fieldwork will incorporate these methods and accomplish such a task.

Considering people-plant relationships from an anthropological view, as well as

looking at the history of western plant studies, allowed me to understand why certain assumptions were made about Minoans and their plants, and why these are often incorrect. A detailed examination of one particular plant follows these general theoretical studies, in the hope of arriving at a better understanding of why a flower might be important to a society. The crocus was chosen to be the subject of chapter four, primarily due to an interest in saffron sparked a number of years previously, as well as its obvious prevalence in Minoan art. One initial hope for this chapter was to include a complete catalogue of crocus imagery from the Aegean Bronze Age. While this was achieved for frescoes (Tables 4.1 - 4.4) and other media such as faience and jewellery, it proved impossible for ceramics. The stumbling block here was the dilemma over what exactly counts as a deliberate crocus, and what is a trefoil motif. Kamares ware in particular proved extremely difficult to categorise, although LM Ia-Ib crocuses are easily identifiable. It was decided therefore to attempt to trace the chronological development of the motif on ceramics, illustrated with key examples of each style. I suggest that although easily-recognisable crocuses do not emerge until MM III, they were perhaps intended on earlier vessels by a trifoliate motif. It emerges from this study of artefacts with crocus imagery that there is a definite link between vessels, or features, deemed as ritually important and the flower. Although this has been posited by previous commentators, none has referred to the entire corpus of crocus material, preferring to speculate based solely on frescoes or ceramics.

Reasons for such a link become clearer when the potential of saffron is explored. It has a long and widespread history of use in medicine, only recently being investigated once more in the west. Also useful as a colourant, it can be employed to give a yellow hue to cloth, food, drink, skin, paper, and numerous other materials. In fact, a link between females and yellow seems to exist in the Bronze Age, perhaps arising originally out of saffron's gynaecological powers. Again, some of these areas have been explored by other archaeologists, but nowhere as comprehensively as in this study. A new suggestion made in chapter four raises the possibility that coloured food or drink might have played important roles at feasting events, serving as a mark of status. That the crocus was important for all these reasons seems likely, and it must be understood as a polysemic symbol, gaining meaning through context, rather than constantly tied to one specific meaning. Chapter four also includes a description of my trip to Krokos for the saffron harvest. This fieldwork was undertaken so that I could clarify the inconsistencies which occur in saffron-related literature. It also drove home to me how a single high-value crop can transform life in a region, something which may well have happened on Bronze Age Thera or Crete. Indeed, I suggest that during

Mycenaean times on Crete, saffron collection gradually became better organised, as evidenced by the larger quantities recorded in Linear B later in this era. This could indicate a Mycenaean desire to get involved in a lucrative trade, leading to the replacement of Minoan symbolic associations for the flower by an economic outlook in LM III. This would also explain the lack of crocus imagery on Mycenaean ceramics and frescoes.

It is not just saffron that was recorded in Linear B, but other spices too. Admittedly dating to post-Minoan times, it is too rich a source on plants (which otherwise would be invisible in the archaeological record) to be ignored. However, it was demonstrated in chapter three that some of the plants mentioned in the texts can be seen in Minoan material culture, such as the rose, crocus, mint and rock-rose. If translation of the tablets is correct, other plants would have had to be imported from further afield at some stage during the Bronze Age (cumin, myrrh, henna, sesame). However, there is no reason why they could not have been cultivated in Greece once initially imported. These aromatic substances also reveal an interest in smell and aroma, which was more fully explored in chapter six.

This final chapter is undoubtedly the most speculative part of this thesis. However, it deals with important issues, and unless a certain amount of speculation is carried out, scholarship will never advance beyond tried and trusted waters. Following recent studies on the body, perception, and the senses, I felt it was important to explore how Minoan artefacts could affect and interact with people. This is, I believe, especially pertinent when dealing with flowers, as smell is their key attribute, yet has been overlooked in every assessment of Minoan floral iconography. An examination of the intriguing class of vessels with floral relief not only updated and corrected Foster's initial work (Foster 1982) but suggested new ways in which these vessels could have played a role at social gatherings, by acting as mnemonic links as well as sensory stimulants. I also wanted to examine an architectural space, and so the room of the Spring Fresco was studied with the aim of exploring its potential for multisensory-experiences. Such studies should be seen as one way of moving Minoan archaeology forward and providing a better understanding of the experience of Bronze Age life.

To close chapter six, I decided to investigate whether the Minoans could have used plant-based psychotropic substances as part of their rituals. The number of other societies around the world, past and present, who have done just this is vast, yet the issue has been basically ignored by Minoan archaeologists. I would suggest that the reasons for this are twofold. Initially, the Minoans were seen as the forerunners

of the classical Greeks, who, in turn, were seen as the ancestors of western Europe. Any research which might suggest that the culture viewed as the foundation of rational European values and society indulged in mind-altering practices would not have been encouraged. Such reluctance is, of course, a product of the status of these substances in modern western society, where their use has long been frowned upon and associated with anti-authoritarian movements. Indeed, I would argue that Minoan scholars have steered clear of this subject for fear of not being taken seriously, and have chosen to remain in academically safer waters, such as pottery typologies. Solid evidence of such practices is difficult to produce, as was demonstrated, yet there are potential plant candidates, as well as artefacts which possibly were used to facilitate consuming such substances. It is hoped that as our understanding of Minoan ritual practice expands, the potential roles of powerful plants may well be acknowledged in the near future.

In the Introduction, it was stated that the course of human culture has been deeply influenced by plants. Throughout this thesis, this has been a guiding principle, whether studying Minoan floral motifs or considering why gardens might have been important in the Bronze Age Aegean. Although only a sample of such issues has been investigated here, it is hoped that an awareness of the multiple social roles of plants has been raised, and the potential for further investigation realised.

Appendix I: The Iconography of Traditional Crop Plants

The discrepancy between the palaeobotanic remains from the Aegean and the artistic representations of plants in the region must be stressed. There is an increasing amount of palaeobotanical evidence indicating which different grains, pulses and fruits were consumed and perhaps cultivated by Bronze Age peoples around the Aegean, as demonstrated in chapter one. The lists of plants 'identified' in the art also continually increases. Sarpaki rightly noted that few of the plants commonly depicted in wall-paintings have been recovered archaeobotanically, for example, lilies and crocuses (Sarpaki 2000b: 666-667). She does not comment on the fact that there are also several plants which are visible palaeobotanically, mostly through having been stored as food crops, and which do appear regularly in Minoan and Theran art. Often left out of iconographic studies, perhaps because as 'food plants' they seem less intriguing, these examples are summarised below.

Olive

The olive is one plant whose palaeobotanic record is matched by its iconographic appearances. On Crete, Knossos is the sole place where olive trees are found in wall-paintings, and some of these identifications are tentative. Apart from the Sacred Grove and Dance (fig. 243), and the Crocus and Agrimia Panel from House of the Frescoes (fig. 70), painted remains of olive trees are fragmentary. The Charging Bull and Tree scene from the North Entrance exhibits a different style of olive tree, with the branches painted in a more sinuous manner, as opposed to the pale wash with details added in a darker colour which characterises the two examples cited above (fig. 244). Other less certain identifications of olive in frescoes come from different contexts around Knossos (e.g fig. 245). Further afield, the tree that Abramovitz noted on the Ayia Irini frescoes may be an olive (Abramovitz 1980: 76; pl. 9: 176), as may some of the leaves from a Tell el Dab'a painting (Niemeier and Neimeier 1998: 80). The fresco from Alalakh once considered as possible olive leaves is now thought more likely to be a griffin's wing (Niemeier and Neimeier 2000: 787). Olive trees have not been identified in any wall-painting from Akrotiri to date, although olive leaves are one interpretation for the Delta 17 plant fresco (Immerwahr 1990: 188), also seen as cannabis (Rackham 1978: 756) or osiers (Thera VII: 14). The only other possible appearance of olive in a fresco from Akrotiri is the hair ornament of the seated girl in the Adorants scene, Xeste 3. For further examples of olives in wall-painting, it is necessary to turn to the LH III mainland frescoes at Tiryns and Pylos, where the trees are highly stylised. Ceramics with olive decoration are not especially abundant in Minoan times, although this may be due to the perennial difficulty in

differentiating an olive leaf, or indeed fruit, from a generic pointed leaf shape or rounded motif. However, some vessels from Knossos are thought to show olive branches; the slender leaf is accompanied by white dots for the inflorescence (Möbius 1933: figs. 7g-i). Walberg has also suggested that olive is the intended plant on the amphora F2723 from Phaistos (Walberg 1992: 245; Levi 1976: Pl. LXXVII). She notes that in LM I and LM II pottery, the olive only appears infrequently (Walberg 1992: 245). Popham, however, has identified a LM I 'olive spray' painter from matching examples of the motif at Knossos and Palaikastro (Popham 1967: 341).

Cereals

The most frequently recovered form of palaeobotanic remains from the Aegean region is grain of different sorts. Yet barley, wheat or other cereal crops do not appear at all in wall-paintings from the Minoan world. One later example is the LH IIIb 'Goddess of the Sheaves', from Mycenae, who clutches an apparent bundle of grain (fig. 246). On ceramics however, there are examples where cereals do feature. Marinatos recovered a number of LM Ia nippled ewers or jugs from Akrotiri, some of which have representations of grain on them (Thera II: pl. 30.2; pl. 36.1; Thera IV: pl. Hc; pl. 73) (fig. 247). He viewed these as libation vessels, and suggested the dark-on-light barley imagery was linked to fertility (Thera II: 42). Rackham does not agree with some of the identifications as barley, and prefers to see a wild grass for Thera II: pl. 36.1 (Rackham 1978: 757). A skyphos was also found at the same site, decorated with "ears of sacred corn" (Thera VII; 29; pl. 45). Evans recovered a small jug from Knossos with a triple spray of grain (barley) in relief on it (PM I: fig. 299a-b). He thought it may have been used to hold a liquid "not unconnected with John Barleycorn" (PM I: 415), although he does not elaborate whether it might have been used in a sacred or secular context.

Vetches

Vetches are another type of plant which leaves palaeobotanical traces as well as iconographic examples. They are also one of the least studied groups of plants from Bronze Age iconography. As with many motifs, there is debate over their identification in frescoes, yet a number of possible examples exist. The Birds and Monkeys frieze includes a plant Evans saw as a vetch or wild pea, the pods evident at the same time as the flowers (PM II.2: 454). Cameron agreed with this identification, and he also believed that the the small plant appearing alongside the large irises in the Amnisos paintings was a member of the vetch family (Cameron 1975: 100). An unpublished fragment from the Royal Road (South) excavations may be a vetch or sage plant (Cameron 1975: pl. 118A). Finally, fresco fragments

from Palaikastro have been reconstructed to show a vetch (MacGillivray *et al.* 1992: 128).

Ceramics show vetches more often than may be realised: ten examples were recorded by Marinatos from Akrotiri. As with the barley imagery, pottery with vetches is dark-on-light in style, and appears mostly on jugs or ewers (e.g. Thera II: pl. E3; Thera VII: pl. 44d) (fig. 247), although some examples are found on cups (Thera VI: pl. 73b), and there may be one instance of the motif on a rhyton (Thera IV: pl. 86). Comparable dark-on-light vetches come from Knossos: a fragment without context (PM II.2: fig. 276h), a large jar from the North West Treasury (PM II.2: fig. 277), and a jar from the South House (PM II.1: fig. 213). Apparently a plaster offering table from Hogarth's House features a vetch motif, but this remains unpublished (Cameron 1975: pl. 118b). The Unexplored Mansion also provided two sherds with vetches (Popham 1984: pl. 132e; pl. 138a, 138d). Walberg noted that the vetch appears in her Post-Kamares period, and not only is it a less popular motif than other plants like crocus or lily, but also later in date (Walberg 1992: 245). However, two Palaikastro examples from the MM III period show the plant in the earlier light-on-dark style (PM I: fig. 445a-b).

Vines

Vines do not feature in wall-paintings, although Cameron considered the plant from Ayia Irini with serrated leaves and red berries to be one example of *Vitis vinifera* in a fresco (Cameron 1975: 104). Ceramics also seem to lack the vine motif, with two possible exceptions from Akrotiri: a jug from the West House which features vetches, and, below the handle, a possible bunch of grapes (Thera VI: 33; Pl. 79a), and a dark-on-light ewer with grapes (fig. 248).

Fruit, nuts and trees

Other foods which are found in the palaeobotanic record include nuts such as almonds; these have not been identified in iconography. Legumes such as lentils and chickpeas also have not been identified in Bronze Age art. Faience replicas of fruit are reported from Zakros, but no further details as to the species are provided (Platon 1985: 147), whereas a faience plum has been identified at Knossos (Foster 1979: 81), and palaeobotanical remains of *Prunus* were found in various contexts at Kommos (Shay and Shay 1995: Tables 4.10, 4.11). Fig traces have been recovered from the archaeological record too, and Morgan has suggested that the trees shown in the West House scene of the Assembly on the Hill may represent *Ficus* (Morgan 1988: 18) (fig. 196). Evans believed that the tree shown within an enclosure on a fragment of a steatite vase was a fig tree (PM II:

615; fig. 386), and although Younger does not include figs amongst his identifiable trees on seals, his Tree 5 is similar to these other examples (Younger 1988: 304). Charcoal remains of other trees also correspond to a certain degree with those found in frescoes. For example, olive trees are depicted and olive charcoal is one of the more common types recovered from Bronze Age sites (see Table 1.1). Pine and cypress charcoal correspond to wall-paintings also: the cypresses from Prasa (Cameron 1976: 7), and the pine trees from the West House miniature frieze, where they are dotted along the hill-tops (Morgan 1988: 18). A possible fragment of a pine nut may also have been identified at Akrotiri (Sarpaki 2000b: 667). Finally, pomegranates must be mentioned, as although they have not yet been found in palaeobotanic contexts from Crete, quantities of them were recovered from the Ulu Burun shipwreck (Haldane 1993: 352), and they are also recognised iconographically, e.g. the bone pomegranate flowers from the Temple Repositories at Knossos (fig. 126), and a pomegranate vase from Phaistos (PM I: fig. 354b; Levi 1976: pl. 180f).

Reeds

Finally, although not used as food, reeds are another economically important plant for which both iconographic and palaeobotanic evidence survives. Impressions of reeds have been recovered from a number of sites, including Debla, Mochlos, and Myrtos Fournou Korifi (see Table 1.1). Akrotiri also provided remains of *Arundo donax* (Sarpaki 2000b: 667). Often condensed into a generic category of 'reeds/grasses', such plants actually are one of the more widespread motifs from the Bronze Age Mediterranean. Examples have turned up in wall-paintings at both Alalakh (Woolley 1955: 231; pl. XXXVIII) and Tell el-Dab'a (Bietak 1995: 24). Fragments from Phaistos, Zakros and Palaikastro show reeds, and they feature in the marsh landscape from Katsamba and Ayia Irini. Knossian frescoes include reeds or grasses too, and at Akrotiri not only do they appear in the West House miniature frieze, but also constitute the subject matter of an entire largescale fresco (Vlachopoulos 2000) (fig. 249). Reeds or grasses make regular appearances on ceramics, from Kamares ware through to the Floral style of LM Ib palatial tradition (Vlachopoulos 2000: 646-653).

Thus it can be seen that while most iconographic analysis has tended to focus on non-food crop plants, other palaeobotanically visible species occur in Bronze Age art alongside the better studied lilies and crocuses. Needless to say, the distinction made here between these crop plants and the other non-food plants may well be totally artificial and divorced from a Minoan hermeneutic. Furthermore, just because a plant provides food does not exclude it having other meanings and

uses, as was demonstrated in chapter three. Rackham declared that the plants in Minoan art "reflect a taste for gardening and travel rather than an interest in field crops or the native vegetation" (Rackham 1978: 758). Yet olive, grain, and vetches do appear, although vines are much less popular. It is interesting to note that such food species seem to be more common as motifs on ceramics as opposed to in wall-paintings. This may be useful to bear in mind when considering the function of wall-paintings; they may be situated beyond the real world, where bodily nourishment is not a key concern. Moreover, the representation of food plants on ceramics in greater numbers may somehow be linked to the contents of the vessels. This field will hopefully be explored further in the near future.

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