The Cosmos in Ancient Greek Religious Experience

Sacred Space, Memory, and Cognition

Efrosyni Boutsikas

THE COSMOS IN ANCIENT GREEK RELIGIOUS EXPERIENCE

In this book, Efrosyni Boutsikas shows that ancient Greek religious performances were intricately orchestrated displays comprising topography, architecture, space, cult, and myth. These various elements were unified in ways that integrated the body within cosmic space and made the sacred extraordinary. Boutsikas also explores how natural light or the night sky may have assisted in intensifying the experience of these rituals, and how they may have determined ancient perceptions of the cosmos. The author's digital and virtual reconstructions of ancient skyscapes and religious structures during such occurrences unveil a deeper understanding of the importance of time and place in religious experience. She illustrates how they shaped the emotions, cosmological beliefs, and ritual memory of the participants. Her study revolutionises our understanding of ancient emotionality and cognitive experience, demonstrating how Greek religious spaces were vibrant arenas of shared experiences of the cosmos.

Efrosyni Boutsikas is Senior Lecturer in Classical Archaeology at the University of Kent.

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SACRED SPACE, MEMORY, AND COGNITION

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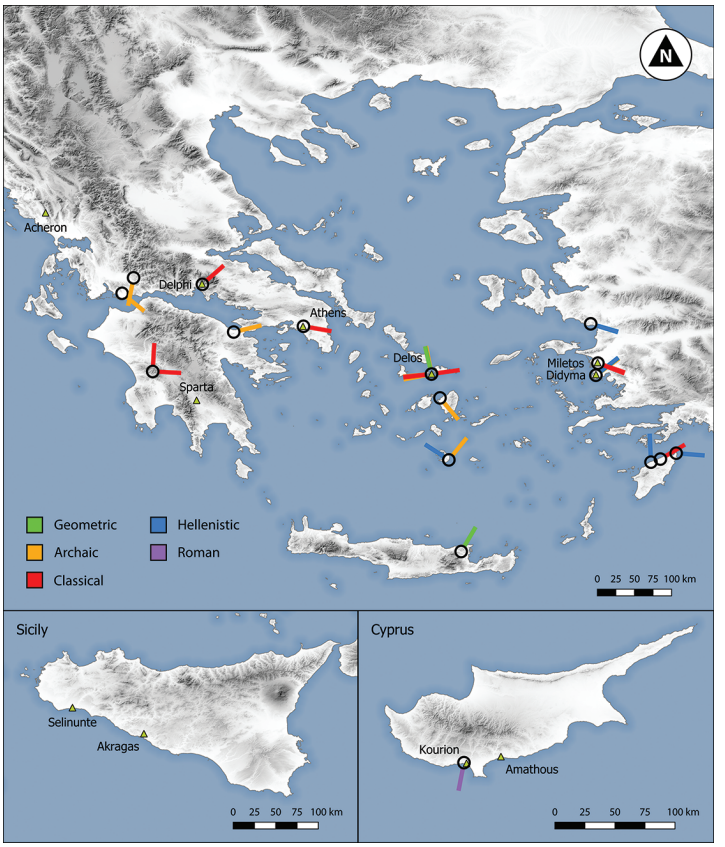

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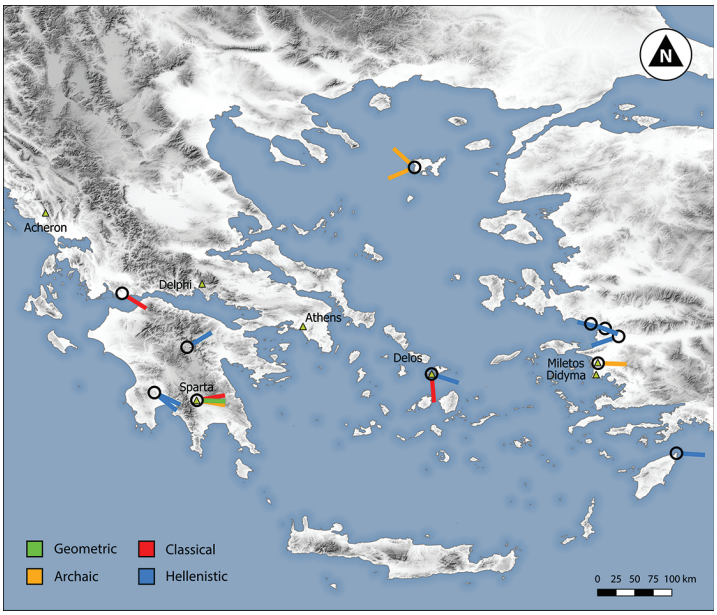

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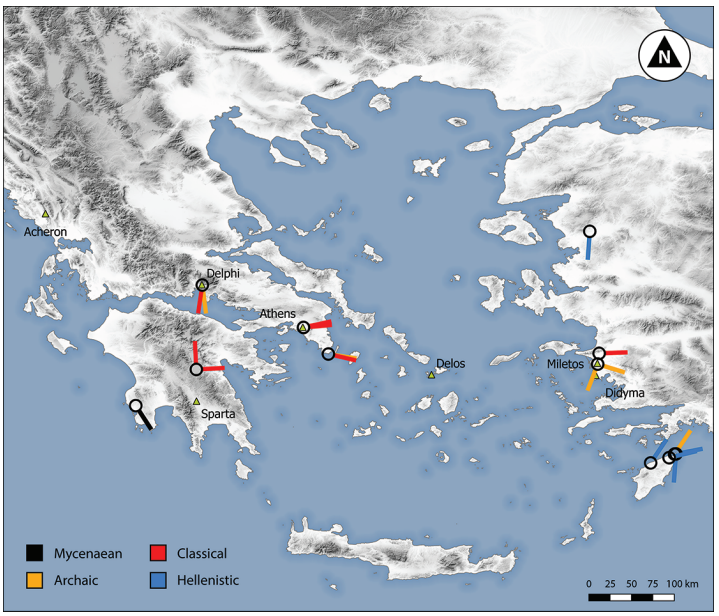

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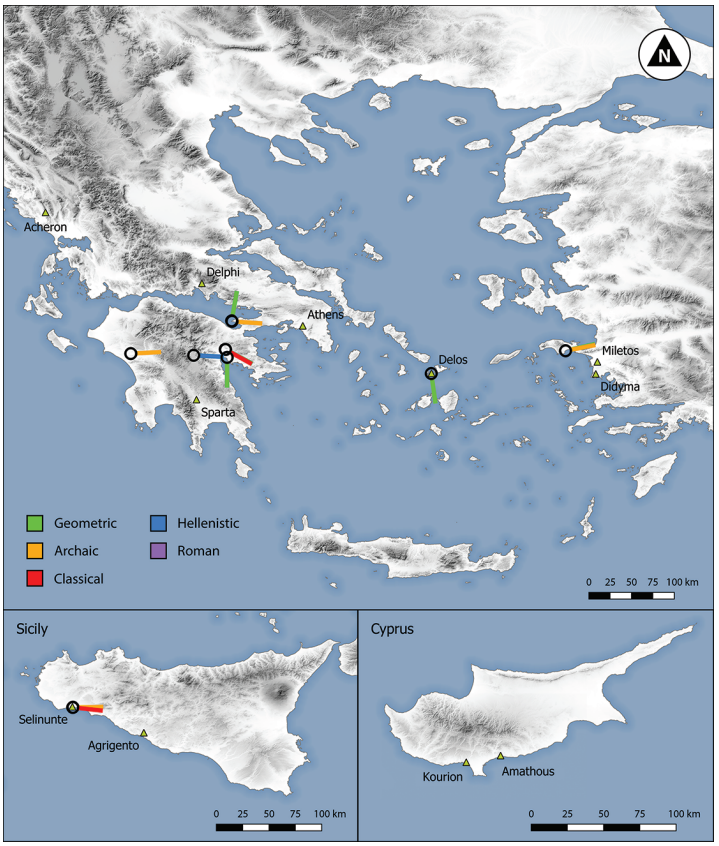

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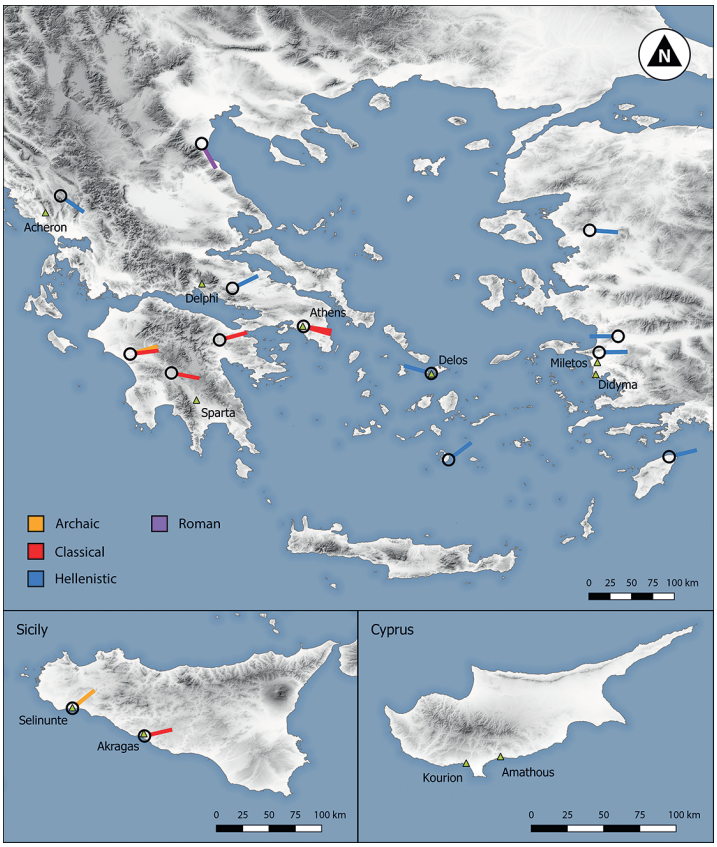

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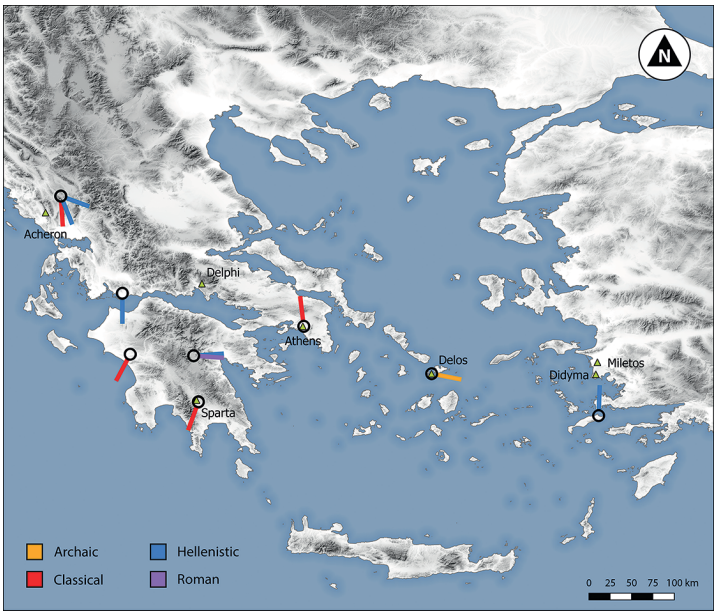

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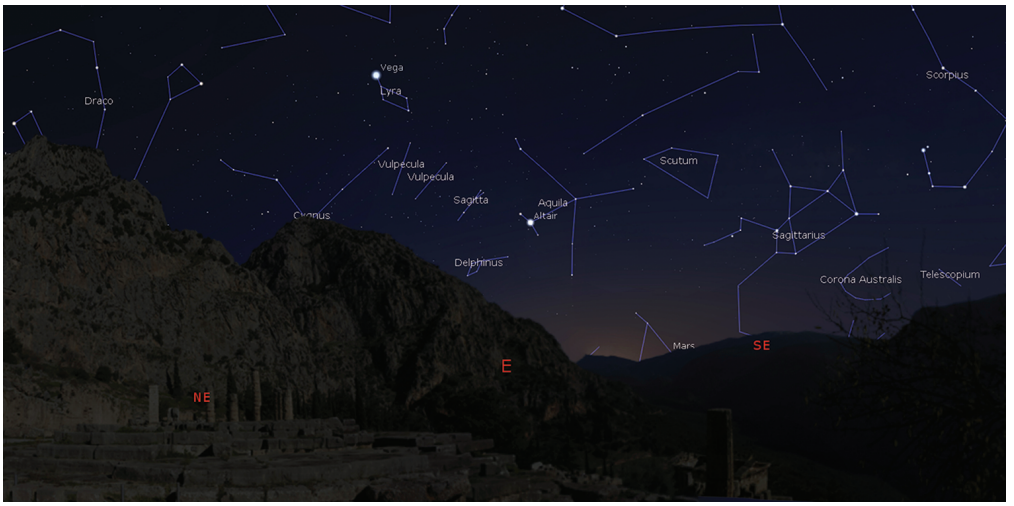

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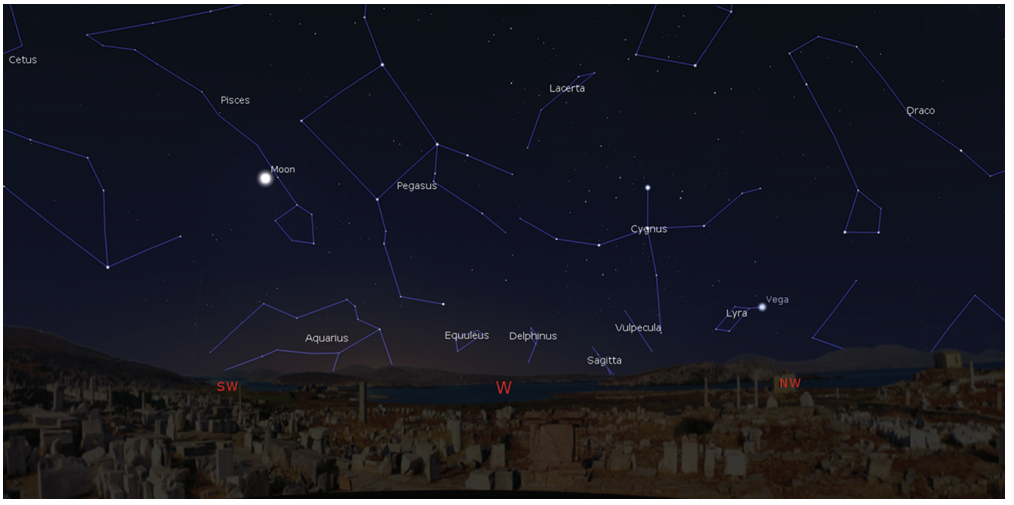

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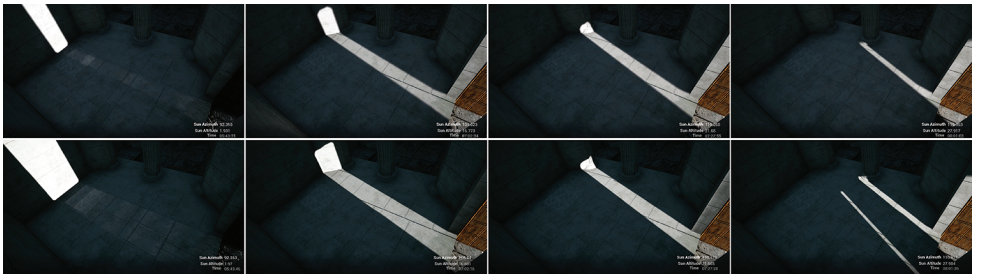

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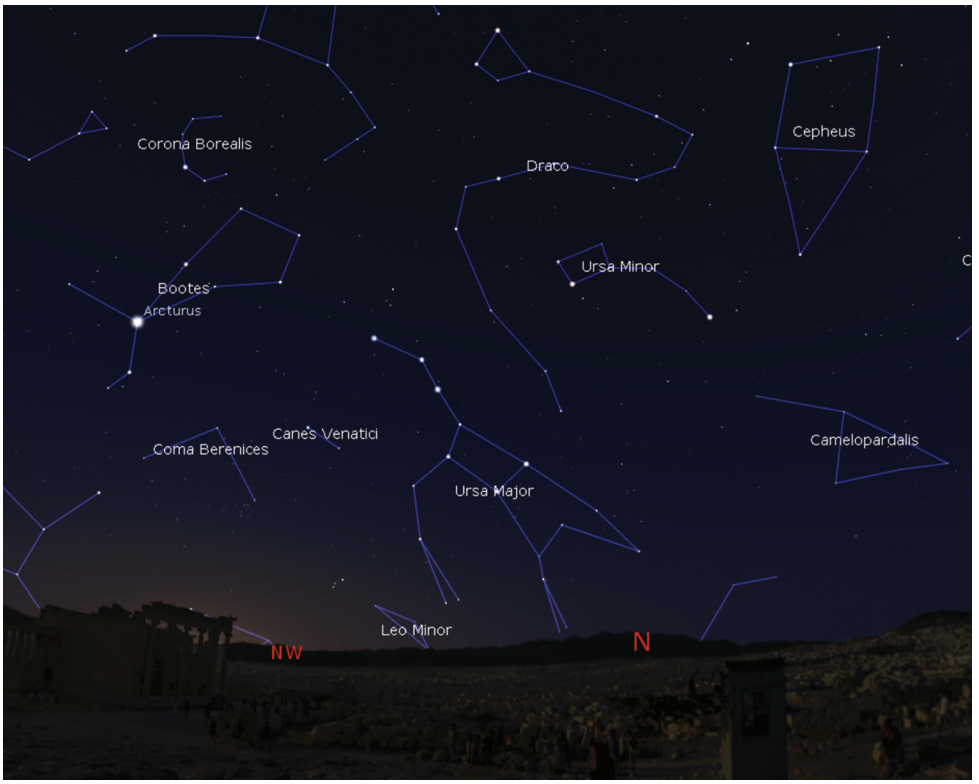

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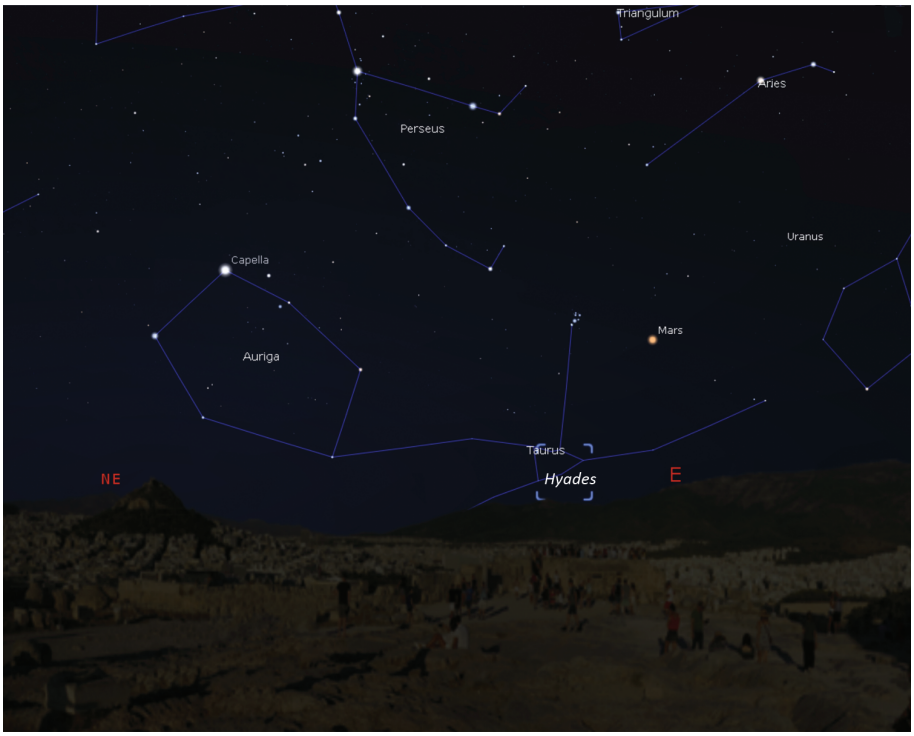

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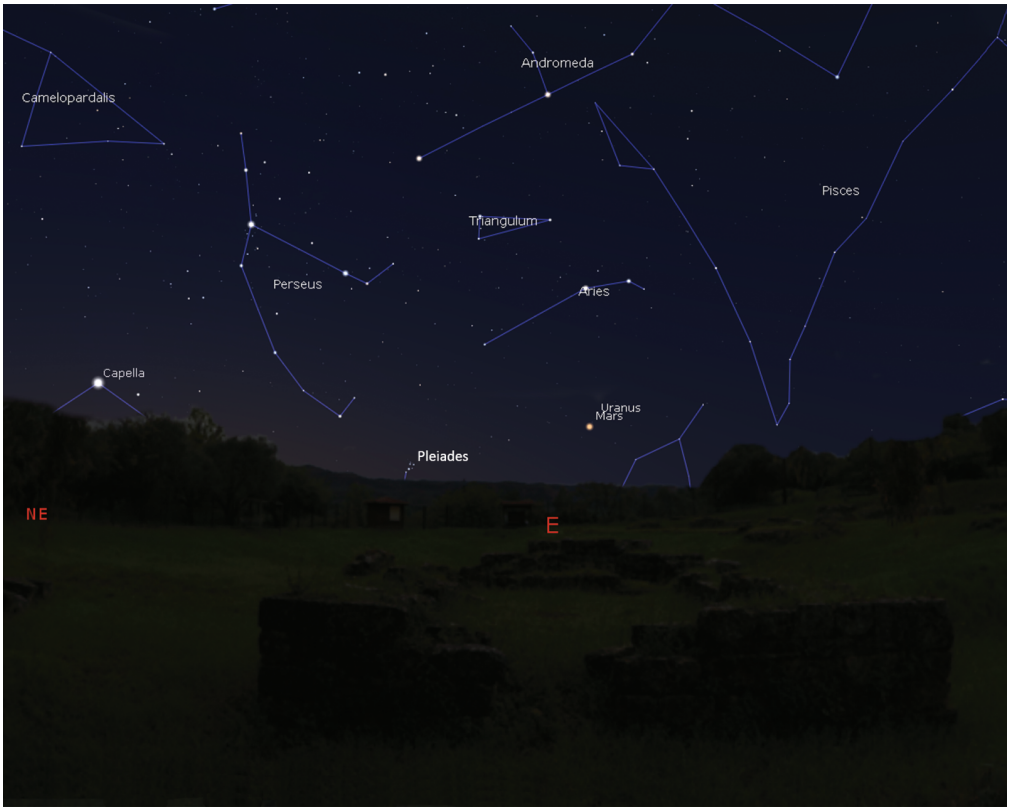

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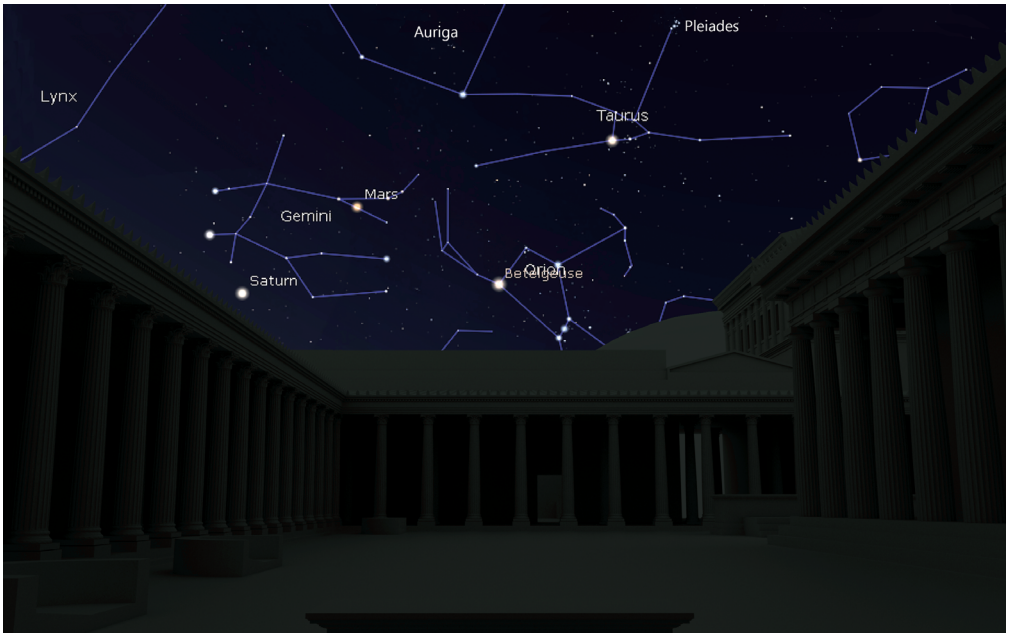

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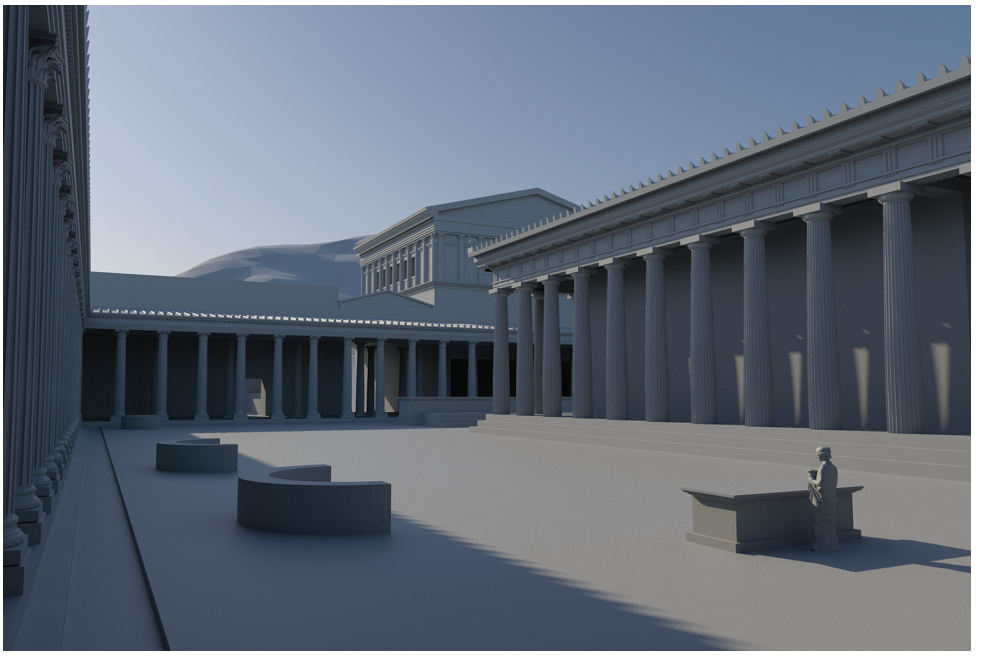

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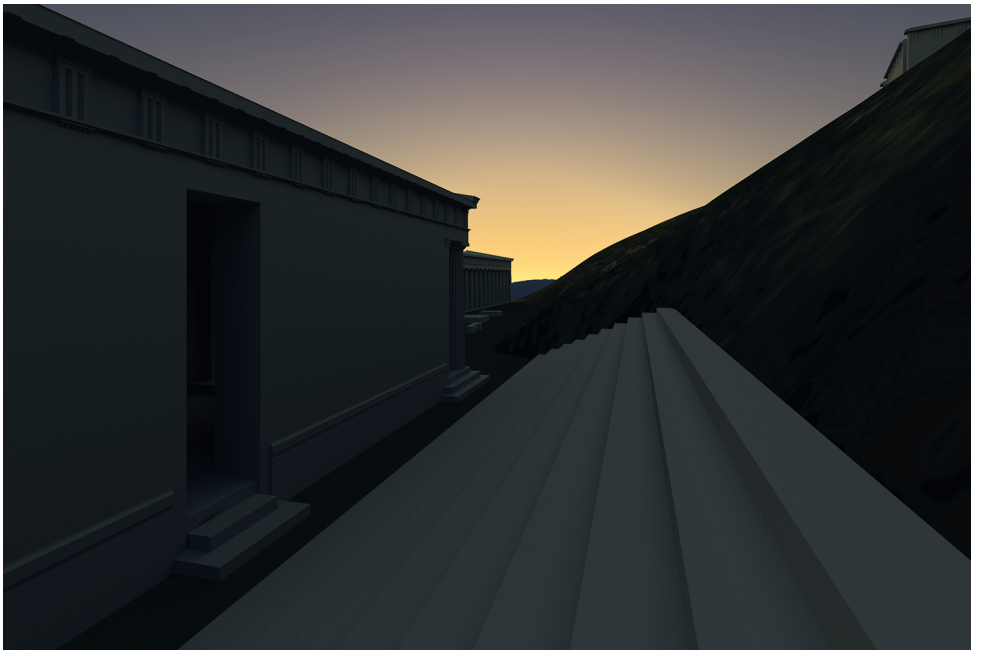

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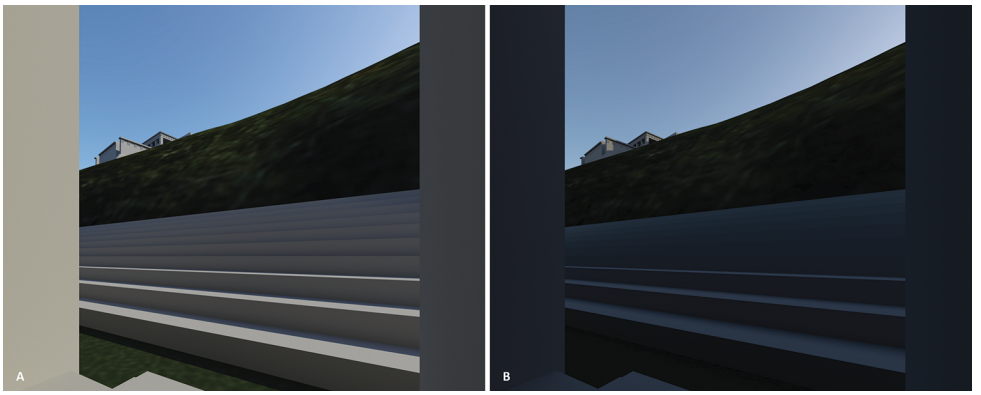

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ONE

INTRODUCTION

Unthinkable as it may be for most modern city-dwellers, one glimpse of a truly dark night sky is simply captivating. Our daily immersion in light-polluted, densely constructed cities has resulted in our detachment from the night sky and open horizon views. This detachment has inevitably also influenced the way we approach ancient cultures the world over. Because we do not think of the night sky, we assume the ancients did not either. And although much has been written and theorised about ancient landscapes, space, and movement, such studies almost exclusively concern these concepts as experienced in the light of day, bypassing in this way a significant portion of ancient lives and experience. In our scholarly endeavours, we forget that darkness and light amplify in different ways the experience, perception, and impression of a place or event, optically altering colours, textures, figures, spaces, landscapes, and structures.[1] The effect that pockets of artificial light in dark spaces have of tightening participants' physical proximity during nocturnal performances, for example, has been demonstrated in recent research in cultural geography. Such use of light not only brings people physically closer, but naturally also affects experience.[2] In modern theoretical and empirical studies of the Classical (and particularly the Greek) world, though, investigations engaging with ritual experience and spatial movement tend to assume seasonless, diurnal conditions, despite recent efforts to stress the inseparability of time and space – in other words, the importance of the chronotope[3] – in human cognition, experience, and memory. And in this way, we so effortlessly

bypass approximately half of the daily twenty-four-hour cycle and, consequently, a significant portion of human experience, encounters, memories, and interpretations.[4] In other disciplines, work on nightscapes has emerged as an awakening of what we have been so far leaving out in relation to embodied practice and affect.[5] Yet the study of the Classical world stubbornly resists.

Our approach to past cultures is additionally undermined by modern inability to measure time empirically. Our detachment from the night sky, and thus from time measurement, predetermines our perception of timekeeping as something completely external to and detached from daily life. Yet the concept of time as an 'abstract entity' is an idea inherently modern.[6] And so our sincere and painstaking efforts to interpret and understand ancient Greek culture have traditionally ignored the most impressive cognitive artefact at our disposal: the canopy of stars in the night sky.[7] It is considerably paradoxical that whereas on one hand, we acknowledge the importance of the cosmic tripartite structure of earth, sky, and underworld in ancient Greek conception, one-third of this structure is almost wholly absent in studies of ancient Greek culture and particularly in studies of Greek religion. If we aim to understand ancient world views, should we not also attempt to incorporate the 'totality of the [ancient] perceived environment'?[8] The night sky is present in ancient Greek literature and art as far back as the Homeric epics, not least because human existence relied on time measurement,[9] rendering astronomical observations part of daily life. The presence of astronomical devices such as sundials and *parapegmata* in public and religious sites attests to the inseparability of the sky from daily and religious life. By the first century CE, astronomical knowledge was considered so important that even poetry could not be understood without it, because poets so often defined time (and beauty) through reference to the rising and setting of stars.[10] Poetry is not alone in this. Ancient Greek prose made just as an extensive use of astronomy. We are informed, for example, that the Peloponnesian wall was completed at the time of the rising of Arktouros,[11] and we observe that astronomy contributed a great deal to medicine.[12] Thus, when Sophokles referred to the morning (heliacal) rising of Arktouros as a signal for the arrival of time to move the flocks to winter pastures,[13] for example, he could not have assumed knowledge not understood by his audience. The change of seasons was monitored in ancient Greece (as in many other ancient cultures) through the movement of the stars.

These observations recorded the movement of the sun and stars. The ancient Greek night sky was populated in its entirety by the most significant Greek heroes, gods, and monsters, weaving an entire mantle of creation and aetiological stories. The Greek cosmos involved real and imagined things, and the night sky, with its ever-present mythological narratives, comprised for the Greeks an extension of their culture (its history, ancestors, gods, mythical monsters, even objects) and thus part of who they were. The ever-revolving

celestial dome, whether dark or bright, with its stars, planets, comets, eclipses, risings, and settings, which engulfed and whirled around human existence, gave the impression of a living entity.

Myths as collective narratives, particularly those tightly connected to ritual and religion, lend us valuable insights into ancient Greek cognition.[14] Eric Csapo very aptly expressed the value of these stories to our understanding: 'So long as myth is a collective narrative by definition, the only relevant considerations are the mentality and purposes of the society for which the myth is a myth.'[15] Star myths in particular are not simply of value to our aspiration to *decode* ancient cognition, but, as this book demonstrates, they were of equal cognitive value to the ancient Greeks for the information they conveyed and their impact on ritual experience.

The relationship between astronomy and religion is much deeper than it may appear at first. Religion offers an understanding of the cosmos. In past societies, religion also facilitated insight into the mechanics of the cosmos. It structured the universe and man's place within it. Through human activities taking place on earth, past cultures projected the significance of their actions onto the totality of the universe.[16] Religion and myths provided the framework for this in ancient Greek culture. The tight connection between divinity and time was established early in Greek thinking. Diogenes Laertius states that the sixth-century pre-Socratic philosopher Pherekydes wrote in his book that Zeus, Chronos (Time), and Chthonia (later named Ge) always existed.[17] In the next surviving line of the same fragment, Diogenes gives us another piece of information: he speaks of a solstice marker in Syros (Pherekydes' native island), a cave, which according to Diogenes was used by Pherekydes as a device for marking the point at which the sun turned during the solstices. Diogenes was writing several centuries after Pherekydes, so whether the philosopher did indeed use the cave can be debated, but we know of other such natural 'solstice markers' as time-measuring devices (e.g., in the Cretan Itanos in the fourth century BCE).[18] The importance of astronomical timekeeping in human existence is explicitly discussed by Plato, who reminds us that the welfare of ancient Greek cities relied on knowledge of the heavens: the revolutions of the stars, sun, and moon; the arrangement of time into days, months, seasons, years. According to Plato, this is important 'in order that seasons and sacrifices and festivals may have their regular and natural order, and keep the city alive and awake, the Gods receiving the honours due to them, and men having a better understanding about them'.[19]

A number of other examples affirm this. The nocturnal character of several Greek religious festivals (Arrephoria, Eleusinian Mysteries, Thesmophoria, etc.), performed in open spaces with little artificial light, suggests the presence of the celestial dome encircling these performances, integrating the night sky into the cult experience. Direct links between religious festivals and

astronomical observations are made explicit in the earliest example of a Greek written *parapegma*,[20] dating to the early third century BCE. This is the P. Hibeh 27 papyrus, which recorded astronomical movements associated with religious festivals: to Athena at the acronychal rising of Lyra and when 'the sun is in the claws of Scorpio'; at the cosmical setting of Lyra, a festival to Prometheus; a feast to Apollo at the acronychal rising of the Pleiades, etc.[21] This is also one of the only two extant Greek *parapegmata* to link astronomical observations with religious occurrences. The other is the first-century-BCE Oxford *parapegma*, which lists four festivals.[22] The fundamental importance of astronomy and time measurement for coordinating religious festivals is also witnessed (as mentioned previously) in the numerous sundials excavated at Greek sanctuaries, such as the fourth-century-BCE sundial of the Amphiaraeion at Oropos,[23] the Hellenistic sundial of the sanctuary of Apollo in Klaros,[24] and that found in the vicinity of the theatre of Dionysos in Athens.[25] At the Oropos Amphiaraeion, time was measured using both a conical sundial and a very large water clock, the size of which has been marked as indicative of the importance of timekeeping at the sanctuary.[26] The close relationship between astronomy and religious occurrences is further confirmed by the well-known festival of Proerosia, also called Proarktouria (before the rising of Arktouros).[27]

Written sources provide the context for this intimate relationship between Greek religious practice and the night sky: accounts of watching the sky for divine signs as indicators to perform religious activities are common in a variety of texts. These can be meteorological signs, such as the arrival of Zeus at Thebes in the form of lightning.[28] But equally intriguing is the presence of more extensive nocturnal observational practices, such as that of the Pythaistai in Athens, documented from at least as early as the fourth century BCE,[29] who spent three days and nights in three consecutive months in anticipation of a divine sign to start the procession to Delphi (discussed in detail in Chapter 4).[30] Finally, the earliest and most striking example of an astronomical observation connected to religious practice is the reference to night sky watching in Keos for the arrival of Sirius' heliacal rising, which was followed by sacrifices to the Dog Star and Zeus.[31] The rite has been dated to at least the fourth century BCE.[32] The list of such occurrences discussed here is not exhaustive. Much more evidence testifies to the close relationship between ancient Greek religion, mythology, and skyscape. We will explore some further examples in the following chapters.

Pausing for a moment in order to reflect on the significance of what we have just discussed, it is worth contemplating that if the relationship between astronomy and religion is so strong and prevalent, is it not incongruous that modern studies of Greek religious practice do not consider the role of time and the night sky in ritual? It is the aim of this book to take advantage of the largely

unexplored field relating to the impact of ritual timing in order to demonstrate how productive it can prove in our venture to better understand concepts articulated through religious architecture and performance in ancient Greek culture.

ARCHAEOASTRONOMY – BOUNDARIES AND LIMITATIONS

As a term, archaeoastronomy describes the study of the sky in past societies.[33] Investigations of the ways in which astronomical observations were imbedded in the social and religious structure of past cultures have produced unique insights for our understanding of ancient beliefs and practices. In other cultures, archaeoastronomy has enriched and developed archaeological interpretations, particularly in relation to our understanding of ritual and timekeeping. The study of ancient skies has a unique advantage over other modes of enquiry: being able to create precise reconstructions of the night sky at any given moment allows us to piece together more accurately the environment and time of activities which took place in the open air, or which employed in some way natural light, darkness, or the visibility of a section of the celestial sphere. This means that archaeoastronomy can contribute towards the most accurate possible reconstruction of a past environment.[34] There is no hard boundary around the definition of archaeoastronomy. It concerns much more than structural orientations, and does not necessarily involve religious practices. A range of secular aspects of life involve astronomy, the study of which can also be viewed as archaeoastronomy. No type of human society can exist without at least a basic understanding of time. Pastoralism, agriculture, navigation, even hunting cannot be successfully performed without good knowledge of the seasons. The study of ancient astronomy allows us to reconstruct additional aspects of past life. Because of astronomy's close connection with human conceptions of the world and cognition about space and time, its study has the potential to bring us a step closer to understanding how ancient societies comprehended the world around them, and how they perceived and integrated their existence within the cosmos. This does not, however, mean that the study of astronomy can give us all the answers we lack about ancient cognition. The limitations which apply to archaeology also apply to archaeoastronomy.[35] Yet archaeoastronomy is a 'powerful tool for explanatory analysis'.[36]

Cultural context is essential in the development of theories concerned with cosmological and religious beliefs and practices. In the past, archaeoastronomical research on Greek culture has focused on drawing links between the orientation of temples and the sky. One of the main motivations behind celestial building alignments in other cultures was the attempt to harmonise a structure with the cosmos.[37] That Greek temples may have been orientated

towards certain landscape features or astronomical targets that may have been of significance to the group that constructed them is an interesting and, indeed, very plausible idea. But only through contextual approaches can we make a convincing case for the deliberate association of a man-made structure or a performance and an astronomical target. The field of archaeoastronomy has unveiled, in a number of cases, practices and correlations that would have not been otherwise recognised. One of the most striking such examples is perhaps the so-called Governor's Palace at the Mayan city of Uxmal, which is aligned with the southernmost rising point of Venus.[38] Yet this correlation would never have been recognised but for the presence of hundreds of Venus symbols carved on the building's façade.[39] Context serves to establish the intentionality and nature of the suggested correlations, which can help advance our narrative about the conditions under which these correlations had meaning. In relation to ancient Greek ritual practice, archaeoastronomy has the potential to enrich understanding of ancient Greek religion. The danger of overemphasising the role of the sky in these practices is a trap earlier research has certainly fallen into. Astronomical links may be present, and they may indeed have the power to impress, but this does not exclude the possibility that these monuments or activities also conveyed other meanings or were important in other ways. A promising focus for a more articulate reconstruction of the ancient Greek ritual experience is one which includes temporal reconstruction and referents and incorporates them into spatial experience.

GREEK TIMEKEEPING

Ancient Greeks shared a common way of measuring time, which was based on lunar months regulated by the movement of the sun.[40] A new month commenced always on the new moon,[41] nominally producing months of twenty-nine or thirty days in length.[42] Uniformity of timekeeping did not exist though throughout the Greek space. City-states had their own month names, started their year at varying times,[43] and intercalated the extra month at a different time in the year. This complex nexus of timekeeping restricts our knowledge. The Athenian, Corinthian, Delphic, Theban, Macedonian, and Rhodian calendars are complete,[44] but this is in stark contrast to other cities. For instance, we miss three months from the Argive and Spartan calendars, we know only six months of the Theran and two months of the Tegean calendars, and we know only one from Arkadian Orchomenos.[45] This inconsistency in calendar documentation poses important limitations in terms of the case studies which can be included in this book. In order to faithfully recreate the times of the rituals we need not only the month names, but also to know the time of the year the month fell, and also the approximate part of the month a given

festival was celebrated. For a large number of festivals we lack at least one of these pointers, which means that only limited interpretations can be achieved.

There are 365.25 days in a solar year and 29.53 days in a lunar month, the period between one new moon and the next. This means that we will see roughly 12.4 lunar months in a year. In order to stay on track with the seasons, it is necessary to compensate for approximately one-third of a month difference between twelve lunar months and one solar year, resulting in the addition of an extra month roughly every two years. In addition, the viewing of the new moon was subject to local parameters, such as bad weather conditions or even political interests.[46] In Athens, this led to the concurrent use of a civic and a religious calendar. On a Panhellenic level, though, these complications were more intense, since apart from the civic and religious discrepancies regarding the beginning of the month in a city, there seems to have also existed a lack of agreement between city-states on the beginning and end of a month.[47] A further complication relates to modern timekeeping: the conversion of any calendar to our Gregorian calendar is fraught with the problem of cross-referencing various months back to a known calendar and then converting them into Gregorian dating. Effectively, this usually means the calibration of a calendar to its Athenian equivalent, before the conversion to the Gregorian calendar. It is thus not possible to pinpoint a given day in any ancient Greek calendar to within anything less than three weeks.[48]

The ancient Greeks did not rely solely on the luni-solar calendar for timekeeping, perhaps because of these complications. For farmers in particular, the movement of the stars was a more reliable and therefore a more important timekeeping method. The use of star risings and settings is documented much before the earliest known epigraphical evidence of the fifth-century *parapegmata*. Hesiod repeatedly refers to these observations as a means for farmers to identify the correct season, in order to perform the relevant agricultural activities.[49] These observations were not new at the time of Hesiod. We have already discussed references to similar sightings mentioned in Homer, for timekeeping and navigation. The *Works and Days* proves particularly revealing of the interaction between farmers and the night sky, in the same way as the Hibeh *parapegma* does for religious practice. These examples show us that, although each Greek city-state was a coherent religious community with its own local cults and calendrical arrangements,[50] a Panhellenic system of measuring time through stellar observations ran parallel to local calendars. This operated perhaps as additional means of keeping the local lunar calendars in season, given the importance of celebrating religious festivals at the same time every year.[51] The *parapegmata* are believed to have been the invention of Meton of Athens and Euktemon, who were the first to publicly display stelae of this type around 432 BCE,[52] but their use spread across the ancient Greek world. They have been found as far east as Miletos and as far west as Puteoli.

Although the earliest *parapegma* (Euktemon's) dates to the mid-fifth century BCE, it is believed that their invention was the result of a much earlier practice. Later sources are more explicit about the widespread use of stellar timekeeping, which may have indeed remained popular even down to the Roman period because of the difficulties and inaccuracies of the luni-solar calendars. In one short passage, Varro moves from stellar dates (*Dies primus est veris in aquario*) to calendar dates (*primi verni temporis ex a. d. VII id. Febr.*) and anachronistically disregards what was known in his time of the movements of the sun, the equinoxes, and the solstices, assuring us that, ultimately, the stars are what delimit the seasons.[53] Ovid, too, voices poetically what may in the past have been folk belief, that the crops are 'nourished by the stars'.[54]

We discussed at the beginning of the chapter the connection between astronomical observations, timekeeping, and religious practice. A further indication of the importance of time in the celebration of Greek festivals is the longest cycle of religious occurrences, the eight-year cycle (*enneateric*) festivals, which suggest a close link between astronomy and religion and, in the case of Sparta, the cosmological significance of the king's tenure. In Sparta the office of the kings was renewed every ninth year (thus, after the completion of a full eight-year cycle) by the ephors, but only after the stars had been consulted on a moonless night. If a shooting star was seen, the kings were immediately dismissed. This custom relates to the belief in the king's divine power and the connection between his behaviour and its effect on cosmic order.[55] This order was guaranteed by Zeus, the safekeeper of divine, and universal, order;[56] thus the Spartan kings held the priesthoods of Zeus Lakedaimon and Zeus Ouranios.[57] The kings were placed in office by Zeus and it was through this mechanism that the reaffirmation of the god for the appropriateness of the kings was sought. But this was not the only *enneateric* occurrence linking events of the microcosm to the macrocosm. A very similar renewal of kingship was sought in the same time length by King Minos, who ascended to the cave of Zeus to commune with the god.[58] The historical foundation of this mythical occurrence has been asserted in the Athenian custom of the sacrificial tribute of seven boys and seven girls sent to Crete, in the story of Theseus and the Minotaur.[59]

Enneateric (translating to every ninth year) occurrences have a solely astronomical resonance. The moon takes 9.3 years to move between standstills (from a major to a minor and vice versa). Consequently, it takes the moon, sun, and stars 18.6 years (i.e., one Metonic cycle) to return to the same place on the horizon and the same lunar phase (i.e., to repeat the same lunar phase at the same declination). If Thomson's assertion is correct that the historical attestation of this renewal was the performance of the crane dance at Apollo's Delian Horn altar, imitating the windings of the labyrinth,[60] and that this was performed during Apollo's festival on the seventh of Thargelion,[61] the

occurrence would have taken place in late May–early June, close to the summer solstice. The *enneateric* periods, which included two of the more common four-yearly festivals (*penteteris*), are attested from at least as early as the Archaic period.[62] Since *enneateric* occurrences had a renewing character, they are a good example of how culturally inapt our modern concept of annual renewal celebrated every 'New Year' is to describe ancient Greek perceptions of time. These ancient eight-year occurrences are an excellent paradigm of the inseparability between the microcosm and the macrocosm in ancient Greek cognition.

RESEARCH AIMS AND CONTEXT

It has been acknowledged elsewhere that, helpful as it was at the time of its conception, the idea of 'polis religion' is not sufficient to encompass a full understanding of the impact of religious practice in the formation of identities.[63] The model of creating self-sustained categories under the umbrella term of 'Greek religion' (e.g., *genos*, polis, Panhellenic) can assist our understanding of the specific functions of cults falling within these categories, but being an artificially devised mechanism created by twentieth-century scholars trying to make sense of Greek religious practice, this model does not reflect the ancient reality of how the Greek religious system operated and was comprehended by its members. This is easily exemplified by the category of mystery cults, which, although seemingly comprising a well-defined group of cults, in fact also encompasses a number of other groups, such as polis, Panhellenic, etc. Mystery cults did involve a different level of religious experience, aims, and identity, but this would have been concurrent with other religious experiences and identities. It is then more helpful, as Esther Eidinow proposes (without refuting the importance of the role of the polis), to think of Greek religion as comprising of 'sets of nodes linked by multiple ties'.[64]

Although not all myths are based on ritual, they can be tightly connected to religious rituals. The alternate reality and the world beyond reason created in myth perfectly suits the world constructed by ritual. Both employ imagination and emotionality. Ritual is approached in this book specifically and solely from the angle of religious rituals. Our knowledge of Greek ritual is pieced together from references in the written sources, iconography, theatrical plays, and the narration of tales – myths. The fears, anxieties, and hopes expressed in myths, the results of relationships between humans and gods, give us an idea about the ways and terms according to which such relationships would have been maintained. The division between myth and ritual is clear.[65] Myth can exist without ritual and vice versa, though in the case studies presented here, myth and ritual are interlinked. Ritual and myths comprise an essential corpus of evidence attesting to how ancient Greek groups envisaged themselves. These

virtual images incorporated various degrees of identity, maintained through the construction of an entire culture out of memory, achieved in different ways for every polis.[66] Ancient Greek myths were drawn from memory – more so during ritual performance. Because memory is the essence which shapes history and culture, it is essential to explore recent advances in our understanding of the mechanics of memory. We will explore this topic in detail in Chapter 2. In this book, I investigate how the selected rituals assisted in remembrance and how they presented or emphasised their (polis-) specific links with cosmic order. Mystery and Panhellenic cults require a slightly different approach, because they transgress civic identity. Their emphasis is not so much on the collective polis identity, but instead on the specific cult's links with cosmic order. It is, of course, acknowledged that other methodological approaches, such as landscape analysis or art and iconography, can also address aspects of the cultural significance of memory and experience, but the intention of this book is to investigate how astronomy and the selected temporal setting in particular can help us address these aims. This is because this study aims to better understand experience within the temporal context in which it was created. This aim can only be achieved if we approach rituals in their given temporal framework and within the totality of their environment, which includes this temporal and topographical setting.

The chronological scope of the work presented here is the seventh to the first centuries BCE, and its geographical span is mainland Greece, the Greek islands, Asia Minor, and to a lesser degree Sicily and Cyprus. Surveys of sites and structures have been carried out for all these regions and they are presented in Chapter 3. Because of the volume of this material, though, it has not been possible to provide a detailed analysis of each of the 240 orientations included in the current data set. Instead, certain key sites and structures have been selected for in-depth analysis, which will provide the groundwork for future work and for testing ideas presented here. My investigation begins with a survey of earlier studies theorising the role of astronomy in ancient Greek religion and moves to re-examine these arguments. This analysis confirms that sweeping approaches are not apt to progress our understanding of Greek religious practice, not least because of the impact of local traditions which shaped local religious practices. These local facets were imbedded in cult practice, temple construction, and mythology. They contained local memories of the past shared within the particular group. Chapter 3 confirms this idea from an archaeoastronomical perspective, while Chapters 4–6 are dedicated to individual cults and sanctuaries as examples of how myth, the night sky, and astronomical observations may have been incorporated into the ritual experience and religious timekeeping.

Great progress has been made in the past few decades towards deciphering ancient cosmological principles. What still eludes us is a rigorous and

multifaceted methodology for understanding the enactment and communication of cosmological and religious concepts through ritual.[67] The ability of religion and ritual to permeate various aspects of life and to be present in various contexts means that only through a multifaceted and blended approach can we be successful in comprehending ancient cosmological concepts and religious experience. The chapters which follow start from this premise with the intention of establishing such a methodology. The present work offers a close encounter with ancient Greek experience of the cosmos in ritual. It does not aim to create detailed environmental reconstructions. Such an attempt would allow fewer case studies and reconstructions in order for relevant bioarchaeological and environmental data to be also included. The current study offers a novel level of analysis, better equipped to interpret ancient Greek experience of nocturnal festivals, and in turn better equipped to contribute to an understanding of the multiple processes encompassed in the operation and perception of sanctuaries by their users.

It has been argued that humans experience the built environment mostly through movement and visibility, and in turn, the built environment reflects the cognitive constructs of its users.[68] The layout of a sanctuary, the plan of a temple, and the positioning of an altar reflect the needs of their users and the types of activities these structures were associated with. This study employs 'middle level' spatial analysis.[69] It considers how temples functioned within the setting of the sanctuary, the approach, and their orientation, but extends also beyond the terrestrial landscape to include the skyscape within which the structures are situated. This inclusion is of particular relevance to 'middle level' analysis, as it reveals the complex relationship between architecture, space, and experience. It is not possible to understand how individuals interacted with or experienced the sanctuaries and rituals unless we consider the defining temporal and spatial aspects of this interaction. Earlier research has acknowledged the need for a more contextual approach, most notably for Panhellenic sanctuaries, where analysis involves a study of cognitive interactions and processes such as those affected by the purpose of the visit, for example, or the types of visitors a sanctuary attracted.[70] Yet the temporality of these visits, which so influences the experience of a space, is still to this day ignored.

This work does not claim to reconstruct a single, universal ancient experience of the examined rituals. As we will discuss in Chapter 2, such an endeavour would be a futile task, since there can be no singular experience, collective or individual. Instead, the aim is to inform current knowledge of the totality of connotations present during these performances in order to better discern the conditions which shaped ancient experience of festivals, so that they, in turn, may help us identify the factors influencing and determining ancient Greek understanding of the cosmos. This includes the ways in which night, darkness, and illumination may have assisted in intensifying ritual

experience. We know, for example, that the human sensorium is readjusted under darker conditions, while the senses become more alert in order to deal with movement and awareness of surroundings.[71] The study of the time during which rituals were performed is thus one of the most directly accessible conditions we have to inform us of ancient experience.

TWO

METHODOLOGICAL ADVANCES, APPROACHES, AND CONSIDERATIONS

TEMPLES AND ALIGNMENTS: PAST APPROACHES AND METHODOLOGIES

In recent years, the study of ancient ritual experience and the role of emotions has become a subject of intense research.[1] It is now somewhat a scholarly cliché that experience of a space is influenced by architecture and movement. Of equal importance to this experience, though, is time (day, night, and the seasons). The aspect of time – or, in more general terms, the inclusion of the *total environment* – has received, as we discussed in Chapter 1, very little attention in the study of ancient Greek ritual. The three components comprising the *total physical environment* (land, sky, time) are equally critical in shaping memories and experience. Previous studies have traditionally focused on a combination of these components, but hardly on all three.[2] Just as the study of landscape or architecture alone cannot inform us of experience, a sole focus on the time when rituals took place, or indeed only on the orientation of the architecture in space, cannot be sufficient to enrich our narrative. It is now accepted that cognition is to be understood as 'embedded in its surroundings', not as a detached system.[3] Thus a combined study of external elements and internal processes has the potential for a far better understanding of ancient cognition.

Re-examination of earlier methodologies and research on the role of astronomical targets in the orientation of religious architecture can assist in

suggesting ways in which we can develop robust and methodologically sound cognitive interpretations of the role of astronomy in Greek religious practice and perceptions of the cosmos. As successful applications of archaeoastronomy in other cultural contexts have demonstrated, archaeoastronomy in Greece has the potential to achieve a successful transition from decontextualised 'alignment studies' to an integrated study which considers orientation data, but only as one aspect of the range of available archaeological and historical evidence.

In the nineteenth century, ideas about the importance of the precise placement of temples were ignored by archaeologists, although without being extensively critiqued. These theories argued (much like concurrent archaeoastronomical research on Egyptian temples) that light from the sun on a particular day of the year would enter through the temple doors (aligned accordingly, towards the specific sunrise), penetrate into the temple *adyton*, and illuminate the cult statue – this moment marking the climax of the religious festival.[4] If this idea could be verified, we could indeed construct a theory of the importance of astronomical occurrences in religious experience. Yet, as we will see in more detail in Chapter 3, there are a number of inherent problems with this theory. The most evident is that such an interpretation overlooks the existence of windows, roof openings, and side entrances, which were present in a large number of Greek temples. Although *sekoi* may have been half-shrouded in darkness to increase the element of mystery, they must have been sufficiently illuminated for the sculptures and wall paintings to be visible and appreciated.[5] Wall and roof openings are present in temple architecture from as early as the eighth century BCE. Such features rarely survive and thus only a very small number of Greek temples can provide definitive evidence of their presence. Windows were known to have existed, for example, in the apsidal temple of Hera in Perachora (as attested by the clay model), the first Heraion of Samos, the temple of the Athenians in Delos, the Erechtheion, and the Parthenon.[6] The idea of adequate interior illumination is further supported by the pool of water surrounding Athena's chryselephantine statue in the Parthenon. Its functional use aside,[7] the water would have created reflections of and on the cult statue, enhancing visitor experience. It follows that if light–shadow effects were indeed employed in order to enhance ancient Greek religious experience, they did not rely solely on the precise orientation of the temple's main entrance. Research concerning the ratio of the temple openings in relation to the size of the structure can inform us about the amount of light entering the structure, as well as the areas towards which the light would have been directed.[8]

It is thus possible to identify the more visible areas of temples and their function. The *adyton* of a temple, for instance, usually separated from the *sekos* by a wall, would have received only a fraction of this light. The openings of the Erechtheion's west *sekos*, on the other hand, admitted an unusual amount

of light, making the structure brighter than the average fifth-century temple.[9] More effective illumination was provided by side entrances, another common feature (e.g., the temples of Apollo in Bassae and Athena Alea in Tegea), which allowed sunlight to enter the *sekos* and *adyton* from two different positions of approximately equal proportions, instead of the single point of the main entrance. In these cases, the orientation of the temple can convey important information about the amount and direction of light, as well as the times of the year when more or less light was admitted in the temple's interior. The temple of Alea in Tegea, for example, faces almost due east with a north-facing side entrance. This means that the temple could receive direct sunlight through its main entrance at dawn in the spring and autumn, and through its side entrance near the time of the summer solstice. The opposite effect is observed at the temple of Apollo in Bassae, a particularly interesting example of a structure that plays with light and shadow. We will examine this temple in detail in Chapter 4. It is important, though, to bear in mind that these observations are only relevant for diurnal visitor experience and only if the structures were visited during these specific times of the year. Yet, we know that this was not always the case. In fact, our knowledge of nocturnal festivals, paired with the presence of multi-nozzled oil lamps, such as those found at the sanctuaries of Akragas and Selinous,[10] confirms the nocturnal use of religious sites in ancient Greece.[11] Oil lamps supplemented the scarcity of light in the *sekos* and the innermost temple areas when visited after sunset.[12]

But let us revisit for a moment the argument of deliberate temple orientations. If the position of the rising sun on a specific date determined the orientation and, consequently, the axis of a temple, this is easily verifiable in two ways. First, this should mean that all, or at least almost all, Greek temples are oriented within the section of the horizon visited by the sun in its annual path. In Chapter 3 we will examine relevant data which will answer this question. Second, if this was the case, since the sun's position in the horizon changes daily, we could use the orientation of the temple to deduce the exact dates in the year when the festival was held. Moreover, we could even go as far as to deduce the exact date on which the foundations of the temples were laid. This latter idea was pursued by Francis Penrose, who proceeded to calculate putative dates of construction which contradict the range allowed by relevant archaeological and literary evidence (Table 2.1).[13] He arrived at a similar conclusion for those temple orientations which he associated with specific stars.[14] In the case of stellar associations, the rising of the star just before dawn (heliacal rising) was interpreted as a warning sign that the time was approaching when the rising sun would illuminate the temple's cult statue. This was argued to have provided the priests with the necessary forewarning in order to commence the preparations for the festival.[15]

TABLE 2.1. *Indicative examples of the dates Penrose deduced from his solar alignment method compared to archaeological dates*

Temple	Penrose's dates	Archaeological dates
Temple of Athena, Sounion	1125 BCE	Small: mid-sixth century BCE Large: mid-fifth century BCE
Heraion, Olympia	1300 BCE	ca. 600 BCE
Heraion, Argos	1760 BCE	Old: first half of seventh century BCE New: after 420 BCE
Temple of Olympian Zeus, Athens	1135 BCE	124–132 CE
Temple of Zeus, Olympia	760 BCE	470–456 BCE
Temple of Nemesis, Rhamnous	780 BCE	Early: ca. 480 BCE Later: ca. 450 BCE

But these interpretations cannot be supported by relevant evidence, or by what we know of the cults in question. Thanks to the phenomenon called axial precession, the argument of *precise* putative orientations on stellar targets is easily verified in sanctuaries with consecutive temple constructions. The paths the stars follow in the sky are not seen to change during one's lifetime, but shift considerably within a few centuries.[16] This means that Penrose's model would be verified only if the shift between consecutive temple orientations was identical with the direction and degrees of the shift in the position of the astronomical target in the years lapsing between temple phases. And since we know that ancient Greeks were aware of the effects of axial precession – traditionally believed to have been discovered by Hipparchos in the second century BCE[17] – the changes in temple orientation should follow the shift in the star's position even more faithfully from that date onwards. But the multitude of stars in the night sky make it impossible to build a convincing argument solely around the presence of a star which could follow this pattern, because this occurrence alone does not mean that this was a deliberate choice of the temple's builders. A more rigorous model is one which takes into account more contextual evidence, and which could thus support the idea of a deliberate astronomical association. Further problems with this model arise when considering the practical difficulties of the suggested observations, such as the height of the local horizon and atmospheric extinction and refraction, which affect the visibility of a star appearing just above the horizon. These effects can result in the delay of a rising star's visibility by a number of days.[18] It becomes clear then that identifying a particular star as the intended target on the basis of alignment alone can be misleading.

The source for a number of assumptions present in earlier approaches is a false sense of the need for overprecision when measuring structural

orientations. Penrose's work was distinctive in emphasising the need for extreme accuracy, quoting his orientation readings to the nearest minute of arc. Clive Ruggles has discussed extensively the three different concepts of overprecision, so a detailed discussion is redundant here.[19] In short, the extreme precision of our measurements as established by agreement between repeated measurements of the same thing; agreement between our measurement of a structural orientation and its actual value; and the precision of the original construction (for example, the degree to which a structure was actually aligned on (say) an astronomical target while still being considered or conceptualised as aligned on that target),[20] give the illusion of a guaranteed extreme accuracy in our interpretations. But the extreme precision of our measurements with greater accuracy than is valid for the circumstances does not translate to the cultural significance of the orientation operating at anything like this level of precision. Instead, what it does achieve is the assumption of discrepancies that are not present. As exemplified in Penrose's model, it is still possible to be overprecise and make 'dangerously ethnocentric assumptions'.[21]

A different but equally misleading type of false overprecision applied in earlier archaeological and archaeoastronomical approaches is that relating to the conversion of the ancient Greek calendar to our Gregorian. The timing of religious festivals was determined within the ancient Greek state calendar. Since, as we saw in Chapter 1, this was luni-solar, it cannot be fixed within the Gregorian year to better than three weeks.[22] Earlier approaches did not take this margin of error into account. Penrose, for example, deduced the date of the Niketeria festival (held on 2 Boedromion) to be 4 September. In fact, the festival could fall at any time from early to late September. He also converted the date of the Theseia (8 Pyanepsion) to 8–9 October. In reality, the festival took place between mid-October and early November.[23] Completing the circular argument, Heinrich Nissen used his temple orientation measurements to establish the timing of festivals. For the Heraion in Samos, for example, Nissen deduced that the festival was held in April or September.[24] Given the amount of assumptions involved in this inference (e.g., that temple foundations were aligned to the position of the rising sun on the day of the main festival; that the ancient Greeks were capable of achieving an extremely high degree of accuracy, i.e., within a few minutes of arc), it is clear that such an argument imposes modern, culturally determined inferences on ancient practice. But even if we were willing to overlook these assumptions, this theory cannot offer an explanation for the orientation of a large number of temples, which face outside the solar arc and cannot be thus linked to the movement of the sun. We will return to this in Chapter 3.

ASTRONOMICAL AND OBSERVATIONAL CONSIDERATIONS

The relationship between monuments and their land- and skyscape is examined in the case studies presented in this work. In addition, we pull together

archaeological material with historical and literary sources in order to provide the much-needed context for interpreting archaeoastronomical data.

The field data included in the following chapters comprise structural orientation measurements taken using a magnetic compass and clinometer. The magnetic readings were corrected to true azimuths by applying the relevant magnetic correction computed for the date and place of each survey.[25] This was necessary for comparing the various readings, since data collection was carried out over a number of years during which the magnetic correction changed. East corresponds to an azimuth of 90°, south to 180°, west to 270°, and north to 0° and 360°. The readings were taken along the surviving walls of the structures and as close to the foundations as possible. In order to minimise the chances of erroneous orientation measurements, multiple readings were taken for each structure (e.g., on either side of a wall and along more than one wall). In order to verify the accuracy of each measurement, a minimum of three readings (where there was agreement between readings) and maximum of five (until there was agreement between more than two readings) were recorded for each structure. The orientation of altars was determined by the part of the horizon the priest was facing at the time of making the offerings.

A compass, duly corrected for magnetic declination, gives a reading with an accuracy of ca. 1°, a level of accuracy considered sufficient for the purpose of this study. Ancient Greek technology could not have been more accurate than this instrument error. A number of researchers use total stations, which can provide orientation measurements with an accuracy of a few minutes of arc, but for the purposes of the analysis and the ideas discussed here, which do not argue for precise and direct alignments, such accuracy is not deemed necessary. In addition, accuracy higher than one degree of arc would exceed the accuracy of modern date conversions to the ancient Greek calendar and the accuracy that the ancient Greeks were able to achieve. It was not until after the time of Hipparchos (190–120 BCE) that improved *dioptra* were made. For his observations (and the composition of the first comprehensive star catalogue) Hipparchos used the armillary sphere,[26] which, again, would not be more precise than the error of the magnetic compass. Given that the compass is subject to magnetic anomalies, a number of precautions were taken for ensuring accuracy in the deduced orientations. First, geological maps of the sites were consulted in order to ensure absence of geological magnetic anomalies. The second level of verification included cross-checking of magnetic readings against a combination of methods, depending on optimal data available.[27] These included Google Earth and published orientation data by other researchers. Archaeological plans were also consulted, but these were found to be highly inaccurate, as in most cases the sign of north seemed to have been placed by approximation. For all but one of the sites included in this study, no magnetic anomalies and no systematic instrument error were detected. As a

result, the deduced declinations were based on the field-collected orientations. The only exceptions are the temples of Isis and Hypolympidia Aphrodite at the Sanctuary of Isis in Dion (Greece), where a metal bridge has been constructed in order to give access to the site, which is almost under water.[28] As a magnetic compass is useless in this environment, the orientations of these two temples were deduced based on Google Earth, using the compass only as a general guideline.

In order to investigate the existence of astronomical orientations, it is necessary to process the data by converting the azimuths and altitudes of horizon points into (astronomical) declinations. Declination is the angular distance between a celestial object and the celestial equator, an exact point in the celestial sphere (or horizon). The position of stars is given by their declinations, so the declination of a structure is the projection of the structure's axis on the celestial sphere. Any given star moves daily around a line of fixed declination, rising and setting every day at the same place (but at different time through the year). This means that by deducing the declination of a structure, we can tell which star would have passed through this point in the sky, risen, or set at this point in the horizon at a given date and time in the year. A structure's declination is calculated by taking into account its longitude, latitude, and azimuth and the altitude of the part of the horizon which is aligned with the structure.[29] Declination is preferred to the azimuth of a structure because we instantly account for atmospheric extinction and refraction, latitude, and the height of the local horizon, and because it is directly comparable to the positions of the stars. Typically, then, a given alignment is specified in terms of the azimuth (orientation clockwise from true north) and horizon altitude (vertical angle between the horizon in that direction and the plane of the observer) or the declination.[30] This is particularly important for the sites for which we know the time in the year or day/night when religious activities were held. In these cases, we can deduce a more complete reconstruction of what the participants of those rites would have seen in the sky and how the chosen time may have influenced religious experience.[31]

The sun, moon, and planets move faster than the stars because of their proximity to the earth. This means that their declination changes during the year. The declination of the sun varies over its annual cycle from $+23^\circ\ 45'$ on the June solstice (i.e., $23^\circ\ 45'$ north of the celestial equator) to $-23^\circ\ 45'$ on the December solstice (i.e., $23^\circ\ 45'$ south of the celestial equator). It rises and sets at about declination 0° (roughly east–west) at the equinoxes.[32] In the latitude of Greece, objects with a declination greater than ca. $+50^\circ$ are circumpolar (they never set), while those below a declination of ca. -50° are too far south to ever be seen.[33]

The atmosphere's turbulence when reflecting the light emitted by stars causes them to be seen as flickering or twinkling. This effect varies according to the brightness of the object. Planets, due to their size and proximity to earth,

are very bright and are rarely seen to have this effect. Faint stars can twinkle so much that they are rendered invisible. The time a star is best seen from earth (i.e., is most clearly visible in the night sky) depends on the height of the observer's local horizon. The smaller the angle between the observer's position and the star (i.e., the lower the star is in the horizon), the harder it is to see it. Above an angle of $+4^{\circ}$ in a flat horizon, the light of a star needs to get through a much thinner layer of atmosphere and is therefore reflected between atmospheric molecules less than a star that sits right above the horizon. This is again caused by the effect of the atmosphere. An exaggerated imitation of this effect can be easily experienced if we find ourselves in a dark place directly facing the light pollution of city lights in the distant horizon. Light pollution forms a band of light stretching along the lower part of the horizon. No stars are visible within this band of light and within several degrees above it. As our gaze ascends above the city lights, some few stars start to appear. These are the brightest stars which, because of their magnitude, are not completely obscured by light pollution. If we now look directly above our head, the number of visible stars increases. We can now see stars of different size and brightness. A similar, but much more subtle, effect on stars is caused by the atmosphere when they are approximately $+1^{\circ}$ to $+3^{\circ}$ above a relatively flat horizon in areas with no light pollution. As a result of the effect of the atmosphere's thickness, increased absorption, and electromagnetic radiation scattering, only the brightest stars are visible with the naked eye close to the horizon. If the city lights were obstructed by a hill, the light pollution would be only partially visible and dimmer, rising above the hill. The same is also the case with the effect of atmospheric refraction and extinction: the blurring of the stars caused by the atmosphere is hidden in a high horizon.[34] The declinations of the temples in this work account for the correction for atmospheric extinction and refraction, but this is not possible for the azimuths.

Astronomical observation requires relatively good vision, which would have been decisive if these observations were linked with nocturnal ritual experience. Darkness is a visual phenomenon. Human nocturnal vision relies on rods, a type of photosensitive but ultimately colour-blind cell in the retina, which are not particularly good at enabling the human eye to see in detail at night – particularly below 50 per cent of moonlight, when cones (the other photosensitive cells in the retina which facilitate daylight vision) switch off.[35] Our night vision is weaker and less sensitive to contrast, so when observing the heavens at night, under moonlight, sight is more or less greyscale.[36] On a moonless night, our rod system catches only a few photons (usually zero and rarely one at the starlight level and a few zeros and many ones at the moonlight level). At twilight, each of the rod system detectors catches several photons, resulting in a coarsely graded signal.[37] In essence, contrast (luminance discrimination) determines human vision.[38] The greater our sensitivity to contrast, the greater our ability to see and perceive objects in conditions of small

luminance.[39] The weakness of our night vision compared to the day means that: (a) more effort is required to observe distant objects at night; (b) the same things appear different; and, more interestingly, (c) things can acquire a fictional dimension 'as the retina gropes for sufficient wavelengths'.[40]

This last point is of particular relevance to our quest to understand the impact of nocturnal experience. Interestingly, vision and fantasies involve the same brain areas, with one difference: whereas in vision the signals proceed from the eye towards the cortex, in the formation of fantasies, the signals move from the brain towards the eyes.[41] It has been observed that during this process it appears that 'the information coming from the eyes is not sufficient to form a complete picture of the outside world. Our mind seems to fill the gaps left by optical systems.'[42] This means then that the brain is part of the human visual system, rendering vision as much a cognitive process as an optical one. Thus the optical information is converted into a consciously interpreted and experienced image of the world. But perception, it has been observed, 'is remarkable in keeping things appearing much the same in varying conditions';[43] observers will see what they expect. This also includes the appearance of colours in altering ambient light and sizes at varying distances, all of which seem to remain unchanged.[44] This is all the more so in a nocturnal setting, where what is *seen* is actually a combination of sight and fantasy, employed to fill the gaps left by human nocturnal vision. And, as we know, fantasy draws to a great extent on memory and experience. To appreciate the extent to which perception can alter what we see, it is worth briefly exploring what we think we see when we look at the moon. We describe the moon as having a 'silvery light' and even in overcast or misty conditions we will perceive it as a silver disk. Yet, an experiment carried out by Sir John Herschel which involved looking at the rising full moon at the same time as looking at a wall illuminated by the setting sun makes apparent that the moon is dark grey, not silver and not bright! The results of this experiment have been confirmed in the Apollo project, when the moon's reflection factor was measured to be almost the same as that of a cinder path.[45] Modern perception of the brightness and colour of the moon remains unchanged from that of the ancients. All this information is particularly relevant to investigations of the perceptions and experience of nocturnal performances. The night's shroud of mystery and darkness suited perfectly the mystic character of a number of ancient Greek cults, particularly those requiring initiation. Investigating how this darkness was manipulated in ancient Greek nocturnal rituals in order to enhance ritual experience is therefore an intriguing endeavour.

MEMORY AND EXPERIENCE

The inclusion of the total physical environment in the study of ancient Greek religious practice has the potential to contribute further to our understanding if

we incorporate also the non-physical elements of this setting: experience, memory, fantasy, and the senses. It is easy to understand how such an approach can achieve much more than a simple understanding of cosmological models, the level of astronomical knowledge and advancements, and timekeeping. Paradigms in other ancient cultures, most evidently in Mesoamerica, have demonstrated that ancient perceptions of the sky resonate deeply and richly throughout belief systems, cognition, and experience. World views are shaped and influenced by personal experience and memories, which assign specific meanings to objects, ideas, perceptions. Shared experiences and shared memories can lead to shared world views. And inevitably, an essential component of ancient world views was the sky.[46] The oral transmission of Greek myths associated with astronomical observations (katasterisms, the movement of the sun and moon, etc.) had a deeper impact than entertainment and education: they shaped and transferred an understanding of the cosmos. Helios travelled every day across the sky in his chariot and he rested upon the highest point of heaven until it was time to drive down again through heaven to Okeanos;[47] Selene's radiance emanating from her golden crown was at its brightest in the middle of the month, when she travelled across the sky on her chariot at full speed.[48] Day and Night drew near and greeted each other in Tartaros, as they passed 'the great bronze threshold', one descending downward into the house of the Night, the other coming out; one was always passing over the earth while the other was 'waiting until the hour of her journey arrives'.[49] There is a cognitive depth in such stories which is essential in understanding ancient Greek culture. An important aspect of the current study is therefore conceptualisation, a mechanism which through selection, reduction, and addition of stimuli from our surroundings allows us to make sense of the world.[50]

The Greek pantheon incorporates a number of divinities which express psychological or intellectual qualities, such as Metis and Pistis. Once deified, these qualities become greater than the human body that conditions them. Of these, Mnemosyne (Memory) belongs in a separate category. The deification of Memory is indicative of the value of remembrance in a culture heavily reliant on entirely oral traditions and histories, particularly in the pre-Classical times. The function of remembrance required for the Greeks divine intervention.[51] The occurrences where the poets ask for divine assistance or inspiration to recall and accurately narrate events of the past are countless. In this context, Mnemosyne's cosmological significance lies in that she is the deity who sings of the primeval past, of the beginnings of the cosmos. The cosmological significance of memory (as a function) can be witnessed also in its relationship with religion, in which context memory assists in locating 'human phenomena within a cosmic frame of reference'.[52] Memory has much to do with Forgetfulness (Lethe), another deified concept of the ancient Greeks. The

two divinities were associated at the oracle of Trophonios in Lebadeia, where the oracle seeker had to descend underground in a re-enactment of ritual dying through sensory deprivation.[53] During this process, he had to drink from the river of Lethe before his encounter with the Underworld in order to forget his human life, and then from the river of Mnemosyne on his return in order to remember what he had seen in the world of the dead.[54] In the context of the Underworld, and through her association with Lethe, Memory acquires an eschatological significance. She is responsible for the fate of souls; she presides over what is to be remembered in the successive reincarnations of souls, determining therefore the transformations occurring in each soul through this process.[55] The evolution of beliefs about Memory incorporated an understanding of the links between memory and the senses as exemplified in Aristotle's statement that we remember and perceive time through one and the same organ.[56] This link between memory and time ties remembrance to the sensory aspect of memory.

Memory could be perceived as a process of recreating patterns. It consists of mental images, which are neither invariable nor monolithic but which derive from the individual's mental division between what is the present and what is the past. The mutable, continuously evolving character of memory is primarily affected by factors like gender, age, identity, social status, ethnicity, time, etc. As a process, memory involves a number of complex cognitive operations. All these parameters cannot but result in as many versions of the memory of the same event and place as there are people in attendance. Even at the moment of encountering a new event, the encounter and memories are shaped by drawing links with other similar or dissimilar encounters.[57] It is understood that due to the way the human brain processes information, embodied memory will not be identical between individuals. Because our brain (biological memory) is active and prone to blending and interference, it cannot simply store information detached from experience in the manner that digital storage devices can. Any information stored in biological memory is processed information,[58] and so (re)activated information (memory) cannot be the same as earlier versions of the same memory. All this means that human cognition is embrained, embodied,[59] encultured, extended,[60] and distributed;[61] it should be understood as existing through an interplay of the whole complex of brain, body systems, and environment.[62] The idea of *extended cognition* is of particular relevance to this study. This involves the triggering of context-specific memories, especially in those cases where specific objects carry symbolic meaning. We discuss this further in the mystery cults explored in Chapter 6, but to briefly make this point clearer, the tokens received after initiation to the Samothracian Mysteries (a magnetised ring and a purple sash), for example, were not simple commemorations of initiation. The ring, in particular, identified those initiated, even after they had long left the sanctuary. Aside from its

status-identifier function, it operated also as a mnemonic stimulant capable of targeting individual, embodied memories of the initiation. This kind of remembrance can be a strictly personal process. Even in cases of collective remembering, the same event or object will retrieve different memories for different individuals.[63]

Armin Geertz sees the functioning human brain as inseparable from a 'supportive cultural trellis', since it has evolved within culture and has been designed to function within culture. It follows that trying to separate human cognition from culture is futile;[64] at the same time, cognition exists only because the brain and body exist. It is therefore not possible to consider ancient cognition independently of physical presence, experience, the senses, and a processing brain. The embodied cognition approach is essential to the study of ritual, since rituals are actions, interaction, and communication performed in specifically chosen locations at specific times and convey specific messages.[65] Let us not forget that remembering involves also forgetting. So individual brains will determine what information is to be retained and discarded. Memory is not tangible, singular, or homogenous. It is temporal, transcultural, and entangled.[66]

Having argued for the individuality of human memory, our aim is best served by interpretations which can be applicable at a group, rather than individual, level. In relation to group memory, much progress has been made since the seminal work of Maurice Halbwachs, which considered memory as a social artefact.[67] It is essential to first consider the two types of memory, as each stimulates different areas of the mind. So-called inscribed memory involves monuments, texts, and representations along with activities which are repetitive, prescriptive, formulaic, and materially visible.[68] On the other hand, embodied memory relates to how we recollect information on performances, behaviour, and activities through somatic markers.[69] Because ritual performance conveys and sustains memories and knowledge of the past, it is part of performative embodied memory.[70] Despite the fact that inscribed memory is easier to detect in the study of past societies thanks to its material substance, archaeological research has demonstrated that it is also possible to access performative memory through four categories of material evidence: 'ritual behaviours, narratives, objects and representations, and places'.[71] Some ritual performance is accessible through iconography, but can be quite speculative in the absence of written sources. Activities such as processions, the treatment of the dead,[72] feasting, votive deposition, processional ways, etc. can be particularly informative in our reconstructions of performances, as shown in research on prehistoric societies,[73] and more recently in reconstructions of processional movement in the Classical world.[74] In the context of ancient Greece, ancestral veneration, feasting, and deposition of votive offerings are in most cases associated with the act of remembrance. This is also the case for the majority

of religious festivals which include re-enactments of myths. These are examples of activities that celebrate memory and employ fantasy.[75]

The very use of the word memory, however, determines a distinction between past and present. The close ties between memory and forgetting, past and present, are evident in the common ancient Greek etymological root of memory (μνημοσύνη) and monument (μνῆμα/μνημεῖον), which exemplifies the importance of remembrance in monumental architecture. The process of remembering entails bringing to present consciousness things of the past through a process of retrieval. As has been noted elsewhere, this process is different to mental representation, in that remembrance 'represents the absent as past'.[76] Every recollection of the memory will also involve a cognitive shift between present and past. Thus every recollection has the potential to superpose and alter existing memories by replacing them with a newer interpretation.[77] The interpretations discussed in the following chapters do not assume that every individual witnessing the performances formulated, or that every individual remembered, identical experiences. It is acknowledged that different interpretations of the same mnemonic signifier can occur at any given moment, and that this can manifest itself in a number of ways. In the examples which follow, it would make little sense to attempt an investigation or comparison of the possible variations of individual memories, or indeed to attempt to compare individual to social memory. We assume instead that the suggested configurations of mnemonic signifiers provide access to the discourse of memory. If Paul Connerton's observations are valid and even ephemeral codes of fashion have the ability to function as vehicles of cultural remembering – because unregulated, informal interaction can convey highly nuanced conceptions of a common history[78] – then formalised ancient religious performances, which did not simply reflect but targeted remembrance by re-enacting and re-narrating events of the past, had an even stronger ability to awaken and enforce group and social identity. The power of such activities lies in that through them cultural memory is made afresh by enacting current visions of a collective past. The rites discussed here were performed for centuries. What may be a seemingly *traditional* and fixed re-enacting performance, appearing static in the eyes of the group (or society) that remembers or witnesses it, is in fact far from this, being subject to historical circumstances, fashion, and aesthetics. These performances are constantly subject to change, best described as 'repetition with revision'.[79] Ritually re-enacted memories were in antiquity subject to revisions, which resulted in changes in the re-enactments and thus the memories over time, following political, social, and national needs.

For Jan Assmann, cultural memory is only one area of the memories created by society and cultural contexts. In his separation of cultural memory from the other three types, namely 'mimetic memory' (formed through imitation), 'the

memory of things' (ideas conveyed in objects), and 'communicative memory' (remembrance triggered through language), he defines 'cultural memory' as 'the handing down of meaning'.[80] Despite this proposed division, Assmann acknowledges that cultural memory encompasses the other three aspects of memory. It is through language, objects, and mimetic actions that cultural memory is shaped. In the context of ancient Greek culture, it is easy to understand why ritual performance lies at the core of creating cultural memory: it encompasses all three aspects of memory – imitation, objects, and language.[81]

The workings of human memory require a study of the interaction between agent and resource, of the ways information is transmitted and adds to an existing knowledge base, and of how the duality of brain/mind deals with memories. This entails a study of the relationships between agents, artefacts, and cognitive environment. Since the retrieval and stimulation of information stored in the brain relies on specific conditions, a number of factors which influence the relationship between agent and resources are responsible for affecting memories and remembering. Material Engagement Theory has complemented Extended Mind Theory through an awareness of the relationship 'between cognition and material culture'.[82] Extended Mind Theory has demonstrated that internally defined experiences and cognitive processes can be supplemented by external factors (e.g., environmental), leading to a better understanding of the connections between the brain, the body, and the (physical and social) world influencing cognition. An explicit outcome of research on collective remembering and the role of the cognitive environment is that the inability of an individual to access these memories alone does not mean that these memories were forgotten. Instead, research in cognitive psychology has demonstrated that collective remembering facilitates and creates stimulants for the brain to retrieve information that the individual would have not been able to recall alone.[83] Engaging in a dialogue within a group, for instance, can result in mnemonic emergence of memories by means of 'interactive cross-cueing', which may not be instantly accessible by the individual alone. This collective remembering enables the brain to retrieve memories that may have been absent if remembering was taking place individually. The example of an elderly couple discussing events of their honeymoon forty years ago is indicative of collective remembering and 'interactive cross-cueing' in action.[84] Similarly, the paradigm of the divers being able to recall information learnt underwater better than on land exemplifies the significance of the cognitive environment.[85] That certain information can be unavailable in certain circumstances does not mean that this information is lost, but instead that it is inaccessible under specific conditions.[86]

This ability of the brain to retrieve information which was seemingly unavailable has been recently noted by Eva Kundtová Klocová and Armin

Geertz, who argue that the triad of body, brain, and mind are not just linked within the body they belong to, but they are also enmeshed 'externally in a vast network of other brains, bodies, and minds'.[87] There is no reason to assume that this would not occur also when recalling information and memories of ancient Greek rituals. Architecture, art, and ritual performance assisted memory by providing the necessary physical context to awaken stories and myths. Katasterism myths are equally involved in this interplay. The context provided by a place and through the ritual performance facilitated mental reconstructions and remembrance of events or experiences from the agent's memory store. For Jacob Arlow, this would have been the occasion when myth, society's common fantasy, helped participants to relate to their cultural group.[88] These stories reflect relations and can define networks.[89] The stability of a memory over time is then not achieved through explicit attempts to remember the specific memory, but through finding oneself in the precise context which enables the mind to retrieve the specific memory (place, architecture, dialogue, object, conditions, etc.). Combined with personal experience, the complex network of remembrance and experience (in the context of Greek rituals) involved also recollections of individual celestial myths from a distant past, when the night sky was embellished by the gods with the carpet of constellations. This is the so-called context-dependent reconstruction.[90] We explore in Chapters 5 and 6 examples of collective remembering and 'interactive cross-cueing' in ancient Greek ritual performance facilitated through the recitation of text or mythical narratives combined with the presence of relevant astronomical observations at the time of ritual performance. Such are the performance of the Chorus, Hagesichora, and Agido in Alkman's *Partheneion*, the re-enactment of Erichthonios' myth during the Arrephoria, and that of Persephone's abduction in the Eleusinian Mysteries.

Collective remembering and the cognitive environment are then essential parts of mnemonic emergence. The environment in which memories are shaped sculpts the context and expression of both personal and shared memories and triggers remembering during re-enactments. This cognitive environment involves a number of elements: social, temporal (i.e., a specific time in the year or day/night), geographical (i.e., specific landscapes linked to specific memories), etc. The number of parameters influencing the shape of an environment exemplifies the mutability of the act of retrieving memories, which can occur in isolation or under a range of collective contexts and conditions with varying sizes of groups, functions, and durability.[91] It is now explicitly clear why the act of remembering is highly susceptible to context. This point is of particular importance to the rituals explored in the following chapters, because by carefully studying the orchestrated conditions and environment of rituals, we can suggest the inclusion of specific elements which determined

the formation, propagation, and retrieval of memories. Aside from the importance of staging the desired environment to trigger mnemonic emergence, though, other internal or external factors (neural, bodily, social, technological, institutional, etc.) influence the way memories are stored and retrieved.

THE IMPORTANCE OF PLACE

We briefly mentioned that place and space play a seminal role in the unfolding of memory, particularly cultural memory. The ease with which landscapes can be assigned meanings and ideas on an individual, group (e.g., kin), or cultural level makes them particularly informative in cognitive studies. The relationship between place and memory was acknowledged early in the quest to understand the workings of memory.[92] Place as a notion involves a space that can not only be remembered and imagined,[93] but also space in the Aristotelian sense, which has the ability to contain (περιέχων)[94] – the ability to hold meanings and memories of individual experiences, but also memories constructed through collective interaction.[95] The sense of a place seems inseparable from what Ruth van Dyke and Susan Alcock call 'a sensual experience'.[96] As exemplified in ancient Greek religious spaces and festivals, the sense of a place was inextricably bound with the land- and skyscape, narratives, observation, time, performance, movement, etc. – activities incorporated in all manifestations of religious practice.[97] Ancient Greek religious spaces, because of their long history of sanctification and their entanglement with foundation myths, involving in most cases divine epiphany, were more than natural environments; they were a silent, morphological representation of history. And religious architecture, constructed within these spaces, was naturally decisive in collective remembering. The way we understand the link between a space and the past is affected by the manner through which this space is 'preserved by our physical surrounding'.[98] The 'physical surrounding' involves traces of human activity. So human presence in a landscape creates, legitimates, and reinforces social relationships and ideas.[99] In archaeology, a place can become the *terminus a quo* in approaching past social memory. This understanding, combined with the close connection between sight and fantasy we explored earlier in this chapter, distils the idea that the outside world comprises a projection of the observer's cognitive processes – a commentary on the objectivity of vision. Since, as we saw earlier, the brain is part of the visual system, vision also includes cognitive interpretations of what is perceived by the optical system.

Understood as it is that many past culturally specific contextual meanings can never be known, the progress of phenomenological approaches in archaeology over the past twenty years has assisted investigations of ways in which landscapes and built forms influence cognition.[100] More recent criticisms of

phenomenological approaches have assisted greatly in improving our approach to the ancient experience of space and landscape. Such criticisms concern the phenomenological sense of a viewer who is solitary in experiencing the landscape with no consideration of aspects which may influence experience (such as social status, age, background, etc.), and also phenomenology's tendency to view landscapes as if through an observer lacking a routine or physical relationship with them.[101] These criticisms are important, as certain ancient Greek landscapes were assigned cosmological meanings. This is perhaps more evident in landscapes imbued with liminal qualities, which could be conceived as places of entry into another state of being, another consciousness. It is not a coincidence that a number of such places bear the traces of religious sanctuaries in ancient Greece. Sanctuaries were obvious spaces for forging, negotiating, and propagating memory, even in their early phases.[102] The areas carrying cosmic significance are perhaps 'the most effective carriers of social memory'.[103]

Mystery cult sanctuaries like those examined in Chapter 6 encompassed such correlations. What is important to note here is that human experience is inseparable from memories and, particularly in the context of ancient Greek festivals, memories are produced through collective interaction, rarely as solitary encounters.[104] In addition to this connection between memory and experience, religious festivals were also multisensory embodied experiences, which intensively engaged all the senses, particularly vision, smell, taste, and hearing.[105] Religious visions, beliefs, and rituals have been argued to be the 'three main ways in which embodiment is at play'.[106] Rituals use embodiments in order to convey religious messages verbally and visually. Through this process, or, in other words, through embodiments, religious messages are imprinted on memory and serve as cognitive anchors.[107] The specific parts of ritual experience this work focuses on are not associated with smell and taste, but are very much experienced through vision and hearing, particularly during those ritual moments when communication with the divine was envisioned.[108]

The following chapters, whose conclusions accept the neurophysiological processes of experiences based on the senses, identify at the same time the uniqueness of these experiences, which have ultimately been shaped and articulated by the specific context which created them (historical, cultural, political, and religious, but also bodily perception, memory, etc.).[109]

Forty years ago, Halbwachs discussed the function of the built environment as a repository of conscious and unconscious collective memories and the idea that these memories can be challenged and strengthened through actions, practices, and performances. Through these processes, emotional attachments are created between communities and their environments.[110] But let us step back for one moment to explore the meaning of a place and the semantics of what a place is by exploring our broader understanding of *home* not in the sense

of a house, but in its broader sense as the space we occupy. Our experience of home is inseparable from a spatial system which includes the surrounding skyscape, with our home placed in the centre of this environment. This perception derives from experience: the skyscape moves around us, placing us seemingly in the centre, making us 'the focal point of a cosmic structure'.[111] But the concept of a centre translates to a sense of attraction. Something is the centre because everything else exists around it. In ancient Greek cognition the earth was the centre of the cosmic structure because the entire cosmos seemed to rotate around it. Aristarchus' first heliocentric theory did very little to shake this well-established view because it defied the senses. We physically see the world rotate around us daily. Experience can be very difficult to separate from belief, or even to set in opposition to belief. This is strengthened by the fact that human life is pivotal to notions of centrality and place. In other words, as Dylan Trigg noted, it is through our bodies that it is possible to define and give shape to understanding a place and architecture, because everything we perceive exists in relation to our bodies.[112] Human experience of places generates a memory bank, which becomes the extension of a place in human cognition and thus an integral part of the group's or individual's sense of self. But no perception can be independent of memories.[113] So when we talk about the importance of a place, we talk about the memories this place holds, be they those of a group or an individual. We also talk about the specific social, religious, and historical conditions which activate specific, albeit to a great extent subjective, sensorial experiences and memories. The field of cognitive science agrees that the brain deals with the world through the use of maps or models as frameworks.[114] Orientations, lines of sight, spatial movement – in other words, methods based on a space syntax – become particularly important in enriching interpretations of perception. Yet, the ongoing debate about the extent to which we can understand the ancient Greek mind is one of great significance to cognitive interpretations.[115]

THREE

WORSHIP IN SPACE AND TIME

INTRODUCTION

The first aim of this chapter is to revisit the still-resonant idea of the general eastern orientation of Greek temples,[1] most commonly known through William Dinsmoor's 1930s analysis of 110 temple orientations. We briefly discussed this idea in Chapter 2. Here, an analysis of a data set more than twice as large as Dinsmoor's examines anew the placement of Greek temples in their spatio-temporal context. The 232 religious structures surveyed date from the Mycenaean to the Roman period and are located geographically in Greece, Asia Minor, Sicily, and Cyprus. These structures have revealed a total sample of 240 orientations if we include the side entrances. The structures with side entrances are the Telesterion of Eleusis, the temples of Despoina in Lykosoura, Alea in Tegea, Apollo in Bassae, the Thesmophorion of Pella, and the *Oikos* of the Naxians in Delos.

This sample is not exhaustive – some important colonies are missing, particularly those of southern Italy and the Black Sea (but also North Africa). The reason for this omission is twofold. The main aim of this work is to investigate practices within the Greek space, rendering the inclusion of colonies peripheral to the study at this stage. This is exemplified in the cults selected for in-depth analysis in Chapters 4–6. The inclusion of a full sample of all the colonies would result in an enormous volume of data. Greek temples located in colonies deserve a detailed analysis of their own, certainly an

endeavour worth pursuing, not least because of the wealth of material and non-Greek influences in Greek religious practice. Still, a small selection of Greek colonies is included here. Their choice was determined purely by ease of access and helps to perform an initial cross-referencing of the results from the Greek space.

The data presented here enable us to scrutinise the idea of the canonical eastern orientation of Greek temples in a number of ways. This chapter explores whether there existed general astronomical principles that may have governed the placement of Greek temples (e.g., the rising or setting sun or moon). It aims to elucidate questions and to exhaust all possibilities concerning the deliberate astronomical placement of Greek temples in general, investigating also the distribution of orientations by deity and chronological period. As becomes apparent, such a general analysis can only offer answers concerning patterns on a general level. Thus, it affirms the need for case-specific studies such as those offered in Chapters 4–6. Ultimately, the aim is to understand the function of temples in relation to astronomy and the environment (land- and skyscape) within which they are situated. To do this, we must first map ancient Greek cult practice.

It is indeed possible that Greek temples were oriented in relation to astronomical targets of significance to the group which constructed them. As we saw in the previous chapters, this idea is in accordance with ancient Greek perceptions of a cosmos where no part is independent of the others. Earlier research has revealed that – as in the case of earlier archaeoastronomical work – a 'broad brush' approach, which interprets every example of Greek religious architecture in the same manner, fails to convince.[2] The inherent problem with interpreting landscape features is that each observer will choose to focus on different features in the landscape, assigning different meanings or attributes, in the same manner as two artists producing different depictions of the same landscape in a painting. For example, Vincent Scully saw female figures, heads, and horns of animals in the Greek religious landscape (e.g., crouching lions in the mountains of Acrocorinth),[3] but there is no associated evidence to confirm that these were also identified as such by the ancients. A rigorous methodology is therefore essential in studies of this sort.

On the other hand, orienting structures in relation to celestial objects and meteorological phenomena seems a familiar concept in Greek thought. Such practices certainly existed in Classical Greece. An example of ancient sources speaking of the optimal orientation of structures, streets, and *agoras* is found in Aristophanes, describing Meton – known to us mostly for his astronomical pursuits – as a cosmic city planner, geometrician, and surveyor who applied celestial principles to the layout of cities.[4] Such examples lead us to consider the possibility that the (re-)organisation of social space within a city may have been linked to the organisation of and beliefs about physical space in Greek

cosmological ideas. To our knowledge, these concepts seem to appear with Anaximander (ca. 610–546 BCE), who first introduces the concepts of geometry in the city and the universe,[5] but it is likely that the origins of this idea date to an earlier period. The development of Greek religious architecture began in the 'Dark Ages', but did not spread until the seventh to sixth centuries BCE, close to Anaximander's time. By the time of Kleisthenes of Athens and his numerologically based political reforms at the end of the sixth century BCE, it is argued that cities reflect what happens in the heavens so that the microcosm of the city participates in the macrocosm of the universe.[6]

GENERAL ASTRONOMICAL CONSIDERATIONS ON THE ORIENTATION OF GREEK TEMPLES

The possibility of astronomically significant orientations of Greek temples can be examined in two ways. First, by looking at their orientation in relation to the cardinal points, we can investigate the presence of patterns in relation to the four cardinal sections of the horizon. Second, as we discussed in Chapter 2, by converting the azimuths to declinations, it is possible to obtain more informative orientation data which accounts for geographic coordinates, the height of the horizon, and other parameters (e.g., atmospheric extinction and refraction).

The orientation of Greek temples to face the rising sun has been a fundamental issue in the quest to determine whether Greek temple orientation was deliberate and associated with astronomical observations. But what does an eastern orientation actually mean? If Greek temples did indeed face east, what would this mean for our understanding of Greek religious practice? Undeniably, if we were in a position to argue with certainty that the movement of the sun played a role in the placement of temples, we would significantly advance our understanding of ancient religious experience. Witnessing a dramatic sunrise at the moment of ritual performance would shape ritual experience through the effects of light and shadow and the integrated cosmological connotations of such an occurrence.

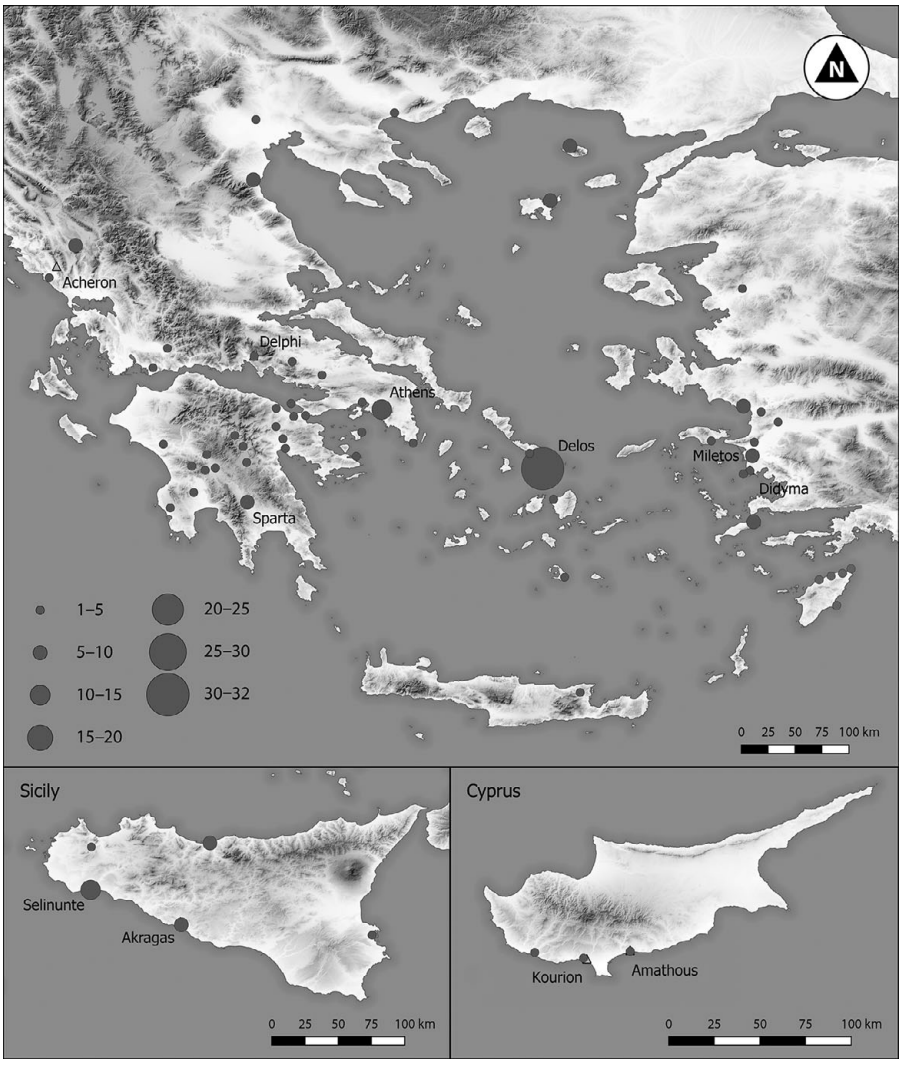
But such a practice introduces a further precondition or limitation to our question. Concluding whether temples simply face towards the east is not sufficient. In order for this assertion to contain culturally significant information, the eastern orientation must be relevant to the rising sun on the day of the temple's major festival. Readers with knowledge of ancient Greek calendars or religion are at this point aware that it is impossible to ascertain such information for the entire set of ancient Greek temples. This is a result of two factors: first, our knowledge of religious calendars is far from complete, with the exception of a few better-documented poleis;[7] and second, as we observed in Chapter 1, even in those cases where we know the time of a major festival,

the conversion of the ancient Greek calendars to modern dates cannot be accomplished with more precision than a three-week window.

Moreover, a further element needs to be considered. Making conclusive determinations about the importance of a temple's orientation becomes a more complicated matter in the presence of side entrances, an architectural feature particularly common in Arkadia. The function of these entrances is not always clear, and their positioning differs. As we will see in Chapter 4, for example, the east-facing side entrance of the temple of Apollo in Bassae is positioned in the part of the temple where the *adyton* is located, indicating a deliberate effort to illuminate that part of the long and rather dark *sekos*. At the temple of Athena Alea in Tegea, the side entrance was placed along the centre of the long wall and was visibly marked on the exterior through the construction of a ramp. But at this site, facing directly north, the side entrance would have received more sunlight during the winter months, when the sun rises lower. Finally, side entrances are also prominent in mystery cult sanctuaries. The temple of Despoina in Lykosoura is a particularly interesting example of linking the side entrance to mystery initiation (most likely during the *deiknymena* or *legomena*),[8] whereas the multiple side entrances of the Eleusinian Telesterion seem to have been constructed to facilitate the admission of large crowds. Multiple entrances are also featured in all of the structures associated with initiation at the Sanctuary of the Great Gods in Samothrace (*Hieron, Anaktoron*, and the Hall of the Choral Dancers), but the number of entrances and their positioning differs in each structure, perhaps indicating a varying role in each case.

Let us consider the general eastern orientation question from the most basic viewpoint: Do temples actually orient towards the east? The question can be answered in a relatively straightforward manner through a temple orientation survey of a representative sample. Dinsmoor's study, the most comprehensive for almost a century, pulled together 110 orientation measurements and concluded that as many as 73 per cent of Greek temples were oriented within 30° of due east.[9] The data set presented here comprises 240 orientations of religious structures collected by the same researcher over ten years, spreading across the same geographic area as Dinsmoor's sample, except for southern Italy, but including Cyprus (Figure 1). Thus, this study offers a more representative sample of the areas concerned, including a denser sample from southern Greece, the Aegean islands, and Asia Minor.

Of the total number of 240 orientations, 237 are included in the general analysis presented below. Three orientations have been omitted, in an attempt to avoid the overrepresentation of two temples. These are the Classical Telesterion of Eleusis, *the Hieron* of Samothrace, and the *Oikos* of the Naxians in Delos, which have entrances on three sides (see Figures 17 and 46). Only the orientations of the entrances located along the façade of the Telesterion and the



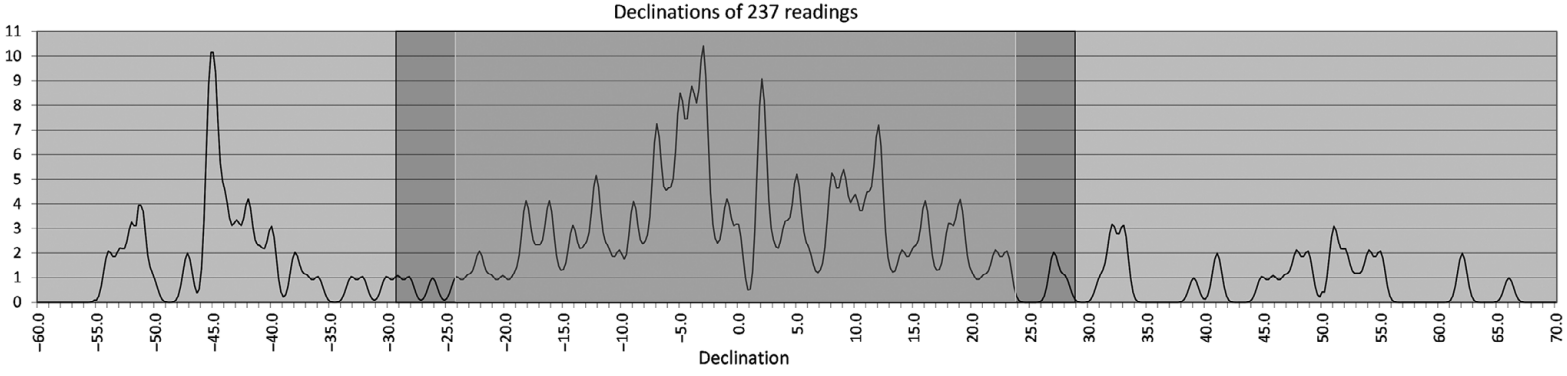
1. Geographical distribution of collected data examined in this chapter

Samothracian Hieron are included. Similarly, the side entrance of the *Oikos* has been excluded, as it is believed to belong to an earlier phase of the structure (the front and back entrances are included). The data set includes a small number of structures which do not conform to the standard Greek temple architecture but which were nevertheless used in religious ritual. Such, for example, are the Thesmophorion of Pella (a circular structure) and five Mycenaean *megara*, most of which are located under later temples (e.g., Tiryns and Eleusis).[10] In addition, the data set also includes fifteen altars and three *stoas*. The inclusion of altars is important, as in some cases they are not paired with temples – one example is the Great Altar of Zeus at Pergamon – and, in other cases, the altars do not follow the orientation of their associated temple (e.g., Apollo's Altar of Horns,

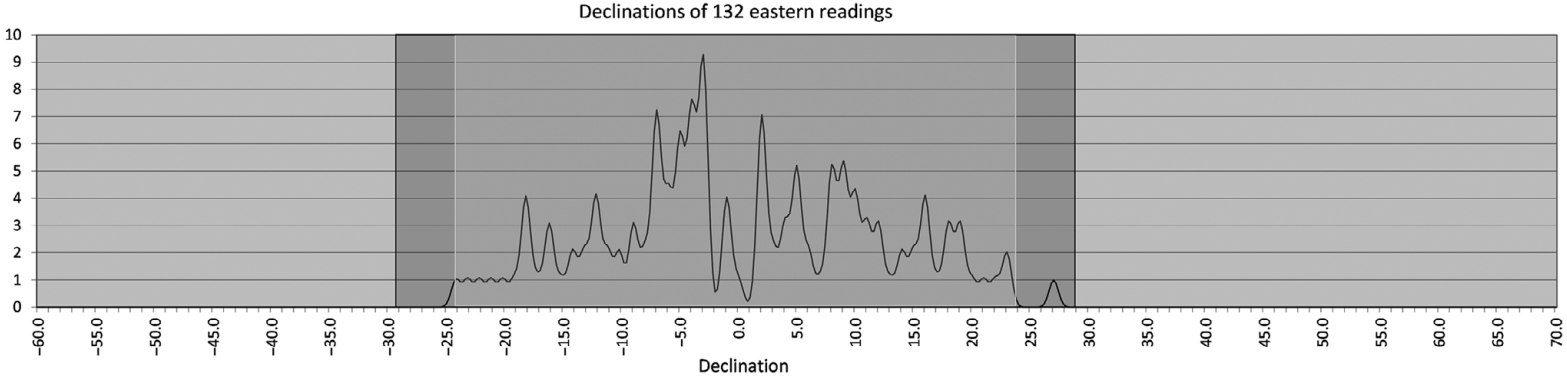
Delos). As we will explore in Chapter 6 when we discuss the cult of Artemis Orthia in Sparta, altars were structures associated with open-air ritual performance, activities which render them of particular importance in the interaction between the human and divine spheres. The three *stoas* included are: the *stoa* of Zeus Eleutherios in the Athenian Agora, the *stoa* of Antigonos in Delos dedicated to Apollo, and the *Hieri stoa* in Priene. All three structures are linked to religious practice, which is why they have been included in the general analysis. In total, 91.2 per cent of the sample is made up of temples (the altars, *stoas*, and *megara* combined are 8.7 per cent), whereas altars and temples together comprise 97.5 per cent of the total sample (if we exclude the *stoas* and Mycenaean *megara*). This is important to bear in mind when comparing the orientation data of the current data set to that of Dinsmoor, so it is clear that we are not comparing dissimilar groups.

Graph 1 offers an analytical distribution of the orientations. The first observation is that the previously argued statistic that 73 per cent of temples have eastern orientations is not validated. Although many orientations fall within the part of the horizon visited by the sun in its annual path, this range in Graph 1 includes both eastern and western orientations. The analysis shows that 55.7 per cent of the sample points within the eastern part of the horizon visited by the sun (132 readings) (Graph 2). Of the total sample, 9.3 per cent is oriented towards the sun's setting path in the west (Graph 3). The majority of these western readings derive from Delos and Asia Minor, with only three mainland Greek sites represented (Lykosoura, Sparta, and Pella). No surveyed sites from Sicily or Cyprus have temples oriented to the west. Although the western-oriented sample forms a small percentage of the total data set, four of these structures are oriented at declination +12°, creating a distinct peak in the histogram (Graph 3). These are the temples of Zeus Hypsistos on Mt Kythnos in Delos, and the three successive temples of Artemis in Ephesos. In sum, 65 per cent of the data set (154 readings) consists of temples whose orientations fall within the solar arc (including both western and eastern orientations). Structures oriented within this range could admit direct sunlight into the temple's interior (should the temple have been open on specific dates during sunrise or sunset), but for 10.1 per cent of the structures surveyed (twenty-four readings) this would occur at sunset.

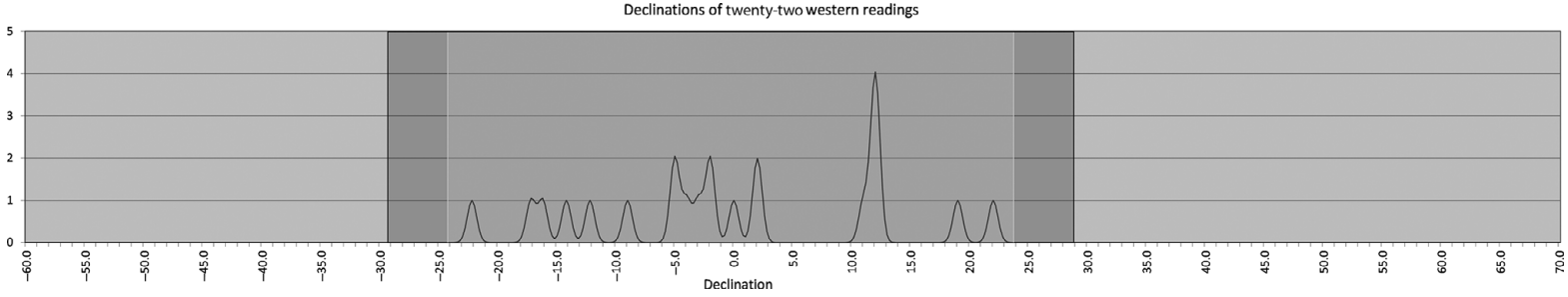
The significance of an eastern orientation lies in its association with the rising sun. The argument that the rays of the rising sun at the time of a festival 'would reach the [cult] image through the temple door' is interesting,[11] and if validated would significantly contribute to our understanding of the function of Greek temples and ritual performance. This idea interprets the temple as the portal which brings a breath of divinity into the world of the living at the time of ritual performance. Although tempting, the idea has two fundamental shortcomings. First, it limits the role of religious architecture to mainly



GRAPH 1. Histogram displaying the general distribution of all collected data. Y axis: temple count; X axis: declinations. Southern declinations fall between –60° and –40°; western and eastern declinations overlap in the centre; northern declinations fall between +40° and +70°. The area shaded in light grey in the centre represents the span of declinations across the horizon visited by the sun throughout the year. The area shaded in darker grey on either side marks the extreme positions of the moon between the minor and major standstills.



GRAPH 2. Distribution of all eastern orientations included in the data set.



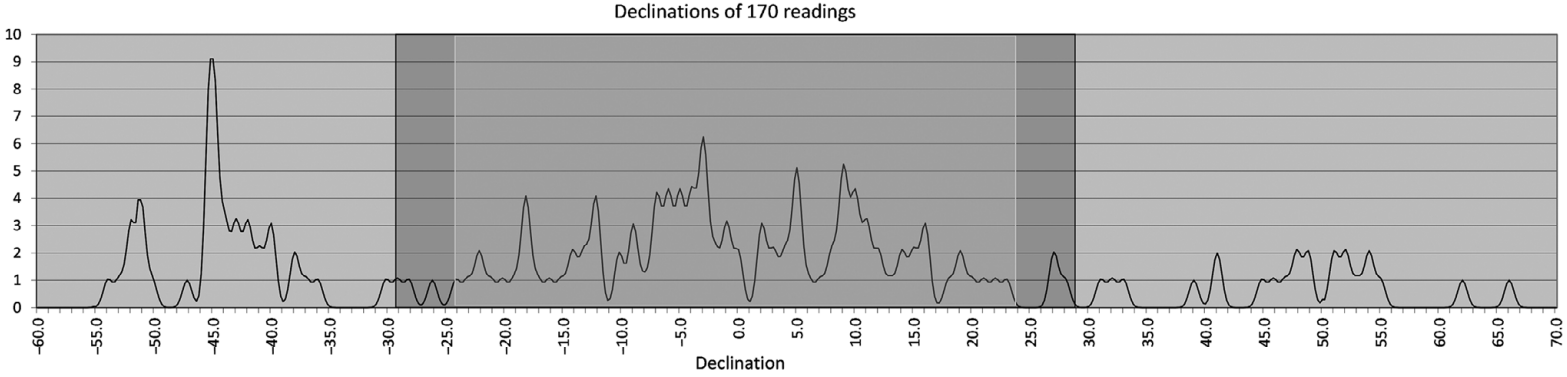
GRAPH 3. Distribution of all western orientations included in the data set.

(if not exclusively) its function as the medium for a visual effect. At the same time, it assumes that all Greek temples were oriented within the solar arc, a fact which the data analysis presented here has not confirmed.

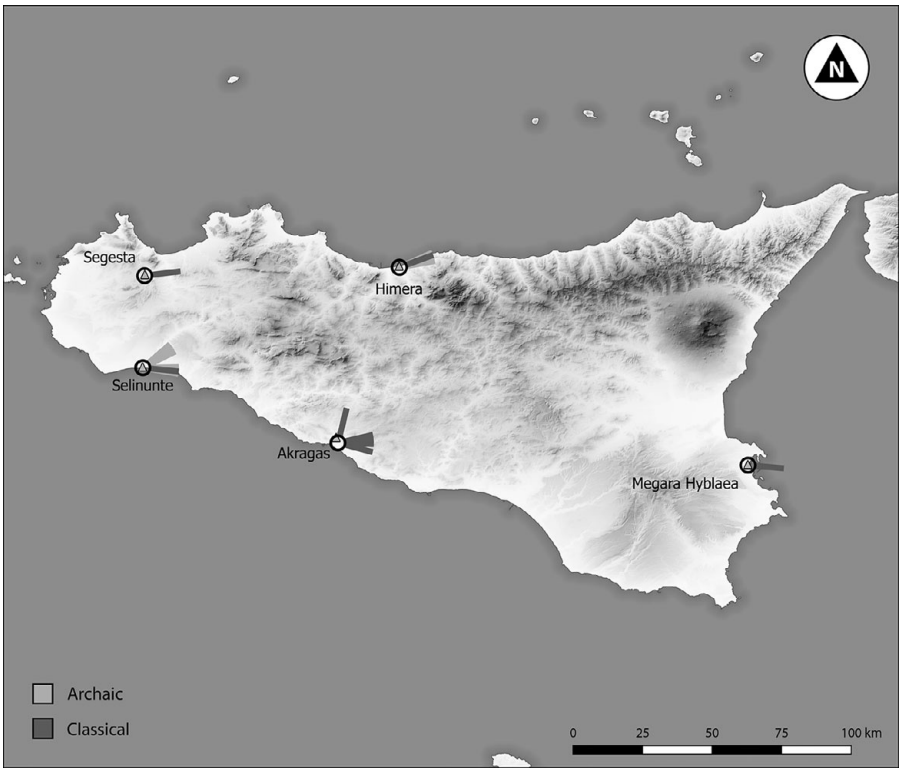
The idea of the general importance of the rising sun can also be dismissed on the grounds of another observation, visible in Graph 1. If the sun was of such fundamental importance to ancient Greek cults, we would expect significant data concentration at the most 'solarly significant' declinations: i.e., the equinoxes and solstices. The overall distribution of the data, however, does not support this idea. As Graph 1 shows, the solstitial declinations (-24° and $+24^\circ$) in fact demonstrate a distinct absence of data. Data concentration is displayed within one month of the solstices from -8° to $+8^\circ$ in orientations deriving from Greece (Graph 4). However, there is a notable lacuna of data at 0°, which is the declination of the sun rising at the actual equinoxes, so this group cannot have been deliberately aimed at the movement of the sun during this time of the year – at least not as a whole. Instead, a data cluster is present further south, at -7° to -3° in both the general distribution (Graph 1) and the Greek data set (Graph 4). In these declinations we find Orion's belt (dec. -7° to -5°) and part of the constellation of Hydra in the years between 650 and 200 BCE,[12] but intentionality cannot be discerned only on the basis of this data cluster. The solstitial cluster of -8° to $+8^\circ$ is maintained across all chronological periods (Graphs 7–9).

A slightly different pattern emerges in the temples of Asia Minor and Sicily. The Sicilian temples demonstrate a distinct preference for the eastern half of the horizon, as shown in Figure 2. The equinoctial cluster is retained in Sicily, albeit in a much tighter range of -5° to $+8^\circ$ with gaps at the time of the actual equinoxes and at declinations $+3^\circ$ to $+4^\circ$ (Graph 5). A similar picture emerges from Asia Minor, but with a more widespread distribution to include also northern and southern orientations (Graph 6). The declinations of fifteen out of a total of thirty-one surveyed structures in Sicily fall within this cluster. The majority of these readings are from Selinous (eight of a total of thirteen structures surveyed in Selinous). The general orientations of the Sicilian sites display a very tight distribution within the solar range, with only a few northern exceptions (two from Selinous and one from Akragas).

The present analysis does not support the idea that the movement of the moon was a determining factor in the orientation of temples (Graph 1). The moon is a rather difficult candidate for structural orientations,[13] since its movement overlaps with the sun's path, but extends further south and north during the major standstills (range shaded darker grey in the graphs) (dec. -28.5° to $+28.5^\circ$). The general distribution of surveyed data displays a clear absence of readings falling within the major lunar limits (Graph 1). More specifically, no temple from Sicily, Asia Minor, or Cyprus is oriented within



GRAPH 4. The distribution of data from religious structures located in Greece. The five declinations within the major lunar limits are from the temple of Great Gods in their Lemnian sanctuary, the Archaic Telesterion in the Lemnian Kabeirion, the temple of Mesopolitis Artemis in Orchomenos, the temple of Erethymios Apollo in Rhodes, and the shrine of Artemidoros in Thera.



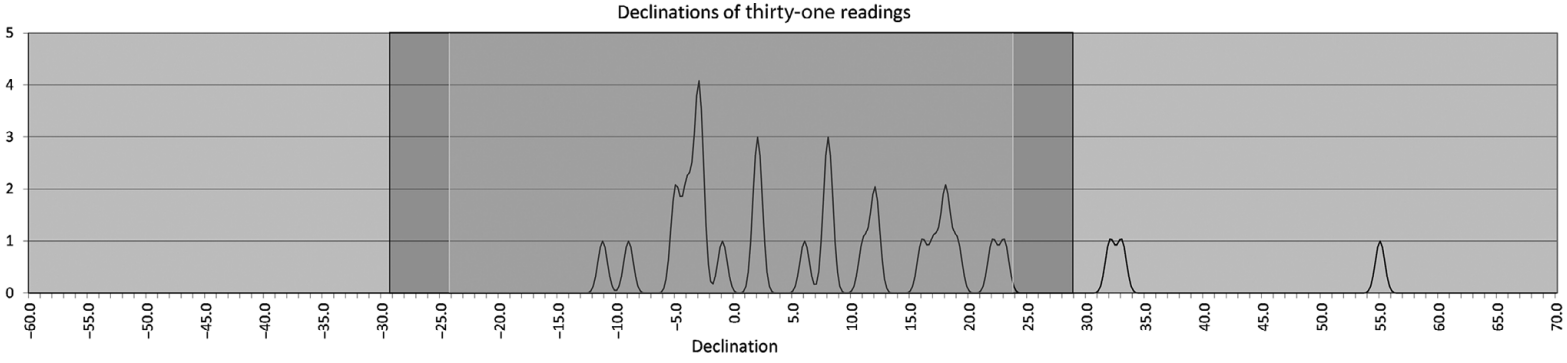
2. Distribution of azimuths of thirty-one Sicilian temples

the major lunar limits, while only five readings fall within this range in the much larger Greek sample (Graph 4).

The 35 per cent of the sample which falls outside the solar arc (including east and west) cannot be ignored. Concluding there to be a sun-related overall orientation of Greek temples would thus leave out more than one-third of Greek temples.

ANALYSIS BY CHRONOLOGICAL PERIOD

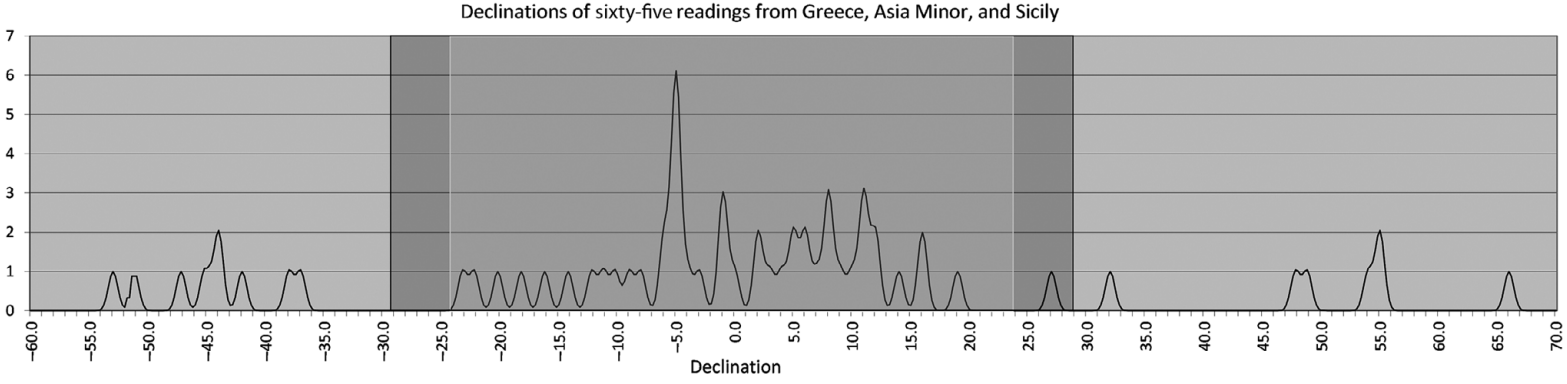
To test whether specific orientation trends were a feature of a certain period and to examine whether such a practice might have been introduced at a certain time, the data set was divided into groups according to the temples' dates of construction. It is possible that breaking down the data into such groups could lead to an overrepresentation of some orientations in those cases where successive reconstructions of temples over different periods occurred. Another parameter to bear in mind is that the dating of five temples stretches across two chronological periods (e.g., the construction of temples A and B in Dion, crossing the Archaic and Classical divide). These structures have been entered in the charts of both chronological periods. In order to avoid



GRAPH 5. Declinations of all surveyed temples from Sicily.

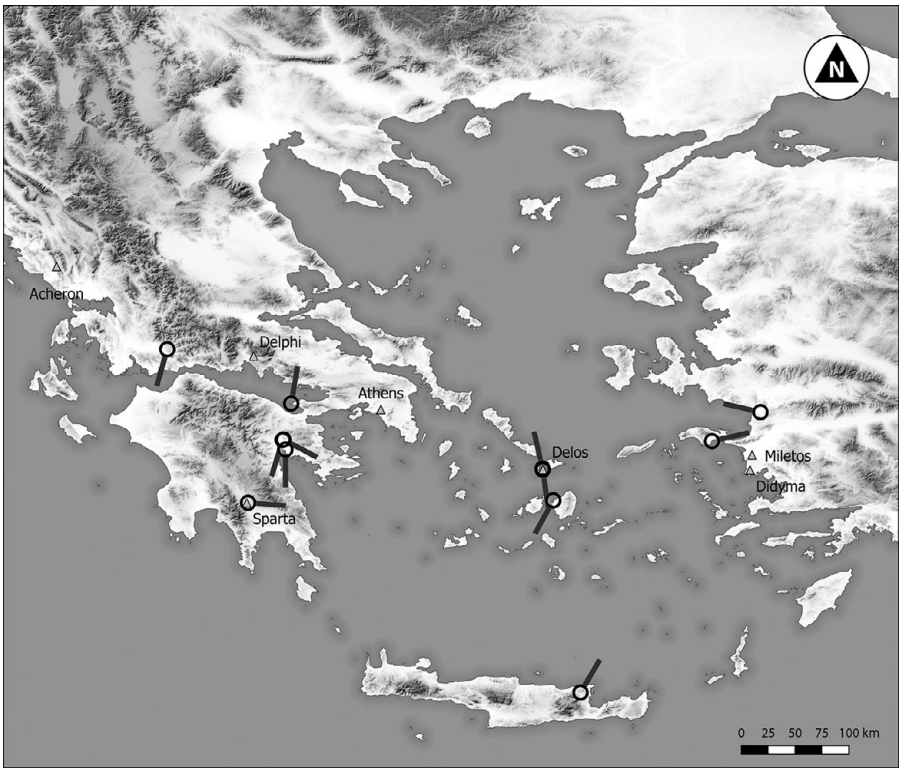
GRAPH 6. Distribution of declinations of all surveyed temples from Asia Minor.

GRAPH 7. Histogram of all temple declinations from the Archaic period. No temples from Cyprus date to this period.



GRAPH 8. Histogram of all temple declinations from the Classical period. No temples from Cyprus date to this period. The peak at dec. -5° comprises the Athenian Agora temple of Apollo Patroos and temple of Zeus Phratrios and Athena Phratria, the Delian Great temple of Apollo and temple of the Athenians, temple A of the Selinous Acropolis, and temple E of the Selinous east hill.

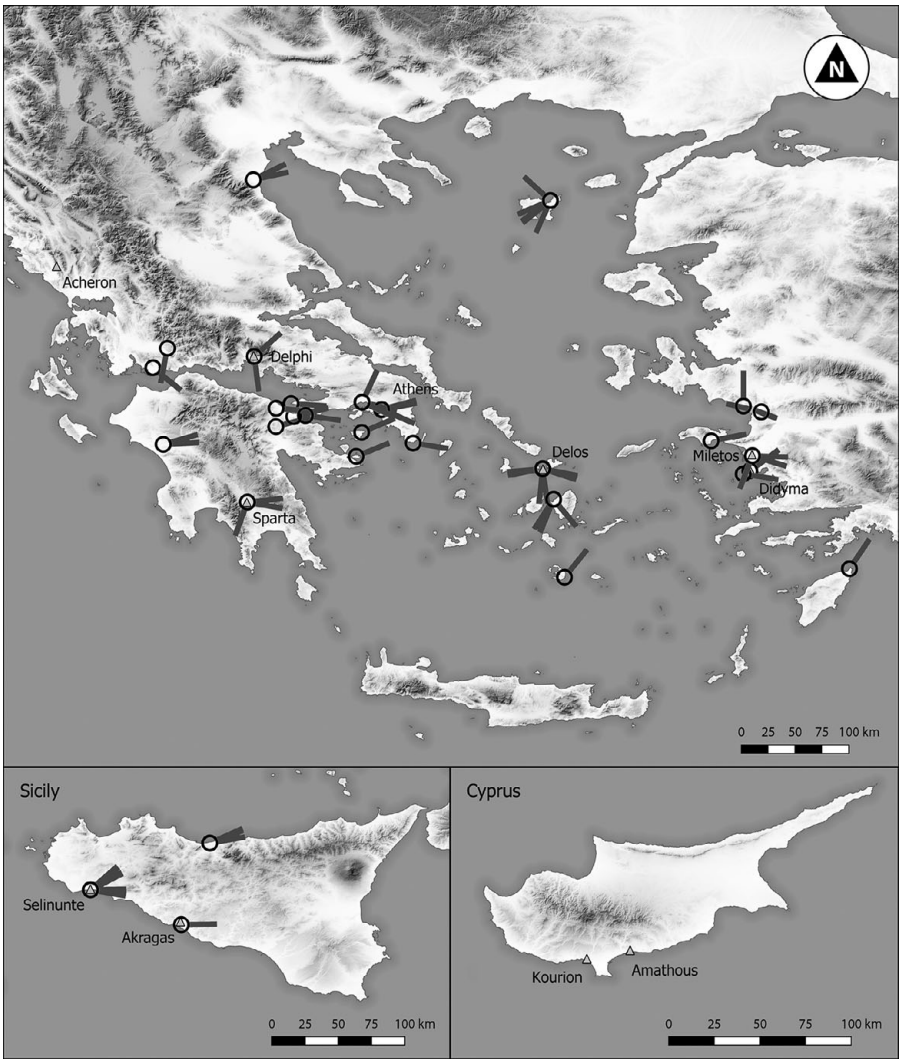
GRAPH 9. Histogram of all temple declinations from the Hellenistic period. No temples from Sicily date to this period.



3. Distribution of all azimuths of temples dating to the Geometric period

misleading conclusions, the trends picked up in the histograms have been checked against such minor overrepresentations.

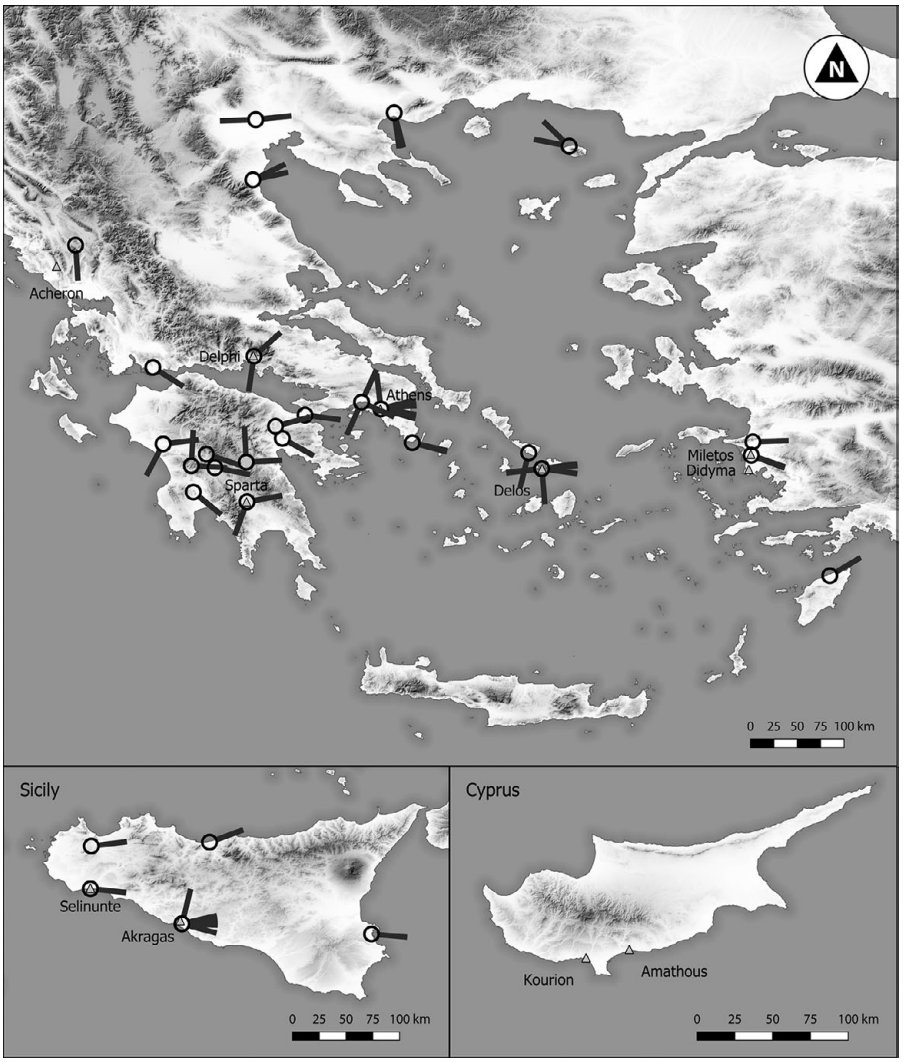
The analysis of the data by chronological period reveals that the principles behind the placement of ancient Greek temples remained either unchanged or little changed from the Mycenaean to the Roman periods. The small size of the Geometric group (Figure 3) does not lend itself to a meaningful histogram analysis. The best-represented periods are Archaic, Classical, and Hellenistic; the general temple orientations of each of these periods are shown in Figures 4–6. No general distribution patterns can be discerned by examining the azimuths in these figures. When plotting the data into a declination histogram, the resulting distribution patterns seem to be similar to those observed in Graph 1 (Graphs 7–9). The three distinct clusters of Graph 1 (east/west, south, and north) are also present in every chronological period. The -7° to -3° cluster is most evident in the Classical and Hellenistic periods, while in the Archaic, the cluster extends slightly further south up to -9°. The Cypriot and Sicilian samples alone are too small for this type of analysis.



4. Azimuths of all surveyed temples dating to the Archaic period

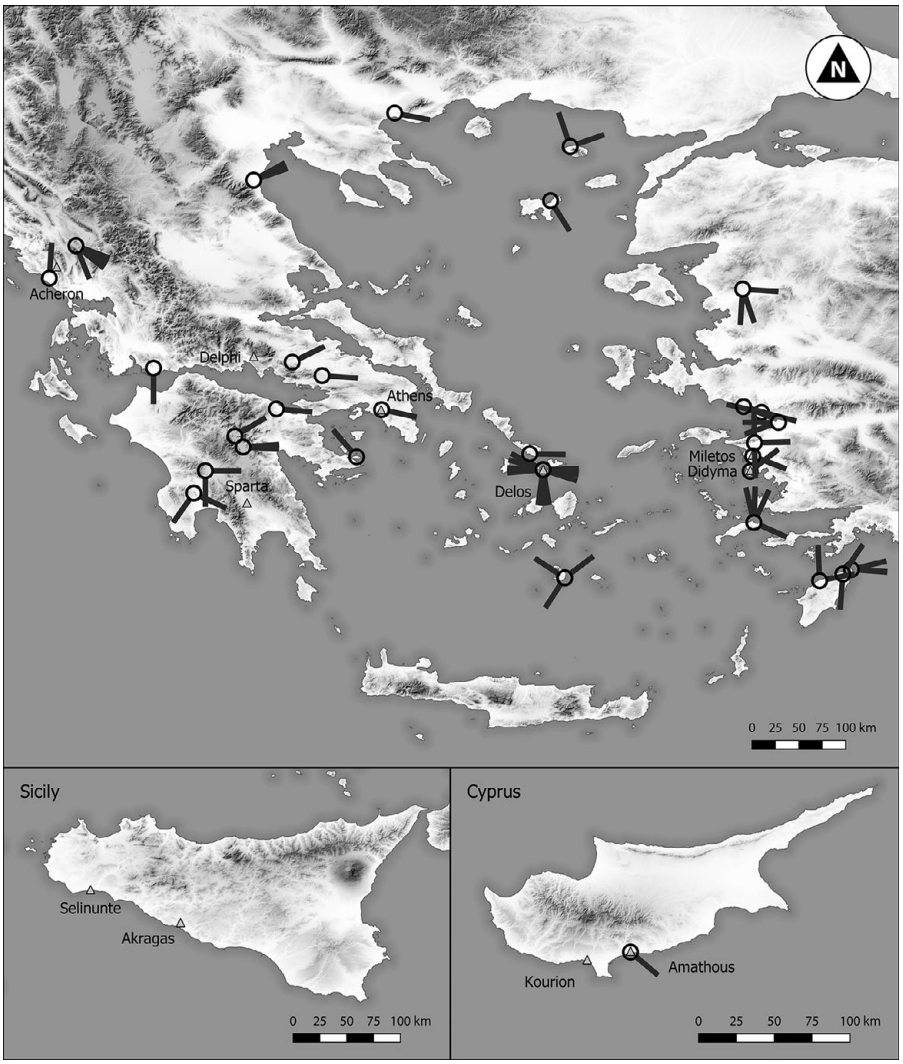
ANALYSIS BY DEITY

A general analysis stripped of any kind of cultural information can only achieve limited conclusions. Before reaching conclusive interpretations about the general distribution patterns, it is essential to investigate whether certain deities required specific orientations for their temples. Not all deities are well represented in the data set, so only those which can yield meaningful results are analysed here, but they are the major deities of the Greek pantheon: Apollo, Artemis, Athena, Hera, Zeus, and Poseidon.



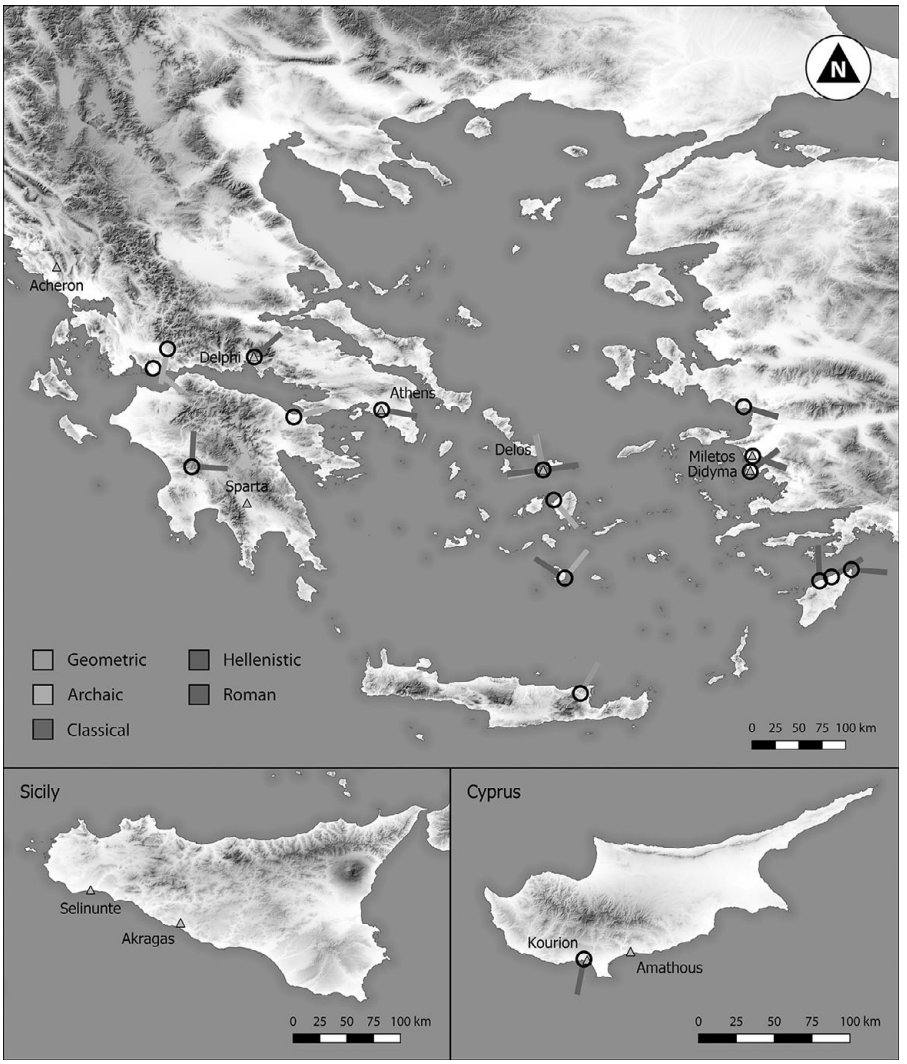
5. Azimuths of all surveyed temples dating to the Classical period

Should the sun have played a role in the positioning of a deity's temples, **Apollo** would be the most favourable candidate to have his temples oriented within the solar range, given his intimate association with the sun and timekeeping. Apollo is the best-represented deity of the sample, with thirty-one temple orientations (including side entrances) available from seventeen different sites. Nineteen readings are oriented to the eastern half of the horizon (Figure 7), but not all of these fall within the solar arc (Graph 10). Of the thirty-one orientations, nine face the rising sun in the east and five its setting in the west (Table 3.1). Combined, these comprise 45.2 per cent of surveyed Apollo temples. But when compared to the 65 per cent of temples from the general data set that orient towards the east or west (Graph 1), it appears that



6. Azimuths of all surveyed temples dating to the Hellenistic period

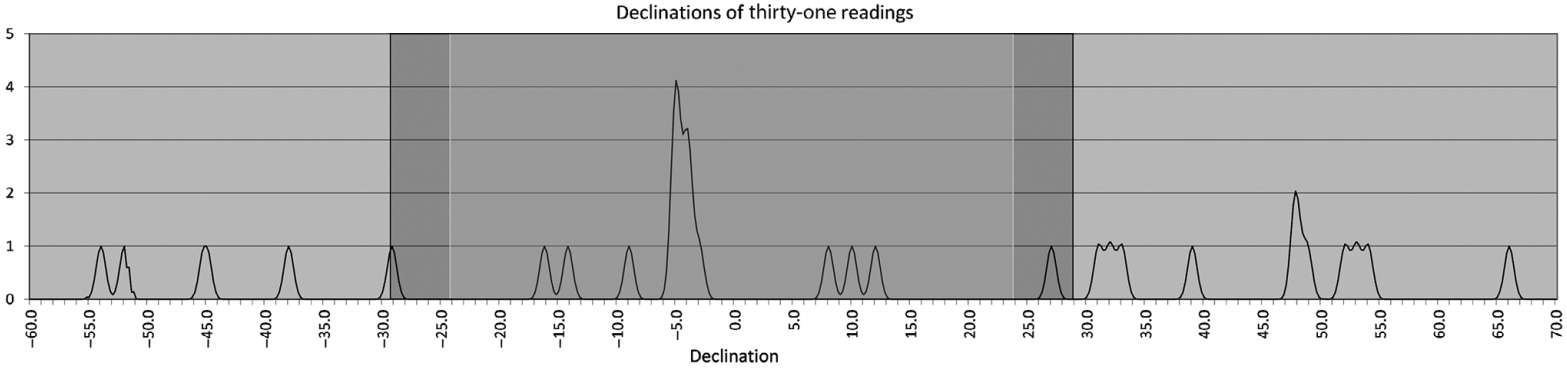
the argument of an overall role of the sun in the placement of Greek temples cannot be confirmed even for the god of light. The interesting peak between dec. -5° to -3° (eight readings), which is also present in the general distribution of the data as discussed previously, includes the god's temples in Athens, the Bassae east entrance, his three temples in Delos, and those of Klaros and Rhodes. An intriguing observation in the Apollo sample is that the northern declinations are the second-largest cluster, with twelve readings (Graph 10), more than the god's eastern orientations and almost as many as the east and west solar range cluster. This northern group includes some of Apollo's most important and oldest cult sites such as Bassae, temple Γ in Delos, Delphi, Dreros, and Didyma. These observations are discussed in more detail in



7. Distribution of azimuths from temples dedicated to Apollo. Temple C in Selinous has been tentatively identified as dedicated to Apollo. Since the identification is not conclusive, this structure has been omitted from the histogram. For colour version, see the plate section.

Chapter 4, which offers an in-depth analysis of the placement of Apollo's temples.

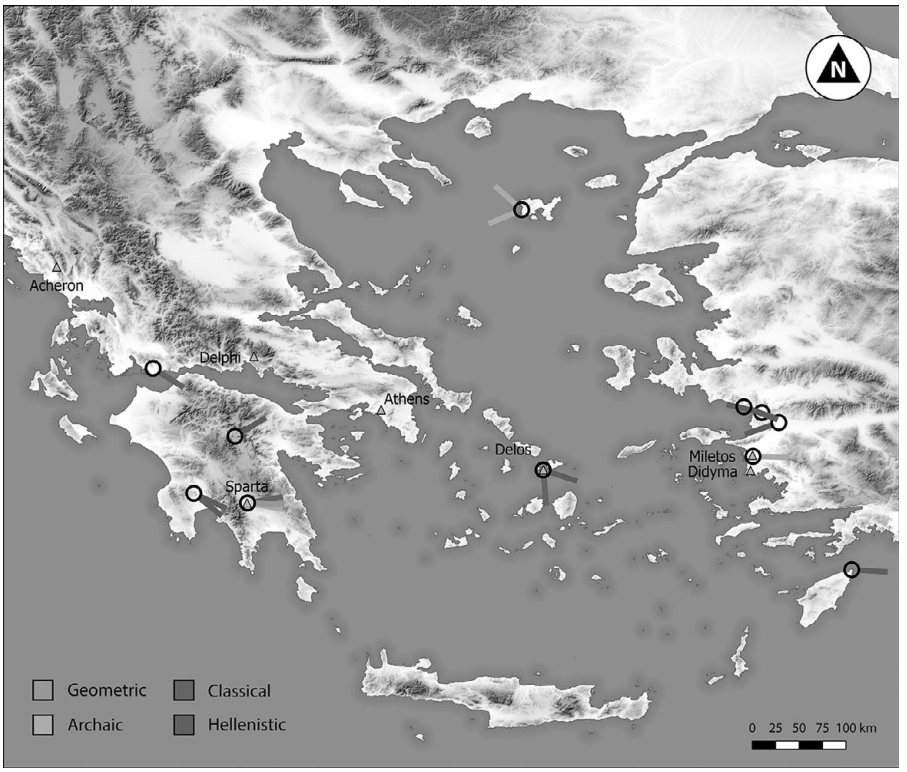
A general mapping of **Artemis**' azimuths does not indicate an orientational preference (Figure 8), but unlike Apollo, the majority of her temples are oriented within the solar arc (nineteen of twenty-two readings), demonstrating a stronger solar association for Artemis than for her brother (Graph 11, Table 3.1). Of these, the only ones which face west are: the north-west room in the *temenos* of Artemis Selene in Lemnos, the temple of Artemis Leukophryne in Magnesia (Asia Minor), and her three successive temples in



GRAPH 10. Declinations of Apollo temples from Greece, Asia Minor, and Cyprus.

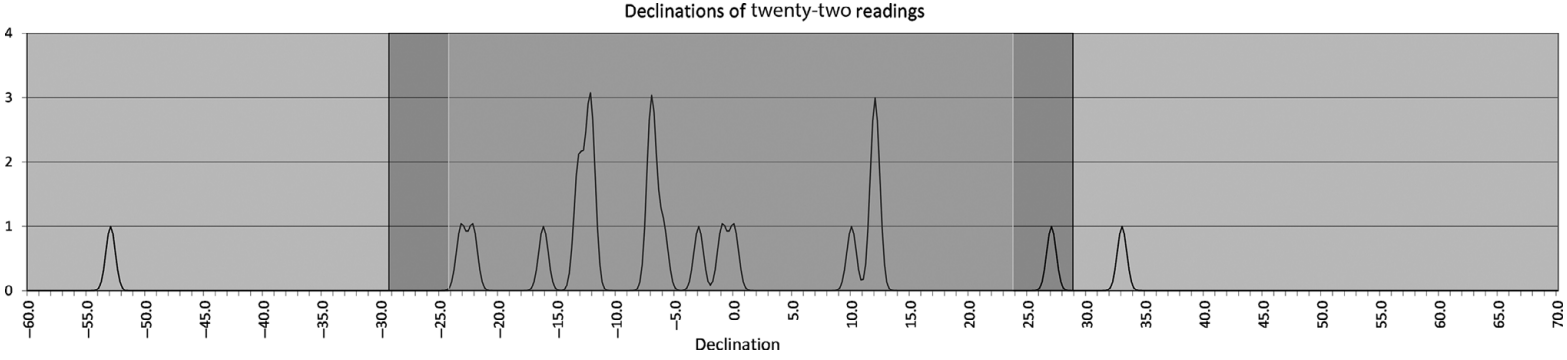
TABLE 3.1. *Breakdown of temple orientations in relation to the solar arc*

Deity	No. of surveyed structures	East solar arc	West solar arc	Outside solar arc
Apollo	31	9	5	17
Artemis	22	14	5	3
Athena	20	11	0	9
Hera	15	11	0	4
Zeus	19	14	2	3
Poseidon	9	7	0	2

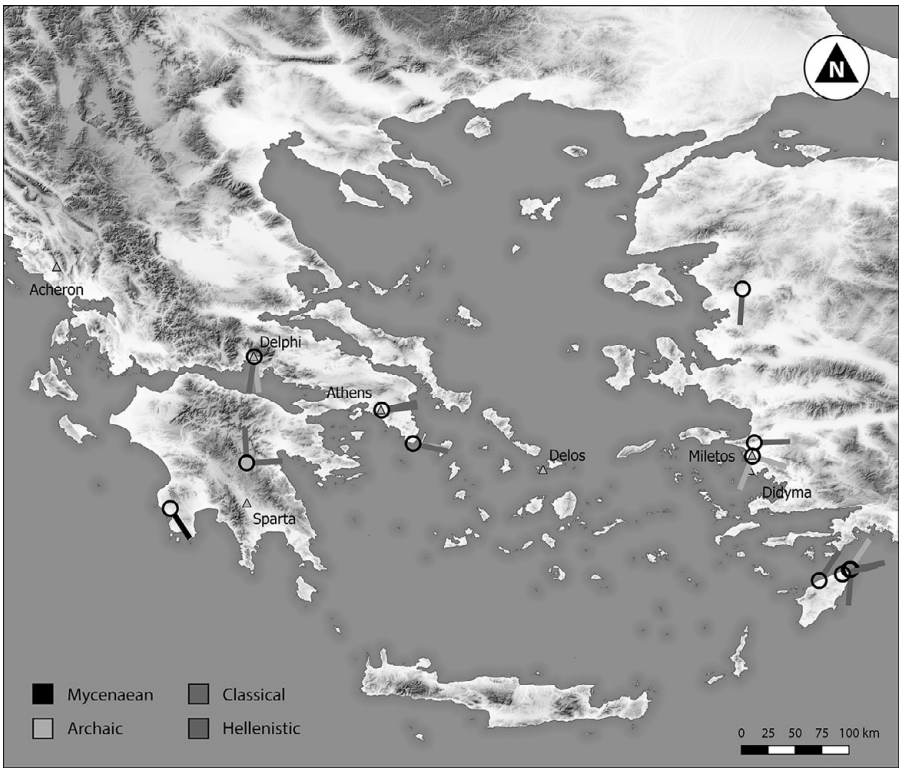


8. Distribution of the orientations of twenty-two temples dedicated to Artemis. The Classical temple in Selinous, Temple A, is identified as dedicated to either Leda or Artemis. Since this not a conclusive identification, the structure has been omitted from the histogram. For colour version, see the plate section.

Ephesos. The data set includes also her temple and two altars in Klaros. The three peaks at $+12^{\circ}$, -7°, and -12° to -13° are the result of the over-representation of her successive temples in Ephesos, the temple and altars in Klaros, and the Messenian and Delian structures respectively. The predominance of Artemis temple orientations within the solar arc is a good example of



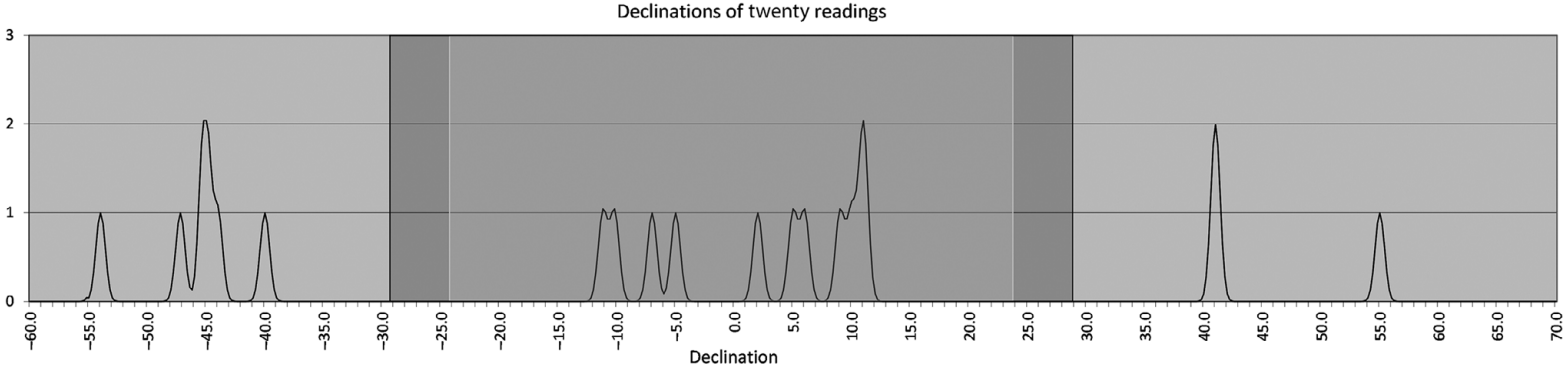
GRAPH 11. Declinations of all temples securely identified as dedicated to Artemis. They are from Greece and Asia Minor.



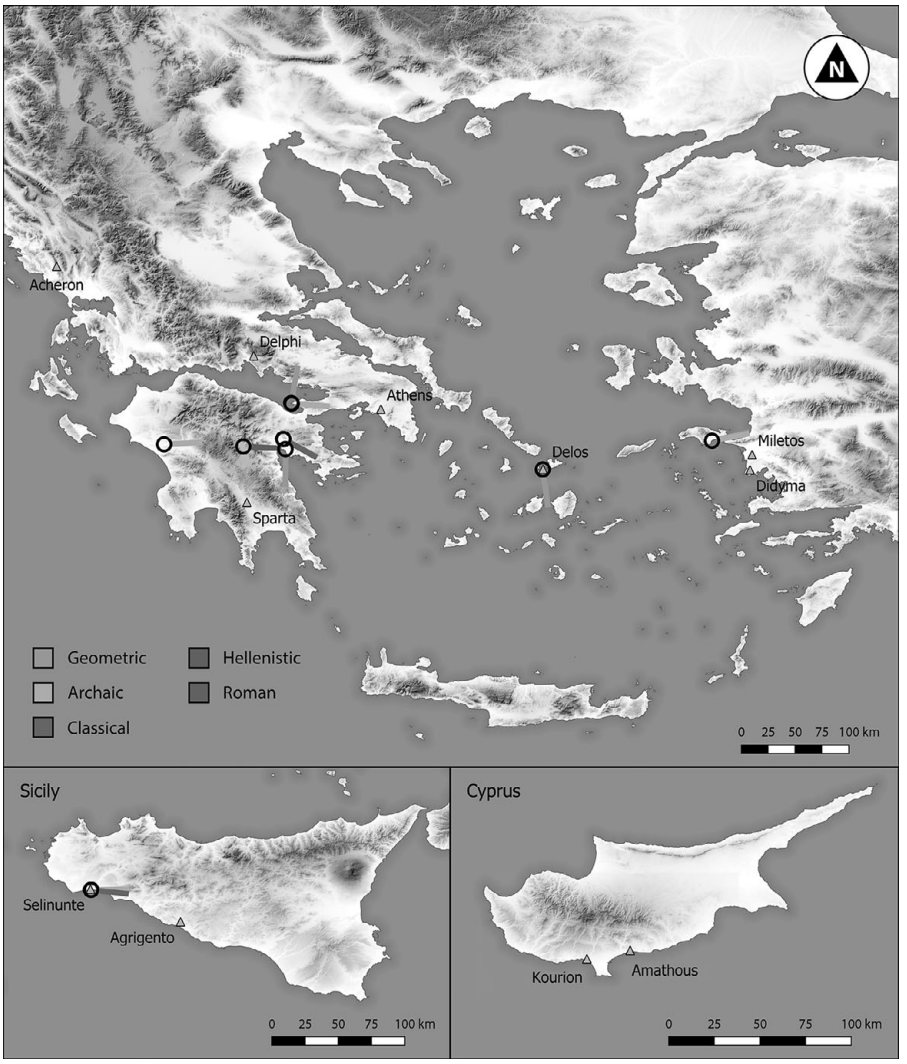
9. Orientations of twenty temples dedicated to Athena. No temples from Sicily or Cyprus were dedicated to the goddess. For colour version, see the plate section.

the risks of assigning intention based solely on numbers (rather than context), when this was probably not intended by the temple builders. Artemis was associated with the moon in Greek cult – yet her temples display a solar preference. Only one declination falls within the northern major lunar limits (the temple in the Agora of Orchomenos, Peloponnese). Even the entrance of the main structure of her Lemnian sanctuary, where she was worshipped as Artemis Selene (Moon), cannot be associated with the moon. At dec. $+33^{\circ}$, it faces a few degrees north of the major northern lunar limits.

Equally interesting is the distribution of **Athena**'s temples, which although dating mainly to the Classical period are oriented in their vast majority towards the eastern half of the horizon (Figure 9). Of the twenty temples included here, the Archaic temple of Athena in Miletos, the Classical temple of Athena Pronaia in Delphi, the side entrance of Athena Alea's temple in Tegea, and her Hellenistic temple in Ialysos, Rhodes, do not conform to this preference. Although the cardinal distribution shows a distinct eastern preference, when the orientations are converted to declinations, we observe that just over half (eleven readings) fall within the solar range (Graph 12, Table 3.1).



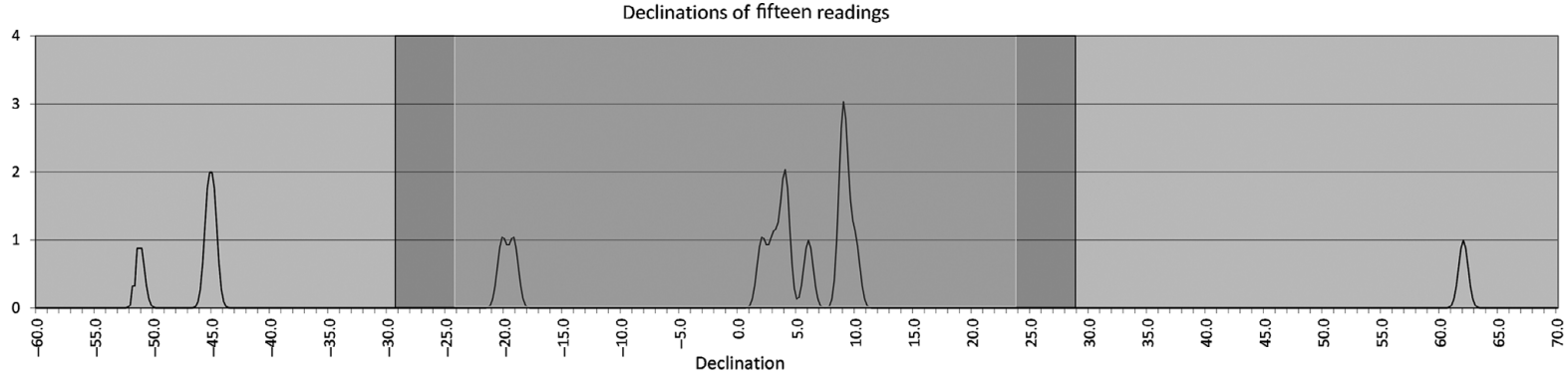
GRAPH 12. Declinations of temples dedicated to Athena from Greece and Asia Minor.



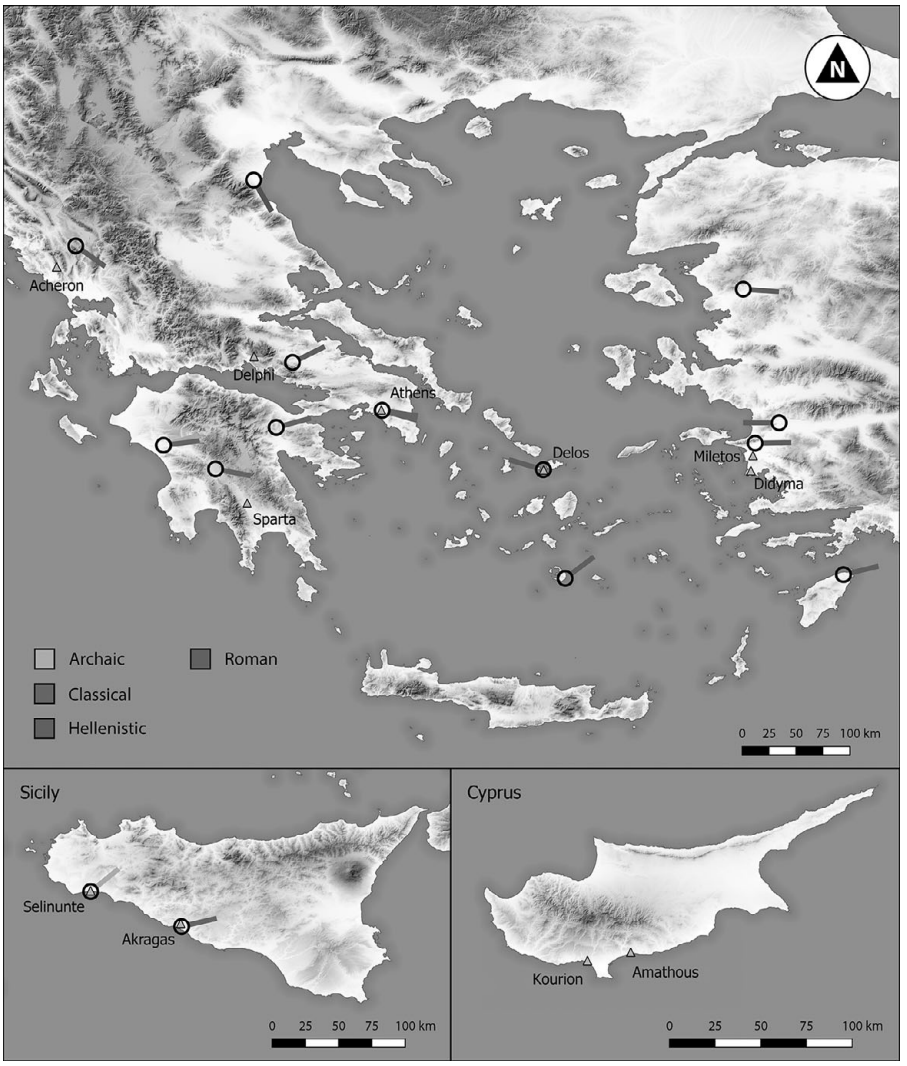
10. Distribution of fifteen temples dedicated to Hera. Fewer orientations are visible on the map, because in a number of cases temples have the same orientation and thus overlap. These include three of her four successive temples in Samos and the two successive Heraia in Delos. For colour version, see the plate section.

Similarly, the fifteen temples comprising **Hera**'s sample are located in Greece and Sicily and show a distinct preference for the eastern half of the horizon (Figure 10). The orientations range from north-east (azimuth 10° of her Limenia temple in Perachora) to due south (azimuth 180° of her Geometric temple in Tiryns), with a stronger solar preference than the temples to Athena. The majority of Hera temples (eleven) are oriented within the solar arc (Graph 13, Table 3.1).

Zeus is a well-represented deity, with nineteen readings from fifteen different cities, which include ten different cults (Polieus, Bassileus, Phratrios,

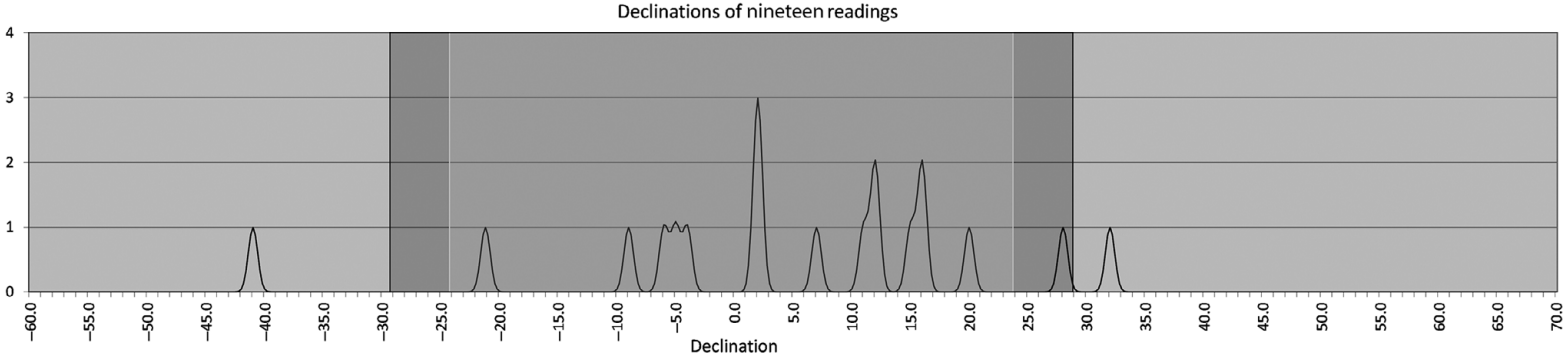


GRAPH 13. Declinations of temples dedicated to Hera from Greece and Sicily.

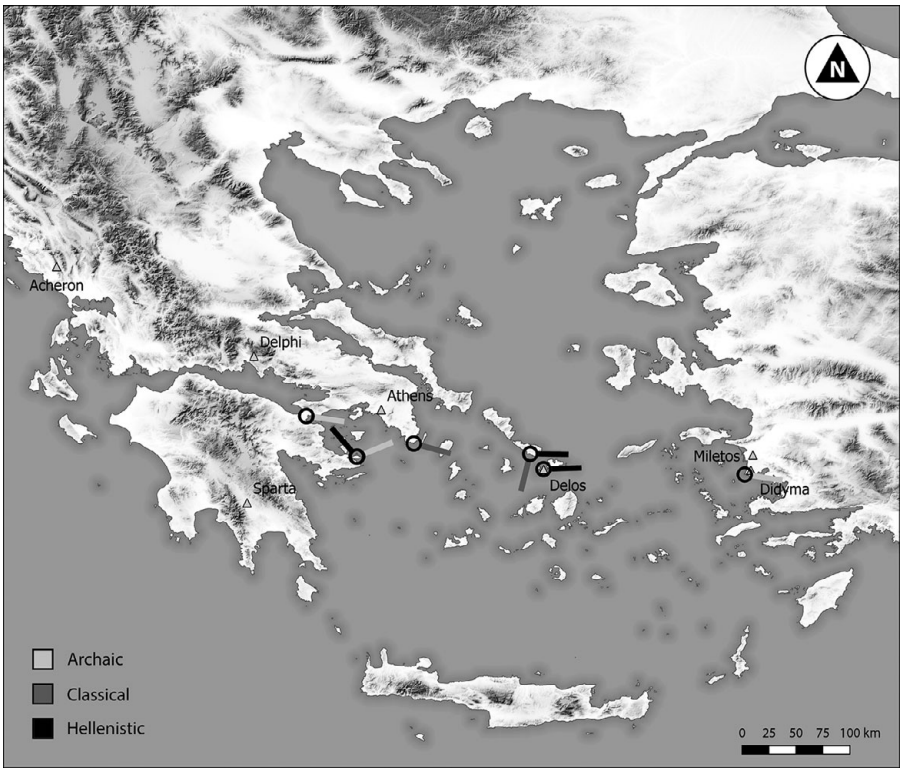


11. Distribution of nineteen temples dedicated to Zeus. For colour version, see the plate section.

Soter, Meilichios, etc.), from the Archaic to the Hellenistic periods. Only two of his temples face west (Magnesia in Asia Minor and the temple of Zeus Hypsistos on Delos' Mt Kythnos) (Figure 11). All other readings show a concentration between azimuth 51° and 150°. This is also reflected in the converted declinations, which fall within the solar range, with only three exceptions (Graph 14, Table 3.1). The peak at declination +2° comprises three different Zeus temples from the colonies: that in Priene, the temple of Zeus Sosipolis in Magnesia, and temple A in Akragas, thought to be dedicated to Zeus or Herakles. It is noteworthy that declination +28°, which falls within the major lunar limits, is the shrine of Artemidoros of Perge in ancient Thera; as it is a temple dedicated to Zeus, Artemis, and Apollo, this is not strictly a



GRAPH 14. Declinations of temples dedicated to Zeus from Greece, Asia Minor, and Sicily. Declination −41° belongs to the temple of Zeus Hypsistos in Dion and declination +32° to Zeus Meilichios in Selinous.



12. Distribution of nine temples dedicated to Poseidon. One fewer orientation is visible, because the god's two successive temples in Isthmia have a very similar orientation and overlap on the map.

Zeus orientation. A sky god, Zeus is not associated with the sun in Greek religion more than Apollo is, yet the portion of Zeus temple orientations which point within the solar arc is greater than the Apollo temples. We observed the same result also in the case of Artemis and Hera.

Finally, the **Poseidon** structures (nine from six different sites) are in their vast majority oriented E–SE, with two exceptions, and date from the Archaic to the Hellenistic periods. The two pointing differently do not belong to temples but to structures associated with the cult of Poseidon in the sanctuaries: Building B in the sanctuary of Poseidon and Amphitrite in Tenos (south at dec. -51°) and Building D at the sanctuary of Poseidon in Poros (north at dec. $+46^{\circ}$) (Figure 12).

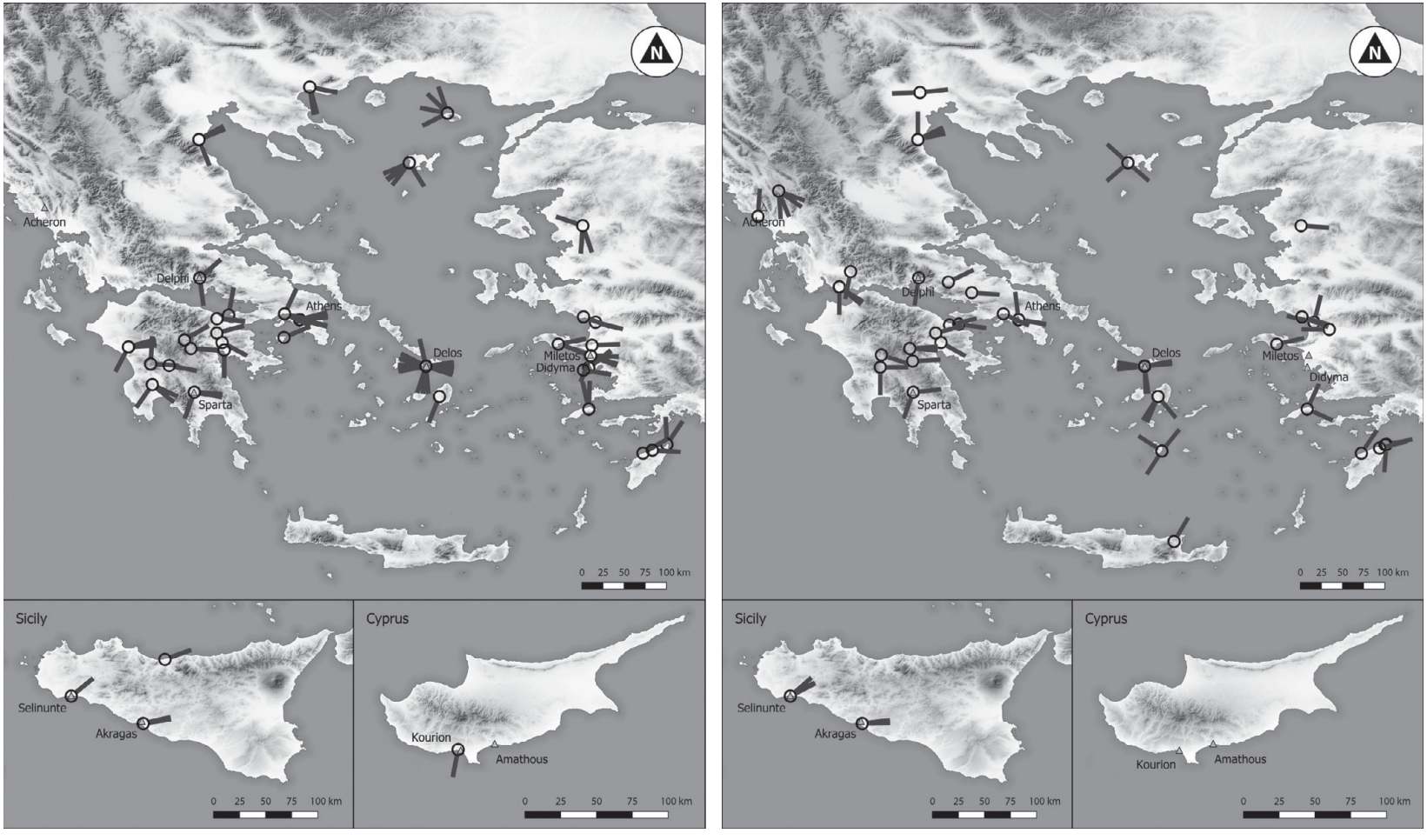
Chthonic Deities and Heroes versus Ouranic Deities

The division between chthonic and ouranic deities has been scrutinised and contested in scholarly debates. Whether or not the significance of this division is a modern construct, the analysis of religious structures based on this grouping

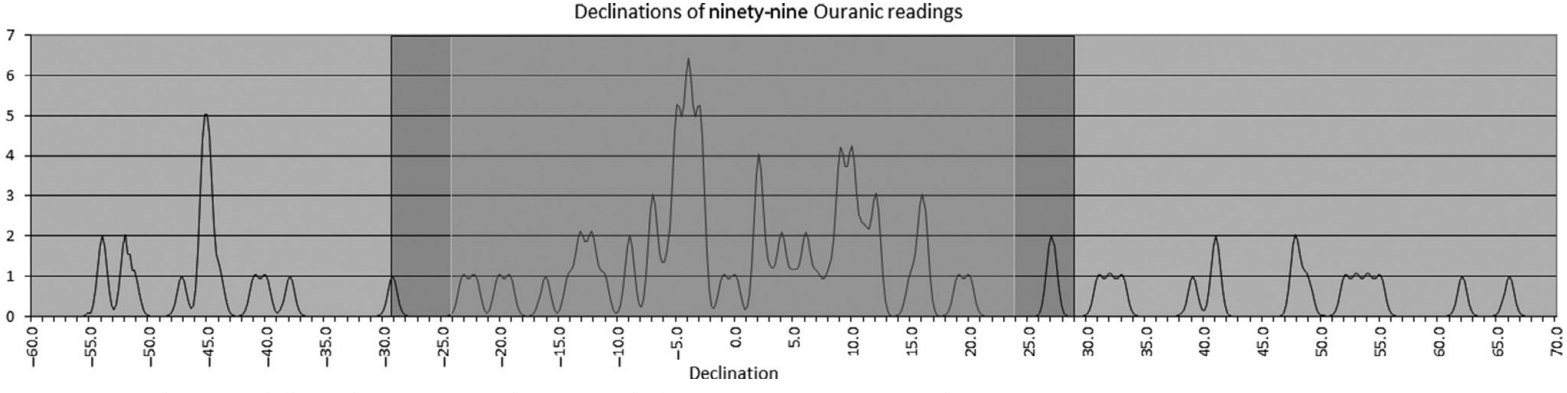
can inform us of preferential orientation patterns, which, if present, may have served the cults. This analysis stems from the idea that structures dedicated to Olympian deities should face the rising sun, whereas heroes and chthonic deities were associated with western-facing structures through their association with the underworld. It has not been possible to assign all surveyed temples to one of these groups, so the total number of structures included here is smaller than the entire data set, but it is adequate for the intended analysis and comparisons.

A general distribution of the ouranic and chthonic temple azimuth data does not indicate a particular preference for a specific part of the horizon (Figure 13). In the ouranic group 66.6 per cent (sixty-six readings) fall within the east and west solar range (Graph 15); 59.6 per cent of the ouranic group (fifty-nine orientations) faces the east (Graph 16) and seven orientations face west. The majority of the western declinations (six out of seven) are from Delos. These include most of the Apollo temples as well as the temples of Zeus and Tyche on Mt Kynthos. Compared to the 55.7 per cent of the general distribution graph falling within the eastern solar arch, it transpires that even if we separate the group of the ouranic deities, the concentration of data towards eastern orientations is not much higher than that found in the general distribution graph. Despite anticipating that structures dedicated to ouranic deities should be oriented towards the east, based on references to sacrificing to the Olympians facing the rising sun, the analysis does not demonstrate a much higher eastern percentage for these structures.

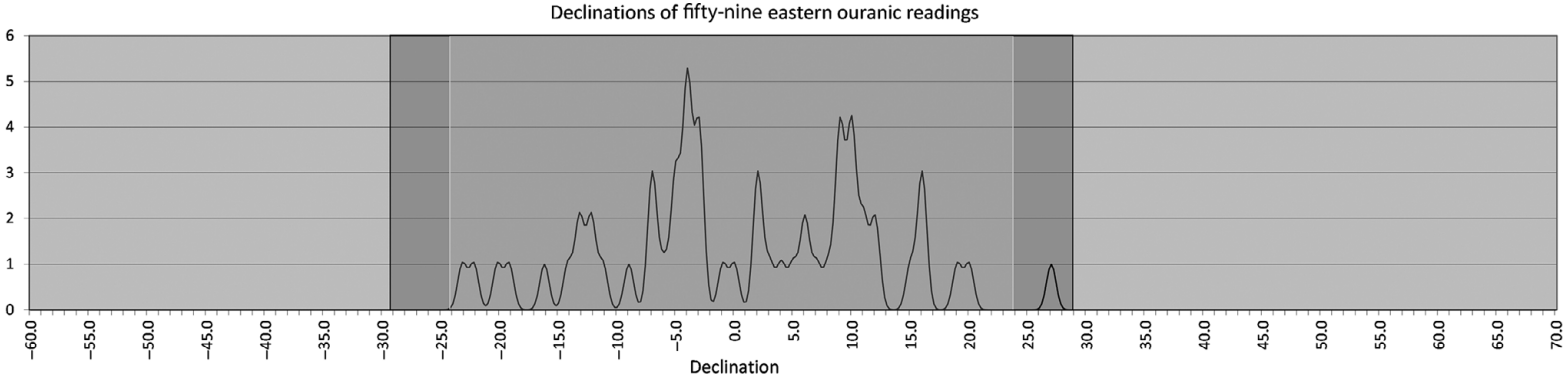
In the chthonic group (Graph 17), 57.7 per cent falls within the solar range (forty-six declinations). Of the entire chthonic sample, thirty-four structures (43.6 per cent) face towards the eastern solar range (Graph 18) and eleven (14.1 per cent of the total chthonic sample) to the west. In this group, a large number of western orientations is from Delos (four) and Ephesos (three). The chthonic deities group has a smaller overall percentage of orientations facing the solar range (57.7 per cent) as compared to the ouranic group (66.6 per cent), and contains a significantly smaller eastern orientation group (43.6 per cent) than that found in the ouranic group (59.6 per cent). Interestingly, western orientations comprise a higher percentage of the chthonic orientations (14.1 per cent) compared to the ouranic (7 per cent). The chthonic group displays an eastern peak at declinations -17° to -16°. This declination is where the star Sirius was seen to rise between 650 and 200 BCE. Otherwise, eastern orientations seem to be more or less evenly distributed within the solar range. Even if we isolate the thirteen **hero** shrines from the rest of the chthonic group, we observe no particular preference for the west (Figure 14). Another interesting observation is the comparison of the southern cluster between the ouranic and chthonic groups. The chthonic contains twenty readings (from -54° to -30°) forming two peaks between declinations -41° and -45°,



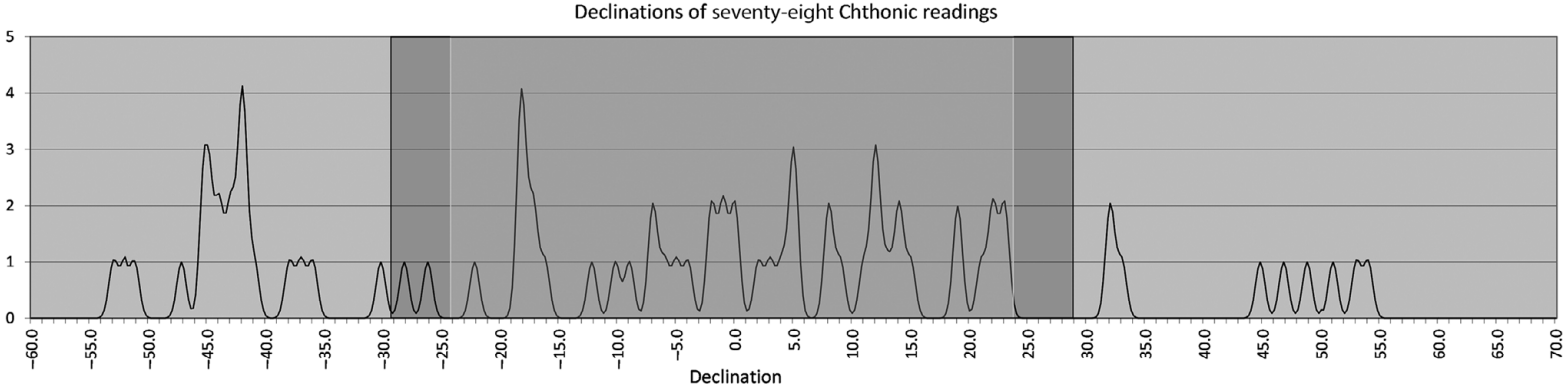
13. Comparison of azimuths between ouranic (left) and chthonic (right) cults



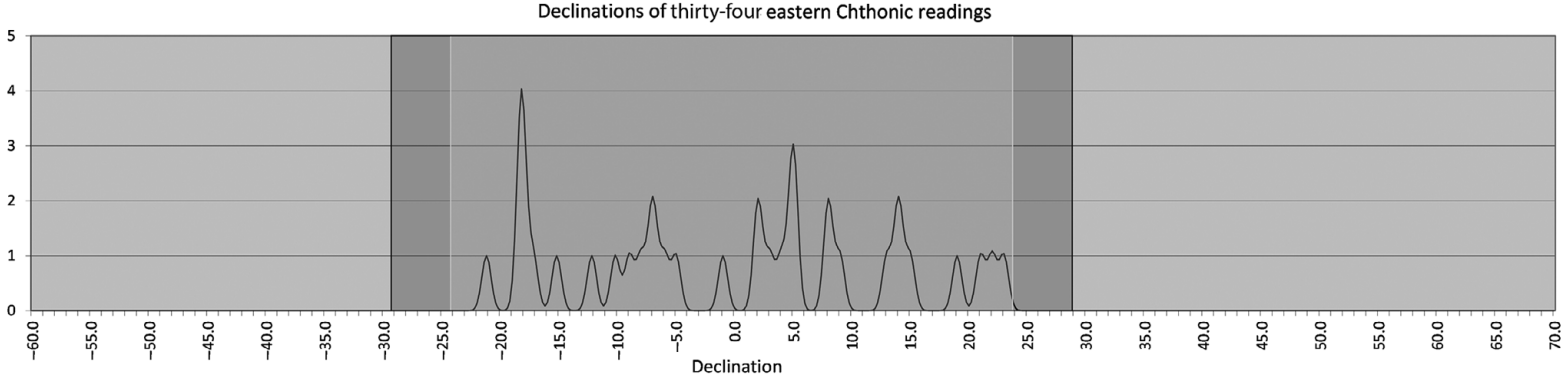
GRAPH 15. Declinations of all temples associated with ouranic cults from Greece, Asia Minor, Sicily, and Cyprus.



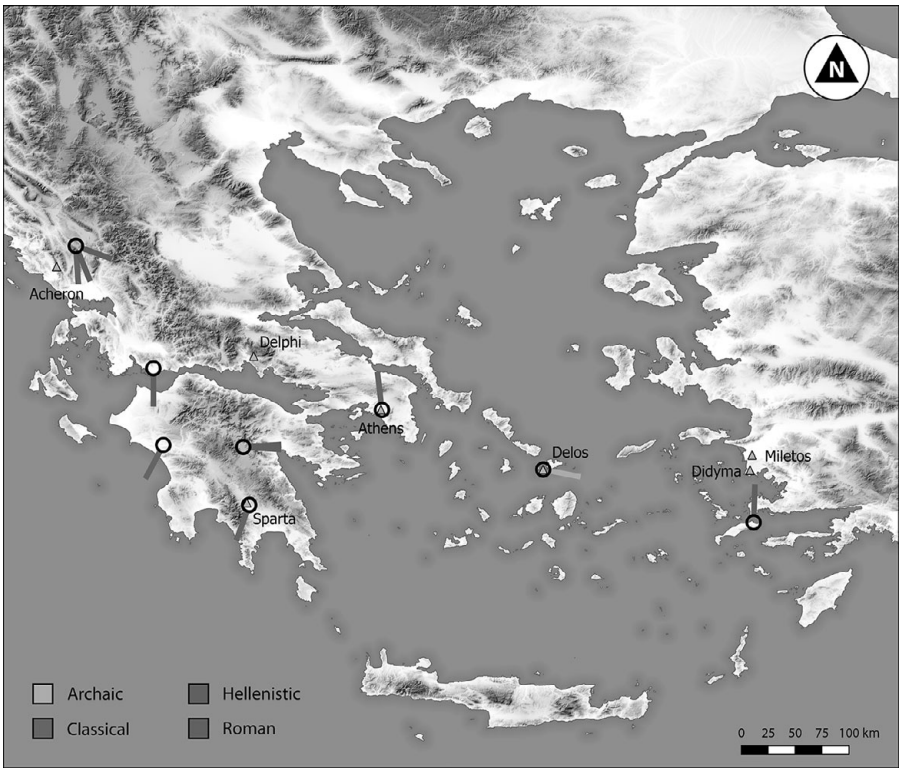
GRAPH 16. Ouranic cult declinations oriented only within the eastern solar arc.



GRAPH 17. Chthonic cult declinations from Greece, Asia Minor, and Sicily.



GRAPH 18. Chthonic declinations oriented only within the eastern solar arc from Greece, Asia Minor, and Sicily.



14. Orientations of thirteen hero shrines. A list of these structures can be found in the Appendix. For colour version, see the plate section.

whereas the respective ouranic southern cluster contains fifteen readings and a single peak at -45°. The small prevalence of western orientations in the chthonic group compared to those of the ouranic is not enough to suggest a difference in practice between the two cult groups.

DISCUSSION

The results of this analysis revolutionise current expectations of the placement of Greek temples, as the study reveals patterns of Greek temple orientations which oppose current general conception. No patterns of explicit preference appear in the data, and if certain astronomical observations did indeed govern the placement of Greek temples, then we can safely conclude that these were not practised widely across Greece. In fact, thus far the analysis does not indicate a pattern of explicit preference. It is possible that some temples were oriented towards sunrise or sunset on a specific date, but such a practice was not widespread across a region or chronological period and not associated with a specific deity. The temples which orient towards points outside the solar arc may serve as a guide to discovering what these observations may have been.

Approximately half of Greek temples seem to have been oriented towards the east. Whether this percentage is conclusive regarding the significance of eastern orientations is arguable. But if we conclude that facing the east was important in temple and altar placement, we should also seek an explanation for the criteria determining the orientation of the other half of the temples. An unexpected observation of this analysis is that among the temples to Apollo, the most obvious candidate to be associated with the rising sun, the percentage oriented to the east is actually smaller than the number of temples to Artemis, Zeus, or Hera with this orientation. The results of this study are also nuanced in regard to current belief about which groups of temples should face west. The idea that heroes and chthonic deities through their association with the underworld required western-facing structures is not validated. We can conclude with certainty that general statements in favour of temples and altars being oriented towards a specific cardinal point reflect another gross oversimplification of a much more complex practice.

Several of the case studies presented in this volume involve structures (i.e., temples and altars) whose orientations fall within the solar rising arc. Such are the temples and altars of Artemis Orthia in Sparta, the Parthenon and Great Altar in the Athenian Acropolis, etc. These orientations could be cited in support of the general conclusion that a large number of Greek temples were oriented east towards the sunrise. But such a general statement would fail to take into account further evidence suggesting that they resulted from a much tighter, more meaningful connection between structures, cult performance, experience, and astronomy. We will discuss such examples in detail in the following chapters. Most importantly, whatever the reason for a particular temple orientation, it is clear that sweeping statements (e.g., the majority of Greek temples face east) make no contribution to our understanding of Greek religious practice and experience. To understand the principles behind temple orientation in ancient Greece, we are therefore forced to look elsewhere, to a more detailed study which will advance our understanding of the role of astronomy in ancient Greek ritual experience. The following chapters lay out the principles of such a study.

FOUR

ASTRONOMY AND PERCEPTUAL COGNITION IN APOLLINE CULTS

APOLLO'S COSMIC SIGNIFICANCE

Apollo's strong solar and calendric attributes make him a particularly suitable deity for an investigation concerning astronomical links in religious spaces.[1] This relationship, which continues well into the Roman period,[2] appears in a number of texts from the fifth century BCE.[3] Many of Apollo's *epikleses* associate him with the sun: Phoebus,[4] Lykeios, Aigletes (god of light or sun, with a temple on the Aegean island of Anafi),[5] and Apollo Eos (of the Dawn).[6] In literature, the identification of Apollo as Helios (Sun) is widely attested, as are a number of cults linking the two divinities, such as Apollo Helios in Rhodes and Athens and the Boeotian Daphnephoria.[7] We will explore in this chapter how a number of Apollo's other cults employed solar associations for timekeeping purposes and for shaping the cognitive ecology of the cults, triggering the senses within the religious experience. The sun's fundamental importance in human existence stands as testimony to Apollo's cosmic significance. His importance in the Greek pantheon is well known, but the god's cosmic role is, in addition, palpable in his position as the god of music, which also carried cosmological significance through the sixth-century-BCE Pythagorean ideas of the music of the spheres.[8] Plato, in particular, explains how Apollo directs celestial and musical harmony.[9] Of particular relevance to this study is a third association of Apollo with the cosmos, his relationship with the land of the Hyperboreans, the people of the far north: a place associated, at

least in the late sources, with eternal spring and light,[10] where days were of extreme length and nights very short – an ideal ambiance for the god of light.

In the *Homeric Hymn*, Apollo, disguised as a dolphin, guides the Cretan ship first to Krissa and then to Delphi, where he founds his cult. This narrative offers an additional layer to Apollo's cosmic significance. The sea is the primary element from which all gods sprang in the main Greek cosmogonies (Homeric, Hesiodic, and Orphic).[11] The Delphic oracle of Apollo, as the centre of the world, matches the god's cosmic connotations; a new world order is established by Apollo upon founding the oracle and taking over from the old primeval, chthonic, and destructive powers of the previous occupier.[12] The cosmic significance of Delphi is confirmed in the characteristics of its two divine occupiers (Apollo and Dionysos), according to Plutarch: Dionysos' presence in Delphi was seen as symbolic of the division of the cosmos into elements,[13] with each god representing different expressions of the ever-changing cosmos. In Plutarch's analysis, the elements, characteristics, and attributes of the two gods contain cosmic referents. In the example of Delphi, we revisit the idea that places of cosmic significance act as effective carriers of memory. Delphi, as the centre of the world – a notion made explicit in myth but also in the display of the *omphalos* (navel) – was a focal place of the ancient Greek cosmic structure.

FESTIVALS AND SANCTUARIES OF APOLLO

Apollo embodies cosmological attributes not only through the above-mentioned associations, but also in his festivals, such as the Septeria and the Daphnephoria. We discussed in the previous chapter the number of the god's sanctuaries surveyed, which makes him one of the best-represented deities in this work. We saw that the general analysis of his temples did not produce distinctive data clusters which could be explained in astronomical terms, but the in-depth analysis presented in this chapter offers a different viewpoint on Apollo's cosmic significance. The cults examined here put emphasis on his role and connections with the changing of the seasons and the sun, as well as his association with the civic calendar. We investigate some of his most important sanctuaries and festivals: Delphi, Delos, Dreros, Miletos, Didyma, Klaros, and Bassae. Apollo's most important oracular sanctuaries were Delphi, Didyma, and Klaros (Table 4.1). With the consultation room located within the temple, all three fall into the temple-sanctuaries category in Friese's classification.[14] And in all three, the consultation room was separated by a change in level, through steps.[15]

Delphi and Boeotia

The seventh of Bysios was for the Delphians the most important day in the year. It was the day of the annual operation of the Delphic oracle in the early

TABLE 4.1. *Raw data for temple and altar orientations discussed in this chapter*

Location	Structure	Date	Azimuth	Altitude	Declination[a]
Bassae	Temple of Apollo Epikourios	Classical	3°	14°	+66°
	Temple of Apollo (side entrance)	Classical	93°	0.5°	−3°
Delos	Temple Γ	Geometric	347°	2°	+52°
	Altar of Horns / Horn temple	Classical	82°	3°	+8°
	Oikos of Naxians	Archaic	259°	0.5°	−9°
	Oikos of Naxians (back entrance)	Archaic	79°	2°	+10°
	Poros temple of Apollo	Archaic	265°	0.5°	−4°
	Temple of Athenians of Apollo	Classical	263°	0.5°	−5°
	Great Temple of Apollo	Classical	264°	0.5°	−5°
Delphi	Temple of Apollo	Archaic	49°	26°	+48°
	Temple of Apollo	Classical	49°	26°	+48°
Didyma	Temple of Apollo	Archaic	54°	8°	+33°
	Temple of Apollo	Hellenistic	52°	5° & 7°	+32°
Dreros	Temple of Apollo Delphinios	Geometric	30.5°	5°	+49°
Klaros	Temple of Apollo	Hellenistic	106°	13°	−4°
	Altar of Apollo	Hellenistic	107°	13°	−5°
Miletos	Delphinion	Classical on Archaic foundations	111°	2°	−16°
	Altar of Delphinion	Classical on Archaic foundations	109°	2°	−14°

Note: [a] The declinations listed are rounded to the closest degree. For the exact declination to the closest minute of arc consult the Appendix.

periods, Apollo's birthday (in Delphi),[16] and the day of his return from the land of the Hyperboreans.[17] Bysios, the eighth month of the Delphic calendar, was the first month of spring in Delphi,[18] corresponding on average to a period between our mid-February and mid-March, and thus the seventh day can be securely pinned to the second or third week of our February, on average. In exceptional years with early full moons in mid-January or late full moons in mid-February, the month would fluctuate within a twenty-day period to either side of our February, and could end in mid-March.[19]

The initial one-day-of-the-year oracle consultation, although fixed in the Delphic calendar, was far from fixed in the calendars of the other Greek poleis.

15. The temple of Apollo, Delphi, with the Phaedriades rising sharply in front of its entrance (photo by E. Boutsikas)

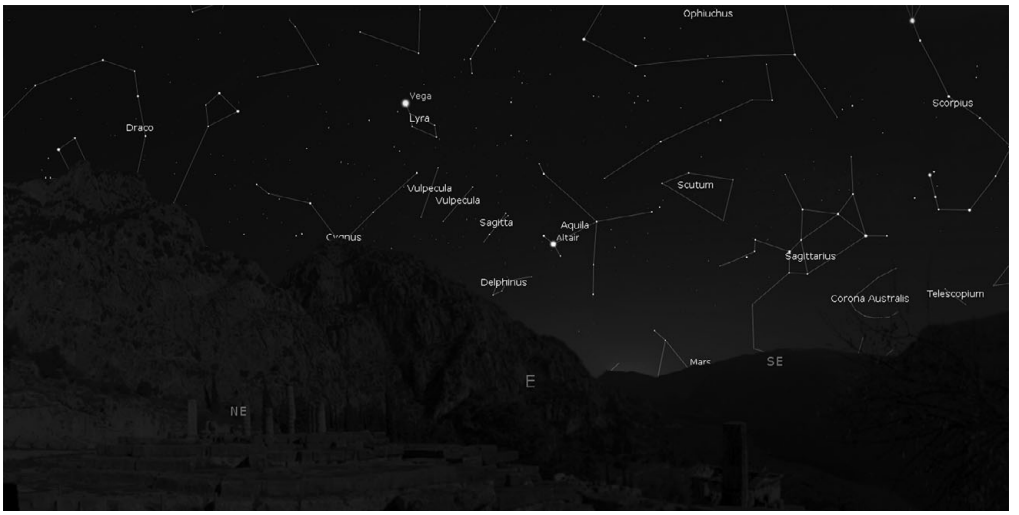
With a growing reputation and demand for consultation, the Delphic oracle operated on the seventh day of each month, but only in the nine months when Apollo was present in Delphi:[20] from Bysios to Heraios (ca. February–October). After Heraios and for the remaining three winter months (Daidaphoros–Amalios),[21] equivalent to our November–January, Dionysos took Apollo's place in Delphi and Apollo travelled to the land of the Hyperboreans,[22] where he resided until the following Bysios.[23] Supplementary evidence preserves the memory of two Hyperborean heroes, Amadokos and Hyperochos, in the Delphic sanctuary.[24]

The extant temple of Apollo in Delphi faces north-east (azimuth 49°).[25] The visible horizon from the temple's entrance is shaped by the steep and imposing Phaedriades, rising to an altitude of 23°–26°, thus greatly restricting visibility (Figure 15). No other surveyed site has such a high horizon at such proximity to the temple. This unusually high horizon delays any astronomical observations by approximately two weeks compared to an average Greek horizon (ca. 5° altitude). The temple's declination is +48°, outside the range of the sun's annual path.

It is possible to relate the position and movement of the constellation of the dolphin (Delphinus) in the night sky to the timing of the Delphic oracle's operation, the general orientation of Apollo's temple, and the oracle's foundation myth.[26] The Delphic cult was dedicated to Pythian Apollo, not Apollo Delphinios, but the importance of the dolphin is attested in Delphi in a number of ways. The first instance is the *Homeric Hymn* reference to Apollo's transformation into a dolphin to guide the Cretan sailors. This links the oracle with the animal regardless of where one stands on the etymological root of

Delphi, Delphinios, and *delphinos* (dolphin).[27] Furthermore, the animal was depicted in the Delphic coins on either side of the head of the goat. In the *Homeric Hymn*, upon arriving at Krissa, Apollo proclaims that the Cretans should worship him as Delphinios in memory of the shape he took to guide them there.[28] The consultation of the god in Delphi as a mode of government and lawgiving, a trait most commonly associated with Apollo Delphinios, affirms this relationship. In his ideal state, Plato, for instance, leaves to Apollo in Delphi the religious lawgiving.[29] An overlap between the attributes of Pythios and Delphinios appears also outside Delphi. Pythios Apollo had the role of the chief political deity in Sparta, to the extent that the epithet gave its name to a body of officials, the *Pythioi*,[30] who had close relations with the Delphic sanctuary.[31] The idea of the interchangeability of Apollo's epithets in some locations finds support in a number of examples in the ancient sources. For instance, Pausanias refers to Apollo Parrhasian's cult in the Arkadian mountains having also the epithet Pythios;[32] Demosthenes states that Apollo Pythios was honoured in Athens as Patroos;[33] on at least one occasion, at the Delian festival of Apollo, he was celebrated as both Delian and Pythian (in obedience to a Delphic oracle);[34] and at the god's Athenian shrine on the north slope of the Acropolis, he was worshipped both as Pythios and Hypoakraios.[35]

Let us consider the physical setting of Apollo's temple in Delphi. The landscape and the platform on which the temple was constructed allow little space for movement, implying that the optimal layout of the temple in relation to the landscape was the decisive factor, and that it probably dictated the temple's placement. This setting alone does not necessarily establish an association between the orientation of the temple and a given star or constellation, but the unusual orientation of the temple towards the Phaedriades, which rise sharply, the sanctuary's foundation myth, and the discussed links between the dolphin and Apollo – in conjunction with the rising point of the constellation of the dolphin (Delphinus) towards the part of the sky the temple and altar of Apollo face – create an interesting correlation worthy of further investigation. In 700–300 BCE, Delphinus was visible at declination +6° to +10°. Delphinus is a small constellation, so being able to observe concurrently both its heliacal rising and setting in the heart of winter, when bad weather is common, makes it a good candidate for timekeeping. Indeed, the constellation features in a number of *parapegmata*. Its acronychal rising and cosmical setting are recorded in the third-century-BCE Hibeh *parapegma*, as we will discuss in the following section, and its heliacal rising is listed in the Byzantine *parapegma* of Johannes Lydus, *De Mensibus*, which quotes Demokritos for this observation.[36] The outline of the constellation is described in the third-century-BCE *Phaenomena* by Aratus,[37] who based his work on fourth-century Eudoxan observations.



16. Reconstruction of the Delphic landscape and night sky at the time of Delphinus' heliacal rising (ca. 700–300 BCE). For colour version, see the plate section.

The unusually high horizon of Delphi meant that Delphinus had to climb at an altitude of ca. 23° before it was visible from that location (Figure 16). This resulted in a relatively long invisibility period, starting after the constellation was seen to set in the considerably lower western horizon just before dawn. The annual invisibility period followed, lasting in Delphi approximately three weeks (4–26 January) and ended with the return of the constellation in the eastern night sky, with the heliacal rising occurring here on 27–29 January. This happened in the second half of the Delphic month Amalios (Table 4.2), which was followed by the sacred month Bysios. Consequently, Bysios, the month of oracular consultation, was the first full month during which Delphinus was visible in the night sky in Delphi.[38] The celestial Dolphin was then always visible in Delphi's pre-dawn night sky on Apollo's birthday, the seventh of Bysios, which commenced the oracle's period of operation. If the heliacal rising of Delphinus signalled the arrival of the time for the Delphic oracle's operation,[39] then the three-week delay of the phenomenon's visibility from Delphi provided adequate time for travellers to arrive in Delphi for consultation.

The suggested connection between the movement of the constellation and the Delphic sanctuary can be also supported by the timing of Apollo's presence in Delphi. We mentioned that in later years, the Delphic oracle operated on the seventh day of every month starting from Bysios and continuing for the following nine months, a time that Apollo was believed to be present in Delphi. These nine months are also the months in which Delphinus was visible in the Delphic night sky, and the three winter months of Apollo's absence from Delphi are also the months when Delphinus was seen to slowly

TABLE 4.2. *Comparison of the timings between religious events of Apollo in Delphi and the movement of Delphinus*

Attic months	Delphic months	Relevant Apollo festivals	Movement of Delphinus	Gregorian months
(1) Hekatombaion	(1) Apellaios		**Cosmical setting** (10–11 Aug.)	July–August
Metageitnion	Boukatios	Pythia, Delphi (7th)		August–September
Boedromion	Boathoös			September–October
Pyanepsion	Heraios			October–November
Maimakterion	Daidaphorios ***Apollo absent***			November–December
Poseideon	Poitropios ***Apollo absent***		**Helical rising** (30–31 Dec.) **Helical setting** (2–3 Jan.) *Delphi invisibility period: 4–30 Jan.* ***Helical rising in Delphi*** *(27–29 Jan.)*	December–January **winter solstice**
Gamelion	Amalios ***Apollo absent***			January–February
Anthesterion	Bysios	Delphic oracle operation (7th) Apollo's birthday, Delphi (7th)		February–March
Elaphebolion	Theoxenios			March–April
Mounychion	Edyspoitropios			April–May
Thargelion	Herakleios		**Acronychal rising** (2–3 June)	May–June
Skirophorion	Ilaios		***Acronychal rising in Delphi*** *(22–23 June)*	June–July **summer solstice**

disappear. From the end of September (ca. Boathoös), Delphinus was already low in the western sky by the time it became visible after sunset and was only seen to set at night in the north-west, until it stopped being visible for its nearly month-long invisibility period. This was the last month of Apollo's absence from Delphi. Thus, at the same time as Apollo's absence from Delphi and his stay in the land of the far north, Delphinus is seen to set in the north-west, or is invisible, until they both return after the winter solstice, in Bysios. Other Apollo festivals celebrated in Delphi can also be tied to the movement of Delphinus. The Pythia was held in the second month of the Delphic calendar,

Boukatios.[40] This was the first month after Delphinus' cosmical setting was observed in the horizon (Table 4.2).

Alkaios connects Apollo's return with the god's return from the Tempe, celebrated every eight years in the Daphnephoria festival.[41] The festival was celebrated in Delphi and Thebes, but the two rites differed considerably. The Delphic Daphnephoria, which was part of the *enneateric* Septeria festival,[42] involved a procession to the Tempe. After offering sacrifices, this procession returned to Delphi.[43] The Septeria marked Apollo's departure for the Tempe in order to be purified for the killing of Python; the Daphnephoria marked the conclusion of the set of rites which commenced in the Septeria and Apollo's return from the Tempe. This was celebrated probably in Ilaios or, alternatively, in Boukatios (June–July).[44] During the ritual re-enactment of the festival of Septeria, the boy leading the procession from Tempe to Delphi arrived in Delphi in another procession in order to be purified following the ritual re-enactment of the slaying of Python.[45] The Daphnephoria was celebrated mostly in Delphi, Thebes, and Tempe. The festival's astronomical and cosmological character is apparent in its Theban version, held probably in spring,[46] in honour of Apollo Ismenios or Galaxios. The festival was probably celebrated in the same month and on the same day as its Delphic counterpart,[47] and had clear connections with the Delphic rite.[48] In the Theban festival, a boy, impersonating Apollo, and his closest relative led a procession. According to Proklos' festival description, the boy's relative led the procession, holding an olive tree branch with garlands of laurel and flowers twined around it.[49] At the top of the branch a bronze globe was attached, from which several smaller bronze globes were suspended. In the centre of the branch was another bronze globe, smaller than the one on the top, to which 365 red garlands were attached. Proklos notes that the large globe symbolised the sun, also referred to as Apollo, conceived in this context as a solar god.[50] The smaller globe symbolised the moon, the numerous globes suspended from the big sphere symbolised the stars, and the garlands indicated the course of the year. This procession is seen as the symbolic re-enactment of the procession of time, the seasons and the alternation of light (large sun sphere) and night/darkness (small moon sphere and multiple smaller star spheres).[51] Consensus is that the Septeria and Daphnephoria (in Delphi and Thebes) were celebrated in late spring–early summer,[52] in the Attic month Thargelion. Farnell places the return of the boy from the Tempe to Delphi during the Delphic Septeria in late spring–early summer, reasoning that the laurels the boy brought back from the Tempe were to be used for Pythian victor crowns.[53] The Theban Daphnephoria is viewed as a celebration of the regeneration of nature, bearing also solar and cosmological connotations.[54] We discussed in Chapter 1 the astronomical significance of the eight-year cycle and the astronomical connotations present in the procession.[55] Aside from this luni-solar link to the festival, this time

(ca. June) coincides also with Delphinus' acronychal rising and the summer solstice, marking the longest days of the year – an appropriate time for the god of light (Table 4.2).[56]

These events take place during a transitional time, which we will see again in other cults of Apollo. In Athens, Plato associates the 'common precincts of Helios and Apollo' with a festival related to the summer solstice.[57] A few lines later, Plato describes how in that precinct three men should be consecrated jointly to Apollo and Helios.[58] These references associating Helios and Apollo have been taken as evidence of a common identity shared between Apollo and the sun, or as indicating that the two are similar enough to not be distinguished.[59]

Attica

In Athens, a sky-watching custom was practised in connection with the operation of the Delphic oracle. In the fourth century BCE, the group of the Pythaistai watched the sky from the precinct of Zeus Asteropaeus (of the Thunder) in the area close to the Pythion for three days and nights in three consecutive months, in anticipation of a divine sign (lightning) allowing the Athenian delegation to depart for Delphi.[60] Epigraphic evidence confirms Apollo as the deity of the Pythaistai,[61] and an inscription places the beginning of the watch in late Boedromion (October),[62] with its end sometime between the end of Poseideon and the beginning of Gamelion (January). The Pythaistai were observing in the direction of Harma,[63] which Strabo locates in the Tanagraean territory, in Boeotia,[64] meaning that they observed the north-west section of the night sky. The chances of seeing lightning in Greece on three consecutive days of a month for three months are not high; an extended period of observation would be needed in order to maximise the possibility of observing meteorological phenomena. Indeed, inscriptions attest that the lightning did not occur in most years during the days the Pythaistai watched the sky,[65] but the grounds on which the procession departed on these occasions is not known. The spacing of this watch recalls astronomical observations: one watches for three days; if the phenomenon sought does not become visible, the watch is repeated a few days later, at regular intervals, until the desired phenomenon or celestial marker becomes visible. Strikingly, the end of the Pythaistai watch period overlaps with Delphinus' heliacal rising and heliacal setting as visible in lower horizons, such as that of Athens (Table 4.3). The time of the watch, in October–January, is also the time of the year when Delphinus is seen to set to the north-west, in the direction the Pythaistai were observing, until its heliacal rising (in the east) and heliacal setting (in the west) occur in the Attic horizon in early January, a few days after the summer solstice (Table 4.3).

TABLE 4.3. *Religious events of Apollo in Delphi and Attica in relation to the movement of Delphinus and the solstices*

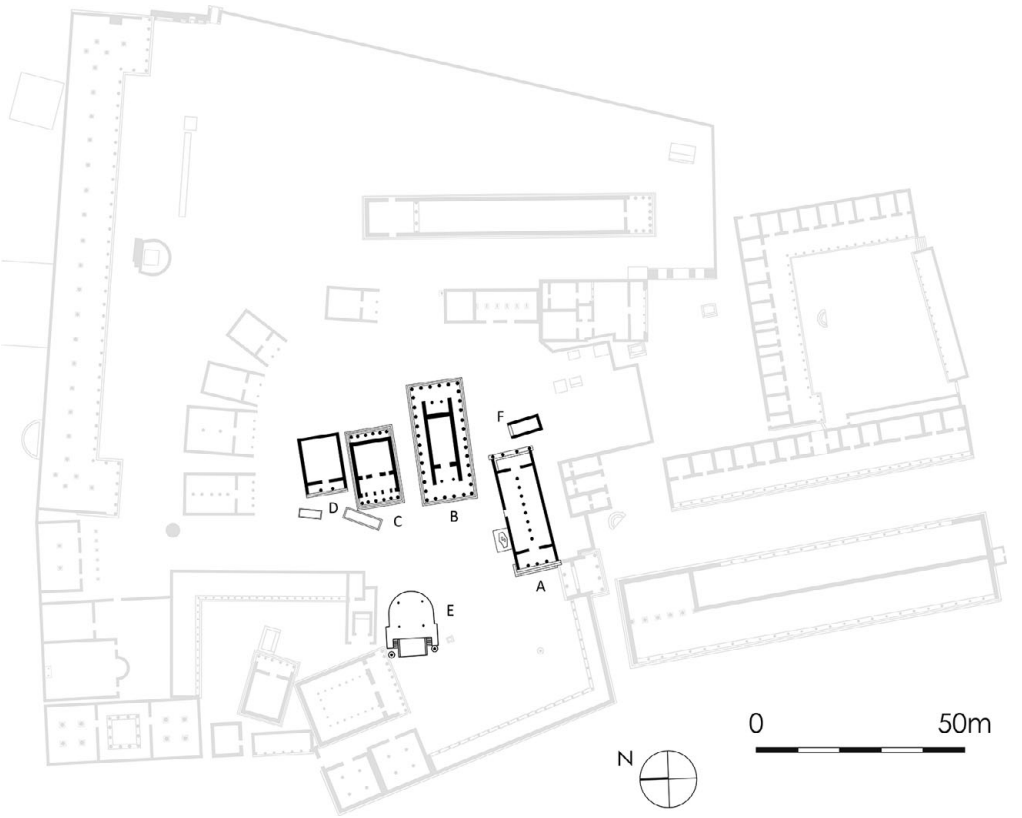
Attic months	Delphic months	Relevant festivals	Movement of Delphinus	Gregorian months
(1) Hekatombaion	(1) Apellaios		**Cosmical Setting** (10–11 Aug.)	July–August
Metageitnion	Boukatios	Pythia, Delphi (7th)		August–September
Boedromion	Boathoös	*Beginning of Pythaistai watch (23rd–25th)*		September–October
Pyanepsion	Heraios			October–November
Maimakterion	Daidaphorios ***Apollo absent***			November–December
Poseideon	Poitropios ***Apollo absent***	*End of Pythaistai watch (end of month)*	**Helical rising** (30–31 Dec.) **Helical setting** (2–3 Jan.) *Delphi invisibility period: 4–30 Jan.*	December–January **winter solstice**
Gamelion	Amalios ***Apollo absent***	Sacrifices to Apollo Delphinios, Lykeios, etc., Erchia (7th–8th)	***Helical rising in Delphi*** *(27–29 Jan.)*	January–February
Anthesterion	Bysios	Delphic oracle operation (7th) Apollo's birthday, Delphi (7th)		February–March
Elaphebolion	Theoxenios			March–April
Mounychion	Edyspoitropios	Delphinia, Athens (6th)		April–May
Thargelion	Herakleios	Sacrifice to Apollo Pythios, Erchia (4th) Thargelia, Athens (7th) Daphnephoria, Delphi, and Thebes	**Acronychal rising** (2–3 June)	May–June
Skirophorion	Ilaios	Daphnephoria, Delphi Septeria, Delphi	***Acronychal rising in Delphi*** *(22–23 June)*	June–July **summer solstice**

Erchia provides another interesting occurrence. After offering sacrifices to Apollo Delphinios (among other gods) on 7–8 Gamelion (second half of January) (Table 4.3),[66] a procession departed Erchia for the annual consultation of the Delphic oracle. The Erchian sacrifices and the end of the Pythaistai watch were completed a month prior to the oracle's operation.[67] This timing offered the necessary temporal window for the departure preparations to take place and the procession to arrive in Delphi in time for the consultation. If the end of the Pythaistai watch at the end of Poseideon and the Erchian sacrifices in the following week (at the beginning of the next month) were signalled by Delphinus' heliacal rising and/or setting, this observation functioned as a time marker, facilitating participation in a Panhellenic occurrence in a world of different calendars, month names, and intercalations. The rising and setting was visible in Attica approximately three weeks earlier than at the Delphic sanctuary. The timing of this observance would differ slightly depending on the horizon of the local landscape from which the observation was anticipated, but it is unlikely that it would have been delayed by more than ten days in locations with a higher horizon. Consulters travelling to Delphi had then two to four weeks to arrive at the oracle before the consultation.

The end of the Pythaistai watch, the timing of the Erchian sacrifices to Apollo (in Gamelion and Thargelion), the Thargelia in Athens, and perhaps the timing of the Daphnephoria (in Thebes and Delphi) overlap with three of the four astronomical phases of Delphinus: the heliacal rising and setting at the end of Poseideon or the beginning of Gamelion, and the acronychal rising in Thargelion (Table 4.3). The importance and use of these astronomical events of Delphinus in Greek timekeeping can be asserted on two occurrences: the third-century-BCE Hibeh 27 *parapegma* lists the acronychal rising of Delphinus on the eleventh day of the month Pharmouthi, and the same observation is listed also in Geminos' first-century-CE collection of *parapegmata*, quoting fourth-century Eudoxos for this observation. Similarly, the constellation's cosmical setting is listed in Hibeh 27 and Geminos, quoting Euktemon for this observation.[68] It is worth noting that the timing of the Athenian Delphinia cannot be associated with the movement of the constellation (Table 4.3), but the festival's foundation myth was linked more closely with Theseus, who gave offerings to Apollo Delphinios before setting off to slay the Minotaur.[69] It is possible that the timing of this festival was associated with different occurrences, such as perhaps the first full month after the spring equinox, a timing discussed further in this chapter when we examine the Apolline festival of Miletos and Didyma.

Delos

The premise of Delphinus' association with the timing of religious occurrences associated with the Delphic cult calls for the examination of other such possible



17. Ground plan of the sanctuary of Apollo in Delos. A. *Oikos* of the Naxians, B. Temple of Apollo, C. Temple of Athenians, D. Porinos Naos, E. Altar of Horns (*Keraton*), F. Temple Γ (adapted after Bruneau and Ducat 2005 by Lloyd Bosworth)

occurrences in other major sanctuaries of Apollo, particularly those which can be linked to Delphi and the Delphic foundation myth. Delos, the second most important sanctuary of the god, which (like Delphi) provided the hearths of Greece with pure fire,[70] is a good such example. Delos was believed to have been the location of Apollo's first oracle,[71] yet no surviving evidence supports the idea of an operating oracle there in historic times.[72] The three Apollo temples in Delos are oriented south-west, in almost the opposite direction of the Delphic temple. The earlier *Oikos* of the Naxians had a similarly oriented axis (Figure 17), but having three entrances, it was open towards the east and west. The third door, on the temple's north wall, led to the open space in front of the later temples of Apollo and the area of the altar (Figure 17). Apollo does not seem to arrive in Delos before the ninth century BCE.[73] The Geometric Temple Γ located to the east of the *Oikos* of the Naxians had a north–south axis and an entrance on the north wall, which the excavators believe to have been the most ancient (Figure 17).[74] The early phase of the *Oikos* is dated to the first quarter of the sixth century BCE and the second, extant structure to

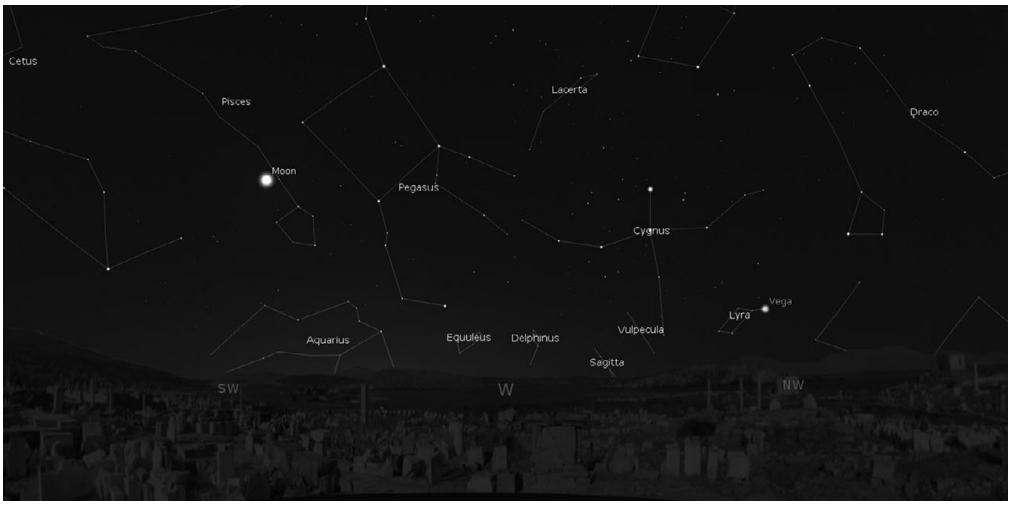
just before 550 BCE.[75] The main entrance was that to the west, as it had a *distyle in antis pronaos*, and the east porch seems to have been an afterthought of the mid-sixth century BCE.[76]

This change in orientation, from north in the earlier temple to west in the later temples, denotes a focal shift towards a sacred area or relic, which may also be confirmed by the position of the Kolossos of the Naxians outside the *Oikos*' north entrance and facing the same direction (Figure 17).[77] This sacred area was probably the Altar of Horns,[78] the most significant altar on the island, believed to have been marked out by Apollo using the horns of sacrificed goats, and to have been comprised of the horns of sacrificed animals at the time of Theseus.[79] The significance of the altar is also confirmed by testimonies referring to the very old and curious *geranos* (crane) dance performed there since the time of Theseus,[80] and also by its architecture: the apsidal structure, oriented also to the west, which apparently lacked walls but was covered by a canopy, is argued to have functioned both as an altar of Apollo (its front part being used as sacrificial space) and as a shelter for a relic.[81] There is little doubt that the area in front of the temples and the *Keraton* altar was the focal point of cult activity and ritual performance. Additionally, another altar, dedicated to Apollo Genetor, was located 'behind the *Keraton* altar';[82] it was referred to as the most ancient altar.[83]

The north-west orientation of the temples is very similar to the orientation of Apollo's Bassae temple side entrance and his temple and altar at the oracle of Klaros (Table 4.1). The declination of the three Delian Apollo temples is -4° to -5° and that of the *Oikos* -9°, which is 10°–15° away from Delphinus' apparent setting point in antiquity. Being oriented to almost the opposite direction to the Delphic temple, the Delian temple orientations point towards the section of the night sky where Delphinus was seen to set and close to the position of the sun within a few days of the equinoxes (Table 4.1 and Figure 18).

As in Delphi, Apollo returns from the Hyperboreans to Delos for his festival and departs from Delos at the same time as from Delphi,[84] meaning that there is also an overlap in both places of the months of his absence, from the Delian Aremision to Hieros (Table 4.4).[85] Conversely, Apollo's birthday in Delos was, contrary to its timing in Delphi, on the seventh of Thargelion (May–June),[86] but it coincided exactly with the time of Delphinus' acronychal rising (Table 4.4), which, thanks to the low eastern horizon of Delos, was visible with no delay.

The most important Delian festival, the Delia and/or Apollonia,[87] was probably held in the month Hieros (February–March),[88] or in the month of Apollo's Delian birthday, Thargelion.[89] The idea of the Delia being held in spring may also be tentatively supported in Thucydides' mention that the first festival the Athenians held after the purification of Delos (carried out during the winter) was the *pentaeteric* Delia.[90] If held in Thargelion, the festival would



18. Reconstruction of the Delian landscape and night sky in front of Apollo's temples at the time of Delphinus' heliacal setting (ca. 700–300 BCE). For colour version, see the plate section.

coincide with Delphinus' acronychal rising and with the possible astronomical connotations of the crane dance we discussed in Chapter 1, but Hieros, favoured by most scholars, cannot be linked with the movement of Delphinus. This is the time of the spring equinox, which, as we saw, also coincides with the orientation of the temples of Apollo. We also saw that the Pythaistai group and the Erchian sacrifices prior to the departure for Delphi could have used Delphinus' movement as a warning sign. For the Delia, Lewis Farnell argued that the choruses sent to Delos by the Greek cities must have departed well in advance of the festival and, after examining ancient sources, concluded that the cities would need to start preparing for the departure of the choruses in early spring,[91] sometime between February and March. This means that, as in the case of the Pythaistai watch in Athens, the preparations for the departure to the Delia would commence in the first full month following Delphinus' heliacal rising and setting.[92] The sacrificial calendar of Athens concurs with this timing; it records the departure of the *theôria* for Delos in early Anthesterion,[93] at the most one and a half months after Delphinus' heliacal rising and setting as observed in the Attic horizon (Table 4.4).

The patterns of preparatory activities for attending Delian and Delphic religious occurrences and the general direction of the temples in both locations can thus be linked with the constellation of Delphinus and important annual solar events. A further similarity occurs in literature. In a myth preserved by Kallimachos and Apollodoros, Asteria (She-Star), the daughter of Koeos and Phoebe and therefore Leto's sister, leaps from heaven in an attempt to avoid Zeus' advances, taking the shape of a star. Upon her arrival on earth, she becomes Delos.[94] This reference has been used to link Asteria with the deity of

TABLE 4.4. *Religious events of Apollo in Delphi, Attica, and Delos in relation to the movement of Delphinus and the solstices*

Attic months	Delphic months	Delian months	Relevant festivals	Movement of Delphinus	Gregorian months
(1) Hekatombaion	(1) Apellaios	Hekatombaion		**Cosmical setting** (10–11 Aug.)	July–August
Metageitnion	Boukatios	Metageitnion	Pythia, Delphi (7th)		August–September
Boedromion	Boathoös	Bouphonion	*Beginning of Pythaistai watch (23rd–25th)*		September–October
Pyanepsion	Heraios	Apatourion			October–November
Maimakterion	Daidaphorios	Aresion ***Apollo absent***			November–December
Poseideon	Poitropios	Posideon ***Apollo absent***	*End of Pythaistai watch (end of month)*	**Helical rising** (30–31 Dec.) **Helical setting** (2–3 Jan.) *Delphi invisibility period: 4–30 Jan.*	December–January **winter solstice**
Gamelion	Amalios	(1) Lenaion ***Apollo absent***	Sacrifices to Apollo Delphinios, Lykeios, etc., Erchia (7–8th) Cities start preparing choruses to depart for Delia	***Helical rising in Delphi*** *(27–29 Jan.)*	January–February
Anthesterion	Bysios	Hieros	Delphic oracle operation (7th) Apollo's birthday, Delphi (7th) *Theôria* depart Athens for Delos beginning of month *Delia/Apollonia, Delos?*		February–March

(continued)

TABLE 4.4. *(continued)*

Attic months	Delphic months	Delian months	Relevant festivals	Movement of Delphinus	Gregorian months
Elaphebolion	Theoxenios	Galaxion			March–April
Mounychion	Edyspoitropios	Artemision	Delphinia, Athens (6th)		April–May
Thargelion	Herakleios	Thargelion	Sacrifice to Apollo, Erchia (4th) Thargelia, Athens (7th) Apollo's birthday, Delos (7th) Daphnephoria, Delphi, and Thebes	**Acronychal rising** (2–3 June)	May–June
Skirophorion	Ilaios	Panimos	Daphnephoria, Delphi Septeria, Delphi	***Acronychal rising in Delphi*** *(22–23 June)*	June–July **summer solstice**

the Delian altar,[95] but it also means that the temples of both Delphi and Delos are oriented towards altars dedicated to divinities who in the foundation myths changed temporarily to a star before landing on the location where the cult was founded: Apollo also leaps from the Cretan boat to land on Krissa and Delphi in the form of a star.[96]

Dreros

The *Homeric Hymn* identifies the early founders of the Delphic cult as Cretan sailors. The links between the two locations are documented from at least the seventh century BCE. The link with Crete finds support in the presence of tripods and double axes at the sanctuary of Apollo in Delphi. In particular, Catherine Morgan notes the arrival of Cretan tripods as votive offerings, which, in conjunction with other offerings, she associates with the establishment of the oracle.[97] The sanctuary of Apollo Delphinios in Dreros is one of the god's earliest cult places and contains the only surviving temple of Apollo Delphinios in Crete. The structure called Delphinion in this study is the one named Delphinion by Spyridon Marinatos in the mid-1930s. Ernst Kirsten and Katja Sporn disputed this identification,[98] linking this temple to Pythian Apollo and locating the Delphinion in the larger structure excavated by Stephanos Xanthoudides on the western acropolis.[99] There is a great degree

19. Dreros temple north-east horizon profile (photo by E. Boutsikas)

of uncertainty in this latter identification, so this analysis considers only the former structure.

The Delphinion of Dreros faces away from the other structures in the area, and is oriented towards the north-east.[100] The temple has an interior altar in the south-west corner, which has yielded deposits of goat horns and three bronze figures of Apollo, Artemis, and Leto, which had perhaps been placed on the altar or adjacent bench, facing the entrance.[101] Due to their size, it is very likely that these figurines were portable, able to be carried within or indeed outside the temple during religious procedures.[102] Goats are present in Dreros in a similar context to the Delian Altar of Horns and are also present in the Delphic cult and myths.[103] The landscape of Dreros and the orientation of Apollo's temple are comparable to those of Delphi. Dreros lies between mountains to the east and west, on the southern slopes of Mt Kadiston. The Delphinion is, like the temple of Apollo at Delphi, surrounded by high horizons to the east, north, and west (Figure 19) and is similarly close to the sea, but with no sea views. Architecturally, the temples of the two sanctuaries are very different, having been constructed three centuries apart (although the Delphic temple rests on the foundations of its Archaic predecessor), but both temples share a similar orientation to the north-east (the azimuth of the Delphic temple is 49° and that of Dreros 30°). The earliest Apollo temples considered here, Delphi, Dreros, and the Delian temple *Γ*, have comparable declinations (Table 4.1). The north-east horizon altitude of the sanctuary of Apollo in Dreros is 5°, which means that the heliacal rising of Delphinus would have been observed on 7–8 January, as in all other locations apart from Delphi. Although the Dreros temple has a similar orientation to Delphi, the much lower horizon altitude rendered Delphinus visible here much earlier than in Delphi. Similarly, the temple of Pythian Apollo in Cretan Gortyn has an approximate azimuth of 278° (altitude 2°), with a resulting declination of +7°.[104] The azimuth is very close to those of the Delian temples of Apollo and the declination is within 2° of the constellation of Delphinus.

Our knowledge of the Cretan calendar is terribly incomplete. We do not know the time of the year's beginning in ancient Dreros, nor do we know whether all Cretan cities started their year at the same time. The fragmentary calendar of the Cretan city Olous, ca. 17 km to the east of Dreros, displays a month of Delphinios,[105] which Chaniotis tentatively places sometime between March and April.[106] If correct, this month would fall at the opening of the sailing season in the earlier periods.[107] It cannot be linked with the movement of Delphinus as visible from the horizon of Dreros, but rather with the spring equinox.

Miletos and Didyma

According to Lucian, a number of Apollo's oracles in Asia Minor had procedures similar to those of Delphi: Kolophon (i.e., Klaros), Xanthos (i.e., Patara), Delos, and Branchidae (i.e., Didyma).[108] Didyma and Klaros were, along with Miletos, among the most prominent sanctuaries of Apollo in the ancient world. The earliest date at which we encounter the Delphinios cult in Miletos is the sixth century BCE. Proto-Geometric, Geometric, and Mycenaean finds are absent.[109] Considerable uncertainty surrounds the origin of the cult of Apollo in Didyma and Miletos. It may have arrived with the Ionians or it may have been an indigenous cult originating in the interior of Asia Minor, having adopted the attributes and name of Apollo after the Ionian arrival.[110] Whichever interpretation is accepted, consensus is that the cult was influenced by indigenous traditions. The Greek presence dates to at least the Archaic period, but the cult itself stems from Anatolian culture or at least seems to have had a longer tradition at Didyma.[111]

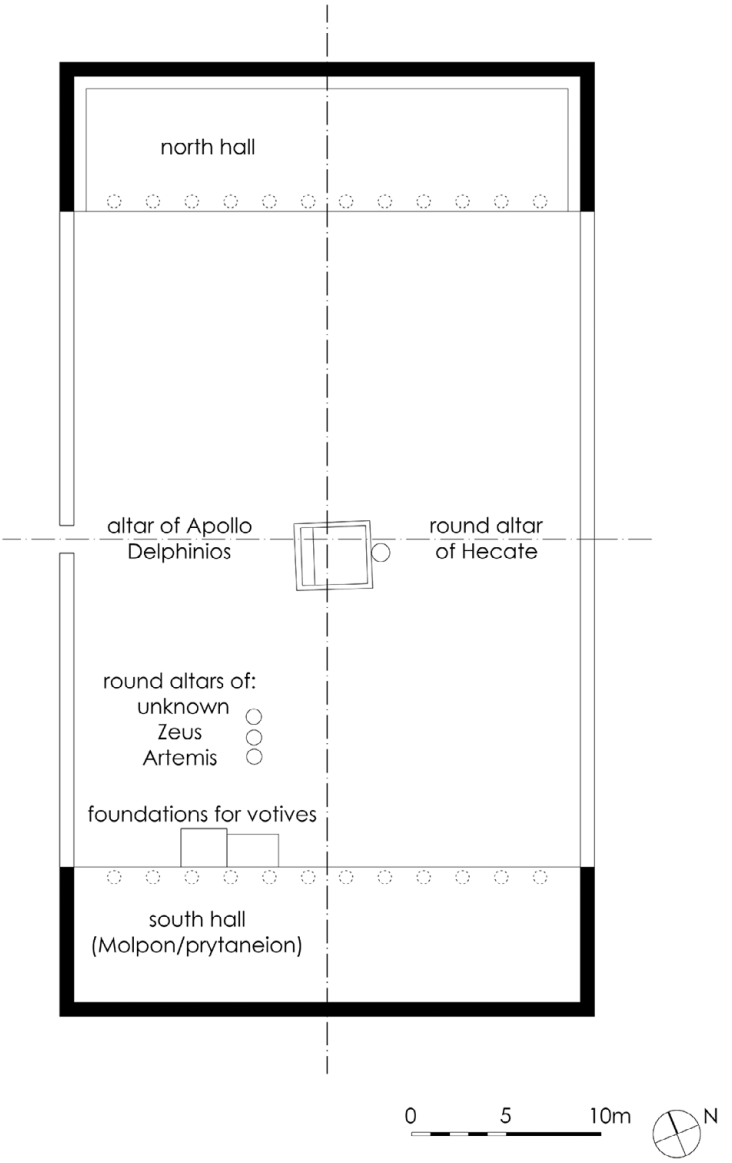
The foundation myth of Miletos and Didyma incorporates the Greek idea of Apollo arriving from Delos by means of a dolphin (riding it in this case).[112] Milesian Apollo was worshipped as Delphinios, whereas in Didyma he was jointly Didymaeus and Delphinios. The major annual festivals of the two cities connected the two cults in what was celebrated as the Milesian new year festival, dedicated to Apollo. Following the sacrifices and ceremonies on 7–10 Taureon, a procession departed from the Miletos city Delphinion; following the sacred way, it terminated in Didyma on 11 Taureon.[113] The celebrations continued in Didyma with sacrifices to Apollo in what then became the festival of Boiegia/Didymeia.[114]

Alexander Herda has argued that Taureon was the first month of the Milesian year, at least from early Archaic times onwards,[115] against earlier assertions that a reformation of the Milesian calendar took place in the fourth century BCE, which changed the beginning of the Milesian year from the autumn equinox to the spring equinox.[116] Our knowledge of the pre-fourth-century Milesian calendar is insufficient to confirm the consequences of this

change for the timing of the Milesian new year festival, forcing the present analysis to limit itself to the fourth century BCE onwards. Taureon started on the first new moon after the spring equinox,[117] in April–May, and could thus coincide with the Cretan month Delphinios in Olous.

The early altar of Apollo Delphinios in Miletos is believed to have been located on the eastern seaside of the bay, but the rise of the sea level to the west forced the relocation of the altar.[118] The Delphinion of Miletos did not conform to the typical Greek temple layout. In its Archaic and Classical form, it was a hypaethral enclosure with an altar in its centre. In the Hellenistic period, the altar was surrounded on all four sides by Doric porticoes (called Halls) with the enclosed space occupied by unroofed altars (Figure 20). The Hellenistic Halls did allow the sacred area to retain contact with the sky, but their height restricted horizon views.[119] The Classical altar of Apollo Delphinios, placed in the centre of this open space, has the same size and orientation as its Archaic predecessor and deviates 2° from the axis of the later Halls framing it,[120] which follow the city's Hippodamian grid system. This means that the Classical phase of the altar was constructed prior to any other structure, in 479/8 BCE, and was not changed when the Halls were constructed. In the early Classical period, the altar was approached from the west with the sacrifices to Apollo Delphinios being offered facing the east.[121] The structure is oriented at azimuth 111° and declination −16°, while the altar has an azimuth of 109° and declination −14°. The orientations are within 10° of the god's temples in Delos and Klaros, but distant from Delphinus' declination. The festival timing of Apollo Delphinios in Miletos as it is known from the end of the fourth century BCE also does not seem to be related to the constellation's movement, since it was held three months after Delphinus' heliacal rising and setting and two months before its acronychal rising (Table 4.5).

Egyptian and Delphic influences have been argued for the construction of Apollo's temple in Didyma,[122] but the foundation myth and consultation procedure bear clear links with Delphi and Delos.[123] The Didymaean temple has also a very similar orientation to that of the temple of Apollo in Delphi, but the horizon in Didyma is much lower. Despite the similarities in orientation between Miletos, Didyma, and Delphi, the festivals in Didyma and Miletos are not linked to the movement of Delphinus. Instead, they may have been governed by the beginning of the year, determined by the spring equinox (at least from the end of the fourth century BCE). These festivities were then linked with the renewal of the calendar and the civic and calendric aspects of Apollo, known to have been prominent, particularly in Miletos. However, the orientation of the Milesian Delphinion is towards the sun's rising and setting position on 12–18 February. This date falls at the end of the Milesian month Lenaion (Attic Gamelion and Delphic Amalios) and the beginning of the Attic



20. The Classical Delphinion in Miletos (adapted after Herda 2011 by Socratis Tsacos)

and Milesian month Anthesterion (Delphic Bysios), a time which marks Apollo's return from the Hyperboreans in Delphi, but which cannot be linked to any calendric or ritual activities performed at the Delphinion. *Parapegmata* recovered at the Delphinion record the position of the sun in relation to the zodiac and the solstices,[124] asserting that its movement was monitored and observed from this location. This evidence, combined with the decoration of the Delphinion's walls with the late Archaic sacrificial calendar of Miletos,

TABLE 4.5. *Religious events of Apollo in Delphi, Attica, Delos, Miletos, and Didyma in relation to the movement of Delphinus and the solstices and equinoxes*[a]

Attic months	Delphic months	Delian months	Milesian months	Relevant festivals	Movement of Delphinus	Gregorian months
(1) Hekatombaion	(1) Apellaios	Hekatombaion	Panemos		**Cosmical setting** (10–11 Aug.)	July–August
Metageitnion	Boukatios	Metageitnion	Metageitnion	Pythia, Delphi (7th)		August–September
Boedromion	Boathoös	Bouphonion	Boedromion	*Beginning of Pythaistai watch (23rd–25th)*		September–October **autumn equinox**
Pyanepsion	Heraios	Apatourion	Kyanopsion			October–November
Maimakterion	Daidaphorios	Aresion ***Apollo absent***	Apatourion			November–December
Poseideon	Poitropios	Posideon ***Apollo absent***	Posideon	*End of Pythaistai watch (end of month)*	**Helical setting** (30–31 Dec.) **Helical rising** (2–3 Jan.) *Delphi invisibility period: 4–30 Jan.* ***Helical rising in Delphi*** *(27–29 Jan.)*	December–January **winter solstice**
Gamelion	Amalios	(1) Lenaion ***Apollo absent***	Lenaion	Sacrifices to Apollo Delphinios, Lykeios, etc., Erchia (7–8th) Cities start preparing choruses to depart for Delia		January–February
Anthesterion	Bysios	Hieros	Anthesterion	Delphic oracle operation (7th) Apollo's birthday, Delphi (7th) *Theôria* depart Athens for Delos beginning of month *Delia/Apollonia, Delos?*		February–March

(continued)

TABLE 4.5. *(continued)*

Attic months	Delphic months	Delian months	Milesian months	Relevant festivals	Movement of Delphinus	Gregorian months
Elaphebolion	Theoxenios	Galaxion	Artemision			March–April **spring equinox**
Mounychion	Edyspoitropios	Artemision	(1) Taureon	Delphinia, Athens (6th) Miletos new year festival (7–10th) Miletos to Didyma procession (11th)		April–May
Thargelion	Herakleios	Thargelion	Thargelion	Sacrifice to Apollo, Erchia (4th) Thargelia, Athens (7th) Apollo's birthday, Delos (7th) Daphnephoria, Delphi, and Thebes	**Acronychal rising** (2–3 June)	May–June
Skirophorion	Ilaios	Panimos	Kalamaion	Daphnephoria, Delphi Septeria, Delphi	***Acronychal rising in Delphi*** *(22–23 June)*	June–July **summer solstice**

Note: [a] On the timing of the Milesian months see Gorman 2001: 38 and n.55; Samuel 1972: 114–18.

confirms the structure's role in the city's religious timekeeping and calendar.[125] The association of the Delphinion with the sun and light is further strengthened through the solar aspects of Apollo, but also through Hekate's worship in the Delphinion, where she was addressed as Phosphoros and Hypolampteira.[126] The present state of evidence does not allow us to conclude with certainty that a solar effect formed part of the deliberate staging of cult experience, which in this case would have been challenging to achieve since the structure was hypaethral, but the sustained orientation of the altar, despite its deviation from the grid of the surrounding Halls and city, is indicative of its importance. The calendric function of the temple and the equinoctial beginning of the Milesian year indicate the presence of a cult closely associated with the sun. This timing, coinciding with the opening of the sailing season in the earlier periods, may have also served the colonial aspects of Apollo Delphinios, commemorated in the foundation myths of both Miletos and Didyma.

The Didymaean sanctuary was an important cult site. Aside from being the place where the annual new year procession from Miletos ended, the sanctuary was also the home of one of Apollo's most important oracular sites in ancient Greece. Epigraphic evidence confirms the oracle's operation in the sixth century BCE.[127] The extant Hellenistic temple's architecture is unique: it is an immense structure which makes a strong visual-spatial mark of the presence of the god in the landscape, but it is, in fact, hollow. Clearly, the temple's size indicates a deliberate effort to be seen from as far away as possible. Its predecessor, the Archaic structure, was a modest *prostyle* temple with an altar formed from the ashes of sacrificed victims.[128] The altar and sacred spring were located in front of the temple's entrance, with the temple's floor at ground level. Around 600 BCE, the Archaic structure seems to have been extended, and the *temenos* and temple were further extended again around 550 BCE.[129]

The *prodomos* of the Hellenistic temple did not lead to the temple's *sekos* and the visitor did not enter the temple through the main entrance. Instead, the architects came up with an ingenious solution which allowed them to avoid raising the Archaic floor, and thus maintain the ancient spring, grove, and Archaic temple without altering their position. At the same time, they created an imposing approach with an enormous visual and psychological impact. Two long and narrow vaulted, sloping tunnels or passages were constructed, each over 21 m long and just over 1 m wide, that led laterally from either side of the *dodekastylos pronaos* down to the grassy floor of the *adyton*. Wiebke Friese traces the first construction of these lateral passages to the 550s architectural phase.[130] The *chresmographion* staircases, which stood on each side of the antechamber, are reportedly 'named as "labyrinth" in a number of inscriptions'.[131] The clever Hellenistic 'hollow' design allowed the Milesians to build a traditional-looking temple that rivalled the Artemision in Ephesus. It played with perception on the exterior, while also allowing direct contact with the

sky. It maintained the natural spring amidst trees that had long been considered the sacred source of the oracle's power, along with retaining the ancient structure, while being completely cut off from the outside world thanks to walls rising as high as 22 m or more.[132] The open-air interior of the Hellenistic temple achieved more than just contact with the sky. It became a space which was alive, ever-changing through its contact with the elements and natural light, creating reflections and shadows during the course of the day and the seasons as the sun moved around it. For the consulters waiting in the *pronaos*, outside the temple for their oracle to be pronounced, a similar light-shadow effect marked their experience and senses,[133] very much in the same way as the Extended Mind Theory argues that external factors supplement internally defined experiences and cognitive processes. The internal cognitive processes of the consultation during the anticipated contact with the god were supplemented by external factors and surroundings. Brain, body, and cosmic structure were connected at a sanctuary which, despite never being finished,[134] operated for centuries.

We lack any information on when the oracle at Didyma operated, or days on which it could not be consulted, and we only have some little information on the mode of consultation. Based on the fasting of three days required for the priestess as preparation for an oracular session, Joseph Fontenrose concluded that the oracle could not have been active more than once in seven days, unless one fasting session enabled her to prophesy for several consecutive days.[135]

Similarly, we are unsure about the consultation procedure. Perhaps no consultant ever went beyond the *pronaos*. Instead, they may have waited outside the *pronaos* while the prophet and other officials went down one of the vaulted corridors leading from the *pronaos* to the *adyton* in order to meet the prophetess, who sat in the vast, open, interior space beside the sacred spring. Once the consultation was complete, the prophet mounted the steps from the *adyton* to the east chamber.[136] The three doors on the west side of the chamber were opened, allowing the consultants limited views of the upper rear *adyton* wall. The sudden appearance of the prophet at the doors, with the empty space behind him, may have resembled an epiphany. From there, the prophet crossed the chamber to the east portal, where he pronounced the consultation to the consultants assembled below him. This reconstruction, however, would mean that only the god's servants were able to see the Kanachos Apollo inside the *naiskos* door and the interior of the temple, along with the vaulted passages. Conversely, it is possible that the consultants went down the vaulted passage themselves,[137] but with no surviving account to inform us of the location at which the enquirer waited for the oracle, it is impossible to conclude with certainty.[138] If the consultant did reach the temple's interior through the vaulted corridors, we can presume some sensory

similarities between this consultation experience and those of Apollo's oracle at Klaros, which we will investigate subsequently. The Didymaean vaulted corridors could not admit two people at once; they were only wide enough for one person at a time. This restricted space is in direct contrast with the enormous size of the temple and clearly plays with the human perception of space. This cannot but have been deliberate, and it would have been completely missed by visitors if they were not allowed to pass beyond the *pronaos*. Instead, if they moved through the temple, the worshippers would have encountered an unusual god-sized threshold, subsequently been forced through the claustrophobic vaulted passages, and possibly climbed a large staircase leading to an upper level of the temple, before arriving at the temple's ancient core: a sacred open-air grove embellished with a small *prostyle* temple.

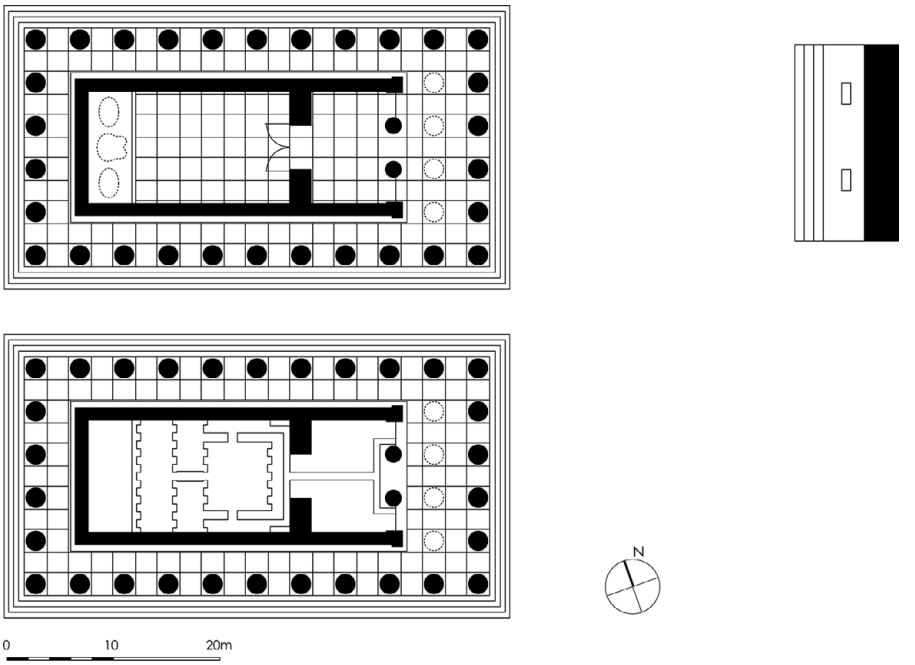
The monumental entranceway by means of an impressive stairway, structuring experience and movement, is familiar from other important Greek sanctuaries of similar date, such as the Acropolis of Lindos and the Asklepieion in Kos (third and second centuries BCE). A common feature in these three sites is an imposing staircase unfolding before the visitors which manages to restrict views of the cult's nexus. The effect achieved is threefold: in slowing down movement along the staircase, which inevitably impedes one's pace, it allows the visitor to appreciate the immediate surroundings rather than focus further afield on an imposing temple. Second, this structures the visitor's experience according to the wishes of the architect, as it creates anticipation and curiosity about the sights that follow (i.e., the temple). Third, it shelters the cult's core by creating 'screens' in the form of obstacles to vision. We have moved beyond the simple *temenos* wall and *propylaia* of the earlier periods to an exciting theatricality. Experience is no longer shaped only by rituals. Architecture is employed in the service of theatrics and staging in order to reveal the sanctuary to the visitor in clearly defined stages.

Klaros

The other important oracle of Apollo in Asia Minor, Klaros, was located approximately 100 km along the coastline to the north of Didyma. Apollo shared the sanctuary with his sister, Artemis, who received temples and altars next to his. The earliest reference to the cult of Apollo in Klaros is in the *Homeric Hymns*,[139] but the most ancient excavated oracle of Apollo in Klaros dates to the time of Alexander, despite indications of an earlier structure dating to the seventh century BCE.[140] The excavated, mid-seventh-century-BCE circular altar predated the temple of Apollo, and in the absence of any recorded architectural remains from this period, indicates open-air ritual activity.[141] The early archaeological remains coincide with the earliest literary evidence of the god's cult at Klaros and date close to the time of the earliest traces of his

Didymaean sanctuary, but credible oracular activity does not seem to commence before the beginning of the temple's construction.[142] The cave mentioned in the ancient sources as the location of the oracle, was, in fact, an underground structure later incorporated below the temple's floor. This underground crypt was the seat of the oracle, where utterances were made after drinking from the sacred well, always during the night.[143] The construction of Apollo's extant temple started at the end of the fourth century BCE,[144] with work resuming in the second century CE, when the temple was finally completed.[145]

The extant temple was of Doric order, a seemingly unusual choice given the temple's date. This choice is interpreted as a deliberate attempt to assign antiquity to the structure, and as perhaps bearing direct reference to Apollo's other major oracular temple in Delphi.[146] A unique architectural feature of the Hellenistic temple is the bronze *astragals* placed in the temple's *crepis*. The Klarian temple was constructed on two levels: the ground floor, using the plan of a standard *peripteral* temple with a *pronaos* separated from the *sekos*, and an underground level. The oracular consultation took place exclusively in the underground space, the crypt, made up of two rooms and a courtyard. Excavators have restored access points in the form of six steps leading underground to the crypt and corridors, which would have been located either in the temple's *pteron* or *pronaos*.[147] The crypt was added to the temple programme in the Hellenistic period and was completed in the second century BCE.[148] It occupied the space below the temple's *sekos* and comprised two rooms: the room accessed first, the Hall of the Consultants, probably used as a waiting room for oracle seekers, and the Hall of the Oracle, thought to have been the room where the god's mouthpiece pronounced the prophecies (Figures 21 and 22). Recent restorations place the ground floor access to the crypt in the temple's front gallery, making this access independent of the temple's *pronaos* and *sekos*. This means that during nocturnal consultations, oracle seekers with the right to enter the crypt did so without requiring access to the *sekos*.[149] From the front gallery, two symmetrical staircases led to corridors dressed in black marble. The extremely narrow width of these corridors, even narrower than the two vaulted corridors of the Didymaean temple, could not fit two people across. This leads to the conclusion that one corridor was used for entering the crypt and the other for exiting. This set-up is followed also in the first room of the crypt, which had two doors, one would have been used to enter and the other to exit the space.[150] As in Didyma, the architecture of the narrow, black marble corridors was clearly aimed at enhancing a sense of mysticism and emotional intensity. The corridors had a labyrinthine layout, requiring the visitor to change direction seven times before arriving at the Hall of the Consultants. This solitary process and experience would have had a deliberate cognitive impact on the consulters, who



21. Klaros ground plan showing temple and crypt levels (adapted after Moretti *et al.* 2014 and Moretti and Laroche 2010 by Lloyd Bosworth)

22. Architectural remains of the crypt under the temple of Klarian Apollo (photo by E. Boutsikas)

experienced not only an underground descent and disorientation, but also sensory deprivation, affecting their state of mind.

The crypt's architecture features numerous characteristics that render it cavelike. As there was no natural way of illuminating the crypt, consultation, which took place at night, was carried out under the light of torches or lamps. Similarly, there seems to have been no natural way of ventilating the crypt.[151] The two symmetrical doors on the south and north walls which gave access to the room did not follow the room's axis. Five marble blocks were positioned in the space between the bows of the arches facing west and functioned as seats.[152] The L-shaped indentations carved in the marble of the arches have been interpreted as mortises for fixing wooden pegs, which, in turn, supported some sort of covering made by arched wooden panels or fabric to form a type of level roller vault. The excavators believe these to have been used to influence the consultants' sensory experience, by giving the impression of being inside a cave[153] – such locations were linked to oracular rituals in ancient Greece.[154] At Klaros, it seems that techniques which mentally transported the oracle seeker to a cave environment were essential in creating the appropriate setting for communication with the god. This cognitive staging may have also been used as 'a metaphor of the celestial vault'.[155] In this way, the cognitive ecology of the oracle seeker's visit involved an experience of the cosmos, facilitated by architecture, that fulfilled the spiritual purpose of the visit.

Ancient sources on the oracular consultation procedures are terribly late, so it must be assumed that the procedure remained unchanged for centuries. The retention of architectural features central to the consultation through the successive building phases supports this assertion. The source of the oracle's inspiration was the water of a well located inside the Hellenistic temple's crypt. The well had been in the same location since the Archaic temple (mid-sixth century BCE),[156] which also contained a hypaethral courtyard, integrated later into the Hellenistic temple's crypt.[157] The incorporation of the Archaic remains in the underground level of the Hellenistic structure retained their orientation and location, despite the shifted orientation of the Hellenistic temple a few degrees to the north.[158] The well was important in the consultation procedure. We are informed that on certain nights, after a number of preliminary rituals, the prophet drank water from the well and then prophesied without being visible to the oracle seekers.[159] The temple's courtyard, which sinks 3 m below the temple's paving and contained the well, was only accessible to the *thespiode* (chief priest), the prophet, and the temple's staff.[160]

The Klarian temple bears many similarities to Apollo's temple in Didyma: the incorporation of a hypaethral courtyard or grove in the temple's plan, the double narrow, dark corridors or passages, the inaccessible consultation room, the well, etc. It seems that the similarities between the two oracles extended also to the rituals. It has been argued that the god's mouthpieces in both sites

had received the same education.[161] The Klarian oracle also has references to the Delphic: the presence of the spring, the *omphalos*, the consultation room, and the layout of the temple.[162] Furthermore, at Delphi, Dionysos' tomb was located inside Apollo's temple, while at Klaros, Apollo shared his altar with Dionysos.[163]

The architecture of the Klarian temple and our sparse knowledge of when in the year consultation took place does not allow an interpretation which could fully integrate the temple into the rotating cosmos. But the temple and altar's equinoctial orientation, combined with the sundials recovered in the sanctuary, indicate (as in Miletos) that the movement of the sun was being monitored at the site, even if it was not imbedded in ritual experience. These observations would not have influenced the oracular consultation, since it took place at night and underground, at least from the Hellenistic period. The process may have not been exactly the same in the Archaic period, when the well and courtyard were open to the air, but we are in no position to argue for an astronomical significance with the current evidence. As at Didyma, though, ritual experience was here much influenced by architecture and aimed at inducing an emotional and psychological state that was appropriate for contact with the god. At Klaros, too, ritual experience was influenced by the use of light, or rather, its absence. The low height of the crypt's domed ceiling would have given oracle seekers at Klaros the impression of entering a cave.

Recent cognitive science research on crucial factors determining human perception of dark spaces has much to offer to our understanding of this experience. The 'predictive processing' model informs us about the workings of the human brain in light-deprived and low sensory conditions. These conditions are common in ancient Greek religious experience. A recent experiment using a virtual reality model asked participants to detect beings inhabiting a virtual forest, when, in reality, no beings were present. The experiment's aim was to monitor reactions of agents as a proxy for real-life religious experience of the existence of supernatural beings. The participants were exposed to the same forest in daylight and in dense mist (instead of darkness, which can cause fear); half of the participants were told they had a 95 per cent chance of encountering 'beings', and the other half were told they only had a 5 per cent chance. The results demonstrate that in such conditions, and when the agent expects it, the human brain commonly imagines encounters with the supernatural, 'especially in contexts of low sensory reliability', even when there is no actual presence.[164] This false detection has been interpreted as giving rise to or strengthening religious beliefs.[165] Predictive processing suggests that the reverse reaction may also be possible, whereby religious teachings create expectations of divine presence, which cause false detection in agents. This is confirmed by the experiment, which reports that

participants anticipating a high probability of encountering beings in the forest have more such (false) encounters than those expecting a low probability.[166]

Ancient accounts of experience at the oracle of Trophonios attest to the mind's ability to create visions and images in completely dark conditions.[167] The vaulted crypt of the Klarian temple may have been remodelled in later periods, but the intention to inspire contact with the divine and intensify ritual experience was sustained. Intense darkness certainly assisted in this, and the modern experiment attests to the power of contact with the divine combined with low sensory conditions. In both Didyma and Klaros, from the moment the oracle seeker commenced his descent through the windings of the narrow, labyrinthine passages, his senses engaged intensively as he entered the liminality of these dark spaces, preparing his transition into another state of mind. This change of consciousness was a precondition for contact with the divine. This experience would have been more profound at Klaros because of the intensified darkness and the cognitive environment of being in an 'underworld' space. It is clear that the construction of space at both oracle sites considered the presence of a labyrinth important and underground structures (or caves) as fundamental to divine consultation.[168] The intention was a sensory experience, cognitively linking oracular consultation with underground, light-deprived experiences. We explored in Chapter 2 the way in which the body-brain-mind engages with its surroundings using orientations, lines of sight, and spatial movement in order to construct an understanding and interpretation of the cosmic structure and our place within it. The consultation procedures and structures described here provide us with physical evidence that the ancient Greeks were not only aware of these cognitive processes, but could furthermore use them with great success.

Bassae

In recent years, archaeologists have started to use virtual reality as a tool to assist us in better understanding the cognitive processes involved in religious experience. The temple of Epikourios Apollo in Bassae is one of the most appropriate structures for such an investigation. It was covered with a canopy in 1980 for protection against extreme weather conditions, which had been causing its rapid deterioration, and to facilitate restoration. Since then, it has not been possible to study the structure within its environment. At the same time, this is perhaps the only ancient Greek temple whose positioning has received so much attention, resulting from suspicions of solar links related to its orientation. In addition to the presence of the protective canopy, the preservation of the extant Classical temple of Apollo does not allow us to experience the illuminating effect of the rising sun in the temple's interior, which has long been suspected to have been the intention behind its orientation and its east

side entrance. The temple is customarily mentioned as an example of an unusual orientation (its main entrance is oriented almost due north), which breaks the 'normal' eastern orientation pattern of Greek temples. As Madeleine Jost has shown, it is an exaggeration of scholarship to place so much emphasis on the temple's 'unusual' northern orientation. She has successfully deconstructed the 'mystery' behind the so-called uniqueness of this temple, demystifying its orientation and its particularly elongated plan by demonstrating that neither aspect is so unusual for Arkadia. Other Arkadian temples have a similar northern orientation and they have not received a fraction of the attention for their 'peculiar' orientation (e.g., temples on Mt Kotilion and Mt Boreion and the temple of Alipheira).[169] The temples of Alipheira and Tegea, in particular, contain all three elements which scholars have called peculiar in the temple of Bassae: the northern orientation (Alipheira), the presence of a side entrance (Tegea), and a particularly long plan (both). For Jost, Bassae is a simple case of local tradition and preference, paired with a very talented architect, rather than a choice of symbolic significance. Agreed.

But the temple has attracted attention also because of the implications of the positioning of its eastern doorway and the illuminating effect this would have caused when the rays of the rising sun entered the temple's *adyton* and perhaps reached the cult statue. The side entrance of Alea's temple in Tegea, as we saw in Chapter 2, faces north and is positioned at the mid-length of the *sekos* wall. At Bassae, the written sources mention the presence of a bronze statue of Apollo, which in later times was moved to the Agora of Megalopolis.[170] It has been argued that, if it had been placed in the *adyton*, the statue and the rising sun would have created a spectacular effect.[171] Quite possibly, but in order for this effect to be appreciated, the feast day had to take place around midsummer. And if we follow Frederick Cooper's argument about the deliberately orchestrated admission of a small sliver of sunbeam into the *adyton* as the result of only the narrower door valve (the north) being open (to the interior, with the door's south valve permanently fixed shut by a single backing block),[172] then the temporal window for observing this effect becomes even narrower. And there is also the idea that the bronze Apollo statue must not be considered as the cult statue.[173] Given the several Apollo festivities celebrated close to this time in the year throughout Greece (e.g., in Athens, Delphi, and Delos), a festival around this time of year does not seem far-fetched, but the precise time of the festival to Apollo in Bassae cannot be fixed with any degree of certainty. We have simply no idea when it took place. Since 1980, it has not been possible to obtain photographs or actual observations relating to the light effects or landscape. In addition, the sun's position has moved since the fifth century BCE. Thus, the use of 3D technology and virtual reality models (VRM) is the only avenue we have for determining, rather than speculating about, the light effect of the sunrise in the temple.

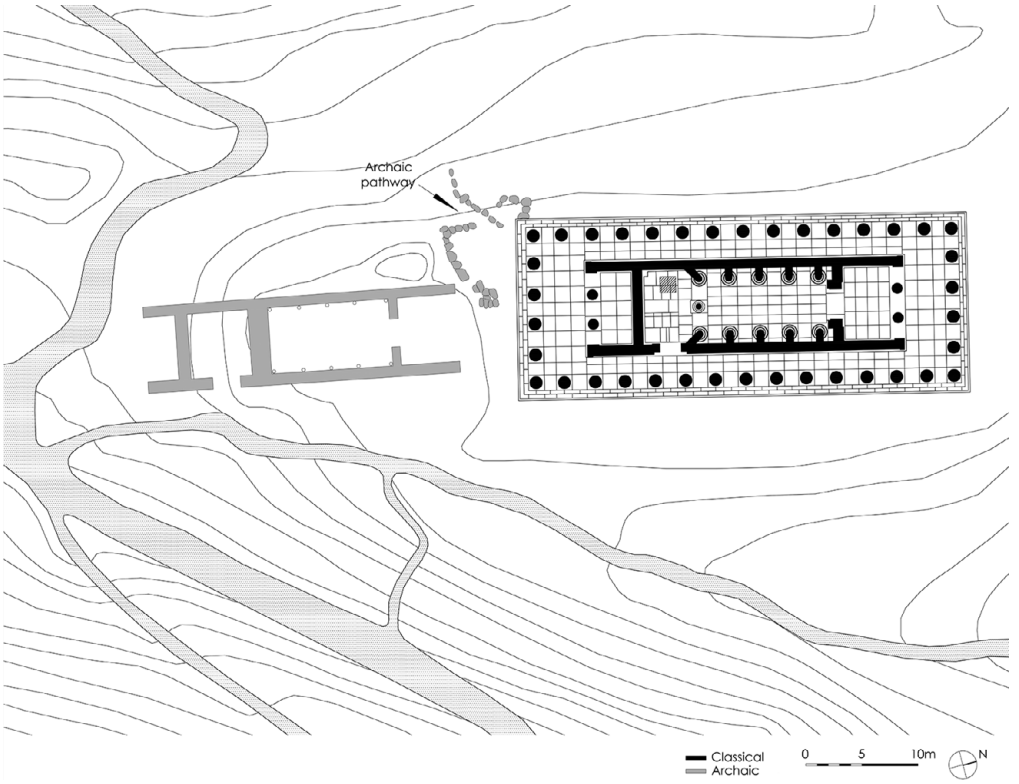
23. Bassae NE–E horizon of Classical temple (photo by E. Boutsikas)

The sanctuary of Epikourios Apollo is situated on a rocky peak of the sacred Arcadian mountains on the southern slope of Mt Kotilion, at 1,130 m elevation and less than 1 km away from ancient Phigaleia, the closest ancient city. As the mountain peak continues to rise on the N–NW, open horizon views are visible towards the NE–S (Figure 23). The temple, despite being situated on a high mountain peak, does not occupy a prominent position in its surrounding landscape. It is invisible from the valley below the temple (Petralona), from where the site of the sanctuary appears as an indentation in the mountain ridge. The only distant location from which the temple can be seen is from Mt Lykaion, on the north-west route leading to the sanctuary from Lykosoura (Figure 24). Upon arrival at the sanctuary, no eastern views are visible because the height of the natural rock ridge places the observer 2.5 m lower than its crest.[174] This limited view remains as the observer moves northward to the Classical temple's main entrance. There, the ridge rises further, completely concealing the eastern horizon, even if the observer stands on the north entrance *stylobate*. The eastern horizon is revealed at the southern end of the external colonnade and the temple's *adyton*. The outcrops of projecting bedrock imbedded as exterior decoration on the Archaic temple's east wall would have limited the north-east view if looking out of the east entrance from inside the temple, but at the same time, a narrow passageway carved in these rocks was discovered, indicating that visitors walked along the temple's eastern exterior.[175]

Archaeologically, it is beyond certain that the orientation of the temple was fixed from as early as the Archaic period. There is continuity at least in architectural design between the Classical temple and its Archaic predecessor

24. The temple of Apollo as seen from Mt Lykaion. For colour version, see the plate section. (Photo by E. Boutsikas)

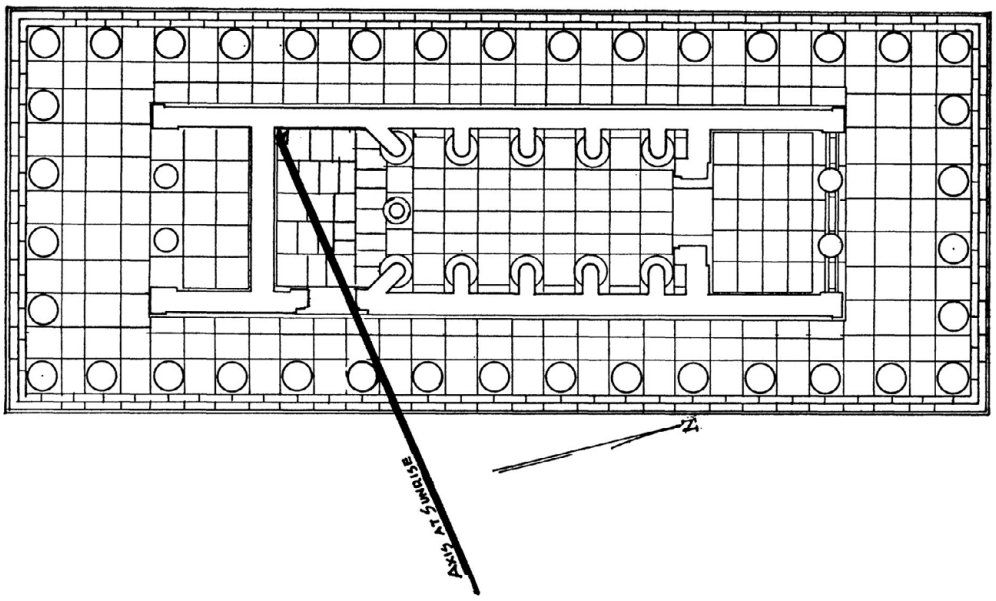
(ca. sixth century BCE), located only 10 m further south (Figure 25). The orientation of the Classical temple was dictated by its Archaic predecessor,[176] although slightly shifted towards the east (Figure 25). The layout and size of the *sekos* and *adyton* is almost identical in both temples. This effort to imitate the plan of the earlier temple is also apparent in the placement of the Classical temple's floor level as close in height to the north end of the Archaic floor level, despite the effort required to cut into the natural rock in order to achieve this. The exact dimensions of the Archaic east doorway are not known, but its placement corresponds to that of the Classical temple. The doorway is estimated to have been narrower than the preserved 2.5 m-wide gap, which was definitely off-centre of the marked *adyton* space (Figure 25).[177] The Archaic *adyton* is also marked by an unusually thick northern foundation wall, which separates it from the *sekos*. This thickness is seen as necessary in order to retain the levelling fill used in the temple's *sekos*, but conclusive evidence as to whether there was a wall dividing the two areas of the Archaic structure is absent.[178] Nancy Kelly concludes that if the northern line of the *stylobate* of the Corinthian and oblique columns was the starting point of the Classical temple's *adyton*, this would provide enough space (given how shallow the Classical *adyton* is otherwise) for an exact correspondence in depth between the Classical and Archaic *adyta*. But the small discrepancy in the sizes of the two *adyta* has been interpreted as enigmatic unless connected to the light effect of the sunrise on the cult statue.[179] The floor levels between the structures are quite different.



25. Ground plans of the Archaic and Classical temples of Apollo in Bassae (adapted after Kelly 1995 by Socratis Tsacos)

The presence of a stairway in the ascending path located at the south-west corner of the Classical temple indicates that the bedrock dropped sharply in that area and also that the Archaic building probably stood on a ridge which required the construction of foundations capable of holding it. The Archaic *adyton* floor level drops by ca. 1.4 m compared to the temple's north end.[180] This resulted in a sunken *adyton* and *opisthodomos* compared to the *sekos* and *pronaos*. This change in floor levels between the *sekos* and the *adyton* is not reflected in the Classical temple, which maintains the same floor level throughout its interior, but differentiates between the spaces through the use of different grid patterns in floor paving (Figure 25).

The most striking of these patterns is that of the Classical *adyton*, the paving of which does not follow a grid. The irregularity in the grid starts from the slabs used under the oblique columns and the Corinthian column, which separate the *sekos* from the *adyton*. Dinsmoor's idea that this pattern is concentric around an object placed on the largest slab of stone found against the centre of the south wall and directly behind the Corinthian column could indeed justify the size of the slab,[181] but this positioning would make the object invisible from any position along the central axis of the *sekos*, as the Corinthian



26. Cooper's reconstruction of the angle of the light beam entering the *adyton* (after Cooper 1968: 104)

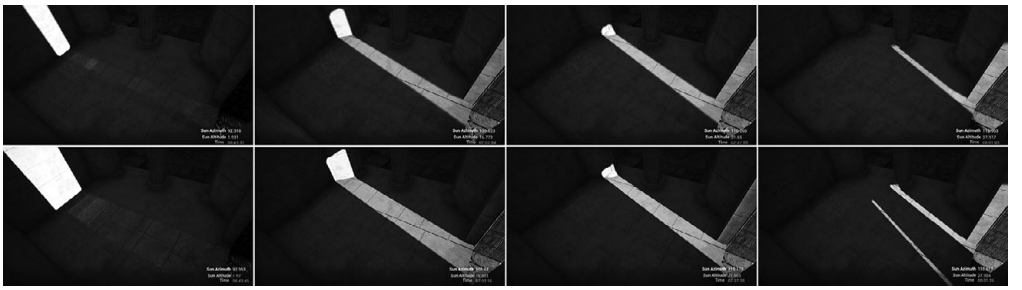
column would stand in the line of sight. The viewer would have to be squeezed against one of the side columns in order to see the object. This strip of stones and the one behind the Corinthian column have been viewed as mimicking the wider width of the Archaic *adyton* wall present in the corresponding area of the Archaic structure.[182] Cooper suggests that the entire focus of the Classical temple's arrangement was centred around the illumination of the south-west corner paving block (Figure 26). He argues further that this block was used as the orientation-setting cornerstone and the cult statue of Apollo was placed on the same axis.[183] One of the reasons leading Cooper to suggest this deliberate illuminating effect stems from identifying a discrepancy outside the east entrance in the positioning of the fifth and sixth exterior columns (from the south), which are placed further apart than the rest of the columns. He measured the sixth column to be positioned further south by 0.028 m and thus concluded that this minor adjustment served the aims of the visual effect created by the sunbeam entering the *adyton*.[184] Although this observation is valid, we lack supporting evidence for the position of the cult statue and, furthermore, this analysis will demonstrate that the south-west corner was not illuminated by the sun when the south door valve was closed.

A survey of the temple's orientation and horizon deduces an equinoctial declination of its eastern doorway (dec. -3°, Table 4.1), which matches Apollo's solar attributes. In addition, we saw previously that this time was also important in the Apolline sanctuaries of Delos, Klaros, and Miletos. The east

entrance of the Bassae temple was oriented to sunrise one week before the spring equinox at the time of the temple's construction and for centuries later. During this time, the rising sun aligned with the temple's side entrance on the equivalent of our 18 March. The change caused by precession resulted in a slight shift in the sun's position by the first century CE, so by this time the sun aligned with the orientation of the entrance on 15 March.

The only way to verify and visually reconstruct the illuminating effect that this rising would have had in the temple's interior is through 3D technology. Orientation, architectural, and landscape data were entered into the virtual reality gaming platform Unreal Engine 4 (UE4), which, although developed for gaming, facilitates photoreal visualisations. Virtual reality technology was preferred over a simple 3D reconstruction in this case, as it allows for human interaction with the three-dimensional visual content and photoreal visualisations of space at different levels of immersivity.[185] A unique benefit of the VRM is that with the appropriate equipment we can virtually experience the temple and the visual impact of the sun's movement in the interior ourselves through an avatar.

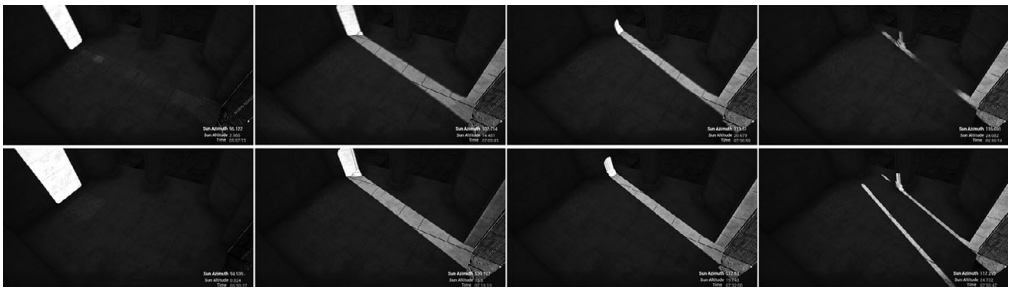
The endeavour was not without difficulties and limitations. The integrated solar data of UE4 was found to be inaccurate, and so the movement of the sun had to be entered manually in order to accurately recreate the landscape, temple, and sunrises.[186] Similarly, there is no available plug-in compatible with UE4 for an accurate reconstruction of the night sky, which is the reason no further such reconstructions have been carried out in this work; but for an investigation of possible solar effects, this platform is ideal. The VRM generates a visually compelling and accurate reconstruction of the moments when the sun would enter the structure in antiquity,[187] but as anticipated, some minor details of the temple had to be estimated.[188] As this endeavour was novel at least for Classical archaeology, conventions had to be established. For example, the side of the model had to be controlled for development time purposes, and the acquisition of detailed landscape data was the most challenging aspect, as no LiDar survey data exist for Bassae. Thus the landscape data used were those available from NASA ASTER,[189] which are of the same resolution as the data of Greek military maps. This means that the best achievable resolution was 30 m per pixel, which, given the UE4 engine's inability to interpolate between the various heights of a quite mountainous landscape, resulted in a landscape distorted by visibly artificial lines, even after being improved through the Geospatial Data Abstraction Library toolset.[190] This difficulty, however, is of no consequence to the present study, as we do not investigate the surrounding landscape. The virtual simulation allows us to both test the hypothesis and experience the solar impact, as well as to visualise the effect of the sun's movement on the temple's natural interior illumination throughout the year.[191] The following analysis exemplifies the value of VRM in archaeological and archaeoastronomical analysis. It demonstrates that immersive virtual reality



27. Virtual reality simulation model of the temple's interior showing the visual effect of sunrise during the equinoxes between 500 and 100 BCE. **Top row:** progression of sunbeam at equinoxes with one door leaf open. **Bottom row:** progression of sunbeam at equinoxes with both door leafs open. For colour version, see the plate section. (Model developed by Ben Price using survey data collected by E. Boutsikas and astronomical data from Starry Night Pro)

technology can offer some understanding of ancient sensory experience and can help immensely in visualising contextual data.

The results reveal that a sunbeam entered the temple's side entrance at the spring equinox about forty minutes after sunrise (Figure 27 top row).[192] It traced a path across the temple's *adyton* for three hours, approximately 5.30–8.30 a.m. Upon entering the temple's interior, the sunbeam appeared in the centre of the marble slab marked on the floor, moved along the west *adyton* wall and floor, and eventually illuminated first the base of the west oblique Ionic column, and then slightly the base of the Corinthian column, which it almost missed before withdrawing. If this was the location where the cult statue stood, it would have created an interesting effect. This simulation follows Cooper's argument about the permanently shut position of the south door leaf.[193] If both door leafs were left open, the effect would have been very similar, but in this case the sunbeam was thicker and would illuminate the entire width of the slab upon entering the temple (Figure 27 bottom row). As observed in the figures, the illumination of the Corinthian column is only visible from inside the *adyton* or if one stands directly outside the side entrance. From the interior of the *sekos*, or the temple's main (north) entrance, the sunbeam was visible, but its movement would not have been particularly noticeable and the illumination of the west wall would have been hidden behind the oblique south-west column. At sunrise, a week before the spring equinox, when the sun was aligned with the east entrance, the sunbeam entered the structure at a different angle (Figure 28). It illuminated the north end of the marble slab, the entire lower half (back and front) of the west oblique Ionic column, and slightly more of the Corinthian column. The discrepancy of a week before the equinoxes could be explained by the various concepts which can be identified as 'equinox'. As discussed elsewhere, the concept of the equinox is far from straightforward and could in fact mark three

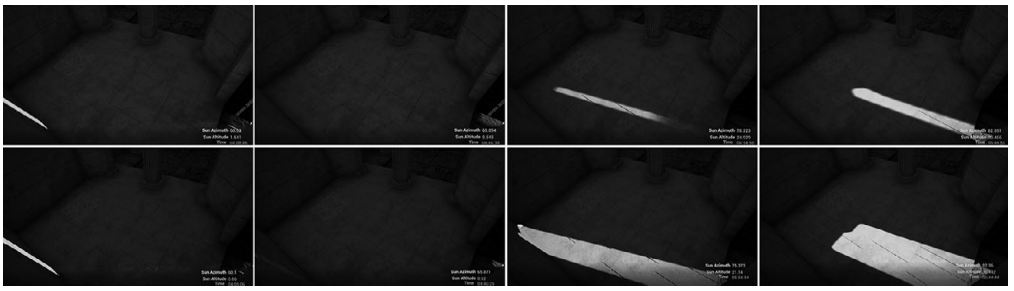


28. Virtual reality simulation model of the temple's interior showing the progression of the sunbeam a week before the equinoxes, when the sun was aligned with the east entrance, between 500 and 100 BCE. **Top row:** progression of sunbeam at equinoxes with one door leaf open. **Bottom row:** progression of sunbeam at equinoxes with both door leafs open. For colour version, see the plate section. (Model developed by Ben Price using survey data collected by E. Boutsikas and astronomical data from Starry Night Pro)

different occasions or as many as four[194] (the time in the year that day and night are of equal length, the mid-point of the rising sun in the horizon between the two solstices, etc.). For the ancient Greeks, the equinox was understood as the equal length of day and night and carried important cosmological significance.[195] On both dates, the slab marked on the ground plans and also the west part of the *adyton* in general, which according to one interpretation was where the cult statue was placed, were only marginally illuminated by direct sunlight. However, the reflective properties of bronze would have intensified the luminance, and the duration of the effect would have seemed longer. Given the almost precise correspondence between the Classical and Archaic eastern doorways and *adyta*, a similar effect was also visible in the earlier temple.

The VRM enables us to examine the movement of the sun from a number of points in relation to the temple. One such example is the simulation of sunrise at the equinoxes as seen from outside the temple's main entrance. If we look towards the east at the moments when the disc of the sun rose above the horizon on the equinox in antiquity, we observe that it rose behind the second north-east external column and became visible after it had risen above the horizon (Figure 29 top row). A week earlier, when the sun's declination was the same as the orientation of the east entrance, the sun's disc became visible as soon as it started to rise above the horizon, adjacent to the southern edge of the same column (Figure 29 bottom row). Current knowledge of the Arkadian calendar and the absence of any indication of the timing of Apollo's festival in Bassae do not allow us to further investigate whether this occurrence functioned as an equinoctial marker, or indeed to determine the intentionality of this effect. Similarly, the path and duration of the sunbeam in the temple's interior changes during the year and it is not possible to be more conclusive in the absence of further contextual material. For the sake of comparison, we can investigate the summer solstice, the other calendrically important solar date.

29. Virtual reality simulation model of the temple's exterior between 500 and 100 BCE. **Top row:** progression of sunbeam at equinoxes. **Bottom row:** progression of sunbeam a week before the equinoxes. For colour version, see the plate section. (Model developed by Ben Price using survey data collected by E. Boutsikas and astronomical data from Starry Night Pro)



30. Virtual reality simulation model of the temple's interior showing the visual effect of sunrise during the summer solstice between 500 and 100 BCE. **Top row:** progression of sunbeam with one door leaf open. **Bottom row:** progression of sunbeam with both door leafs open. For colour version, see the plate section. (Model developed by Ben Price using survey data collected by E. Boutsikas and astronomical data from Starry Night Pro)

The VRM shows that on that date, the sun briefly entered the *adyton* at 4.00 a.m. and traced a path along the temple's south (back) wall, moving towards the south-west corner. It withdrew completely from the temple's interior forty-five minutes later, before reaching the south-west corner. Just over an hour later, at 6.10 a.m., it re-entered the *adyton*, illuminating the centre of its floor for a few minutes, until it withdrew completely approximately an hour later. This effect was caused by the temple's *pteron* column, which blocked the sun from shining inside the temple for a few minutes, until the sun moved between the two exterior columns flanking the east entrance. If both door leafs were left open during the summer solstice, the sunbeam would have had time to reach the very bottom of the south-west temple corner before withdrawing (Figure 30).

We observed that the light beam shining on the west wall was invisible if the observer stood in the *sekos*. The corner slab of the *adyton*'s south-west corner may have been slightly raised,[196] but whether this construction supported the

cult statue cannot be said with certainty. The VRM confirms Cooper's suggestion that the east doorway allowed a very thin and specific beam of light to enter the *adyton*, but not in the position he estimated. The VRM has enabled these observations as visible in antiquity, not only due to the sun's movement, but also because of the temple's weathering: the use of a layer of clay and sand between the temple's foundations and the bedrock at the time of its construction has indeed protected the structure from seismic activity as intended by its builders, but has also caused considerable movement of the structure above ground. This movement has caused the columns to tilt.[197] The tilting effect is evident in the columns outside the eastern doorway, which Cooper measured to tilt 0.07° to the south and 0.80° to the west.[198] This shift would produce a different light effect to the one observed in antiquity. Although the Corinthian column and the south-west corner were not washed in light, the shadow effect created by a strong light well in the confined space behind the column would have been impressive. The architecture of the temple's interior colonnade confirms the intention of manipulating a light-shadow effect at Bassae. The pair of southernmost interior columns (those standing on either side of the central Corinthian column) are positioned at an oblique angle, not at right angles to the wall like the rest of the columns (Figure 25). This must have been intended to optimise the amount of light entering the temple's *sekos*. When the light from the east entrance entered the *adyton*, this construction would have operated as a funnel, directing the light into the centre of the *sekos* and washing the temple's interior with light. Had these two columns been positioned at right angles to the walls, the effect would not have been as impressive, as the columns would have obstructed the reflecting light and allowed only a smaller beam of light to enter the *sekos*.

The observed effects which may have linked Apollo's cult at Bassae with the sun could find further support in the temple's sculptural decoration: one of the north porch metopes (metope P4) depicts Apollo holding a lyre met by a male figure pouring a libation.[199] This has been interpreted as evidence of Apollo at Bassae being related to Apollo Kitharoidos (Apollo holding a lyre) and Apollo Lykeios, who also carries a lyre.[200] The conclusion is supported by the discovery of a tortoiseshell lyre,[201] ca. 10 m north of the temple's north-west corner. Of more interest in this depiction is Apollo's attire, which has been identified as characteristic of that of northerners, and has led to the conclusion of a depiction of Apollo having returned from the Hyperboreans. The entire scene, comprised of six metopes, seems to depict the moment of the god's return from the land of the far north,[202] a scene which finds parallels in the description of his return in the *Homeric Hymn to Apollo*. As the temple faces north, the metopes depicting the scene of Apollo's return mark the direction from where the god would have arrived.[203] The idea of deliberately positioning the temple's architectural elements to the direction of relevant topography,

finds support also in the southern metopes (above the temple's opisthodomos), which depict the rape of the Leukippidai, marking also the direction to the south towards the Neda Valley, the area where this event was believed to have occurred.[204]

TIMEKEEPING AND EXPERIENCE OF APOLLINE CULTS: A SUMMARY

Apollo's metamorphosis in the *Homeric Hymn*, first to a dolphin and then to a star, may not be circumstantial. In the case of Delphi, it appears that the association of Apollo with the dolphin manifests through linking the oracle's operation with the movement of the constellation of Delphinus. Apollo goes to the north at the same time as Delphinus is only seen to set in the north-west. During the final month of Apollo's stay in the land beyond the north wind, Delphinus is not visible at all, until the god and the constellation return at Delphinus' heliacal rising. The proposed narrative blends time, landscape, and memory. Delphi's topography is unique, but so was Delphi in the minds of the ancient Greeks: a cosmic place. Myth entered present time once a year in Delphi, at the moment when the cosmos and divinity perfectly converged. A similar story may have been also present in Dreros and Gortyn given the temple's orientation, but since the timing of the festival of Apollo here has not survived, it is not possible to be conclusive.

In Delphi, Apollo's birthday, his return from the land of the Hyperboreans, the festival of the Pythia, the timing of the Delphic oracle, and perhaps the Daphnephoria and Septeria all occurred in conjunction with the constellation's four major astronomical events as seen from the Delphic landscape. These observations were also recorded in *parapegmata*. In Attica, rites in preparation for the departure to the Delphic oracle for the annual consultation, such as the end of the Pythaistai watch in Athens and the sacrifices offered to Apollo Delphinios in Erchia prior to the procession's departure, were also timed to coincide with Delphinus' major events, which became visible from those landscapes approximately three weeks earlier than in Delphi.

Although the landscape and position of the Delian sanctuary at sea level contrasts with the mountainous horizons of Dreros and Delphi, the general orientation of the Delian Apollo temples is towards Delphinus' setting point, and the movement of Delphinus seems to have coincided with the commencement of the preparations for the Delian festival. The idea of the constellation's use as a warning marker can also find support in the timing of the choruses' preparation for the Delia. Although a number of the festivals discussed here, such as the Delia and the Daphnephoria, were not celebrated annually, the relevant astronomical observations would always have been visible at the time of these cult rites. Delphinus would have been seen to rise in the horizon in front of the rear entrance of the *Oikos* of the Naxians and the

Keraton altar and to set in front of the entrances of the three temples of Apollo. A further indication of the relationship between the constellation and Apollo can be seen in Apollo's Delian birthday, which overlaps with Delphinus' acronychal rising and the summer solstice. Since the time of the annual departure of the Athenian *theôria* to Delos for the festival is known,[205] the time when the cities would start preparing for the departure of the choruses can be estimated. This coincides with the first month after Delphinus' heliacal rising and heliacal setting. Of the festivals considered here, those which cannot be associated with the movement of Delphinus are the Athenian Delphinia and possibly the Delia/Apollonia. It is perhaps indicative that both of these festivals are strongly associated with the myth of Theseus rather than with Apollo per se.[206] Given the uncertainty about the timing of the Delia, it is difficult to make inferences about possible astronomical links for the timing of the festival. The Athenian Delphinia, though, took place at the same time as the Milesian festival of Apollo Delphinios, in the first month after the spring equinox.

It is not surprising that a constellation as small as Delphinus was observed and recorded in the *parapegmata*. For timekeeping, the advantage of small constellations over larger ones is that they complete their risings and settings within a day or two, while for larger constellations, although much easier to see, it may take as long as a month for their full rising or setting to become visible – a feature which makes them poor time markers unless the viewing focuses on the rising or setting of a particular star in a constellation. We observed that the Pleiades and Hyades are further examples of the usefulness of small constellations in timekeeping. The added advantage of using Delphinus as a marker is that its heliacal rising occurs at the same time as its heliacal setting. Both events take place in the heart of winter, which is the most likely period for bad weather. Being able to observe both phenomena at the same time is advantageous, since it is possible to observe one event in the east and the other in the west within a maximum of five days. The use of a constellation as an additional means of regulating the luni-solar calendar is not an unknown practice. The debt of ancient Greek timekeeping and astronomy to Babylonian astronomy is well established; in the Babylonian calendar, also luni-solar, the time when an intercalary month had to be inserted was determined by observing the rising and setting of stars.[207]

Apollo in Asia Minor had recorded links with Delphi, Delos, and Crete, and the temples in these locations highlight his timekeeping role. Although the orientations of the temples at Didyma and Miletos are not similar, they both seem to have been governed by the same solar observations, had direct contact with the sky, and commenced their year at the spring equinox. The orientation of Didyma is comparable to Delphi and Dreros. Although the Klarian oracle has been compared to those of Didyma and Delphi since antiquity, the orientation of the temple is very different. Instead, it is almost identical to the

declination of the Delian temples, 10°–15° from Delphinus' declination, and towards the position of the sun within a few days of the spring equinox. We saw that the same event also had an effect on the god's temple in Bassae, suggesting an interplay between light and darkness. This polarity is not unfamiliar for the god of light; the cognitive processes discussed in relation to the consultation procedure of Klaros and Didyma help us complete this picture.

In summary, the cults and sanctuaries examined here can be clustered in two groups. First, the equinoxes and, in particular, the spring equinox seem to have been important times in a number of sanctuaries: the orientations of the god's temples in Delos and Klaros and the east entrance of Bassae face towards the sun's position at the equinoxes. Similarly, in Dreros, the month Delphinios probably fell during this time, and Apollo's new year festival and procession from Miletos to Didyma was also celebrated then. The second group involves the solstices paired again with Delphinus. The operation of the Delphic oracle and the Pythaistai seem to have been linked with the movement of Delphinus near the time of the winter solstice. Finally, the Daphnephoria and Septeria were celebrated at the summer solstice (and also during Delphinus' acronychal rising). At the sanctuaries of Delphi, Klaros, Didyma, Miletos, and Bassae, we saw that time was recorded through the use of sundials or *parapegmata*, but it was also possible to do so through the orientation of the temples. Overall, these astronomical occurrences mark the times in the year when the balance between daylight and darkness shifts. This occurrence was of great significance in ancient Greek cosmology, which viewed the equal length of day and night as a form of eschatological balance. Such a division was believed to exist, for example, in the valley of the blessed in the underworld and Pindar's Second Olympian Ode has been argued to have used the 'equinox as the form of the ideal cosmic equality'.[208]

The linking of the discussed sanctuaries with astronomical events for timekeeping purposes forms one aspect of the interweaving of these sites with their total environment. Apollo's cosmological role discussed at the beginning of this chapter complements our understanding of the aims of oracular and non-oracular procedures and their impact on experience. Something of this transpires in Iamblichos' description of the illumination of the Pythia in Delphi, using Neoplatonic images which relate to cosmology. Such is the description of the circular fire enveloping the Pythia from all sides (κύκλῳ πανταχόθεν), which is a common way philosophers of the time refer to the god of fire, or the *aether* which surrounds the celestial spheres.[209] Iamblichos is a terribly late and convoluted source, so any conclusions drawn require caution and it is also possible that this cosmological link is a later addition. However, in both cases, this link must have developed from Apollo's earlier cosmological connotations.

Architectural form transforms experience 'spatially, metaphysically psychologically, emotionally and associatively'.[210] In this chapter, we explored the theatricality and impressive visual effects employed in the oracles. The scale of Apollo's temple in Didyma and the light-shadow effects in his Bassae temple were clearly aimed at creating lasting memories of the divine encounter. More intense psychological manipulation was achieved through labyrinthine passages, underground descents, and darkness in Apolline consultations. Although no oracle of Apollo is securely attested in historic times in Delos, we are informed that the ritually important 'crane dance' performed in front of the temples of Apollo, through its many twists and turns, imitated and commemorated Theseus and Ariadne's windings of the labyrinth in Knossos.[211] The ambiguity of direction when moving through a labyrinth can be perceived as a metaphor for the uncertainty, intimidation, and anticipation of the oracle seeker regarding the god's response.[212] The temples of Didyma and Klaros required the oracle seeker to change levels by stepping down into the bowels of the religious structures. In both temples, the idea of nature was important. We have the presence of groves in both oracles, but also, in Delphi, nature is present through the links with Gaia. This association with nature is perhaps more explicit in the attempt to imitate natural darkness similar to that found in naturally enclosed spaces like caves. These elements were clearly aimed at altering the seeker's frame of mind and perception, affecting cognition through low sensory conditions, and inducing a specific emotional state in order to prepare the oracle seeker for contact with the divine. We see this deliberate interference with the oracle seeker's mind in other, non-Apolline oracles, such as the cave in the oracle of the dead in Heracleia Pontica and the arched passageway of the Ploutonion in Hierapolis, but also in the oracular experience of Trophonios in Lebadeia.[213] The model of 'predictive processing' demonstrates the impact of low sensory conditions in attempted contact with the supernatural. Such conditions forge human understanding of the cosmic structure. Oracular contact with the divine could not occur under ordinary situations even for the god of light.

FIVE

THE COSMOS IN MANIFESTATIONS OF IDENTITY, MEMORY, AND REMEMBRANCE

In this chapter we discuss festivals conventionally categorised as polis cults and initiation rituals, with the intention to investigate how time, memory, the re-enactment of myths and performances, and the integration of a seemingly participating cosmos become active ingredients within religious space. Since ritual performance translates to ritual and performative memory, a study combining temporal conditions, ritual narratives, and space has the potential to enhance understanding of how the human body responds to stimulants responsible for structuring experience and constructing context-specific memories, be they architectural, performative, or temporal.

Local myths, memory, identity, and ritual performance combined with time and place, all ingredients of polis cults and rites of passage, structured ancient understanding of the cosmos and the place of the citizen body within it, even in vastly different societies such as Sparta and Athens. Carefully selected religious space, which aimed to evoke the deep time of the religious or even mythical past, was empowered by divine presence as narrated in myth. In this way, human space was temporally and spatially linked with the cosmos. During ritual performance, the visible participation of the rotating cosmos seems to have linked ritual to the most significant phases of constellations – not haphazardly chosen constellations, but instead ones which were in some way connected to the specific festival and divinity. All this was facilitated by architecture which structured religious space and the cognitive environment, while guiding the participant's outlook towards vantage points in the horizon.

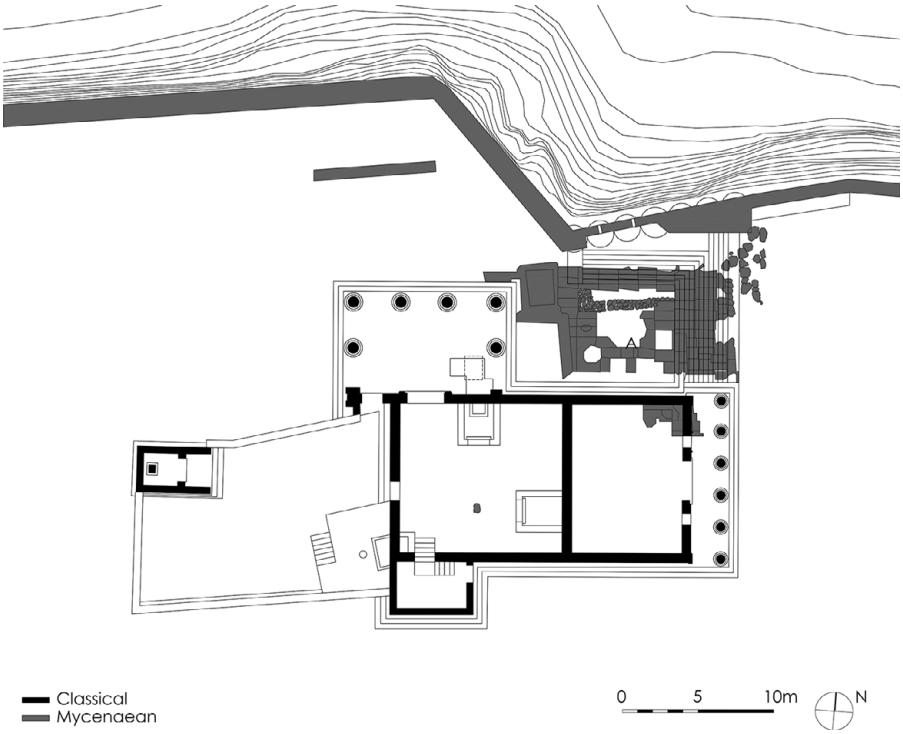
The interweaving of festival timing, ritual performance, and myths forged a cosmological narrative, triggering collective remembering and, ultimately, shaping ritual experience and cultural memory. Ritual re-enactment performed in the festivals discussed here narrated cosmically significant events and awakened collective identity. The meanings and memories embodied in the Athenian Acropolis (particularly as expressed in the festivals of the Panathenaia and Arrephoria) and the sanctuaries of Artemis Orthia in Sparta and Messene were instrumental in expressing and shaping civic and ethnic identity. We saw in previous chapters that there is no such thing as a person with a singular identity, and that identity is formed through a vast number of parameters (e.g., class, ethnicity, age, gender). Thus the discussed associations as tools of shaping identity and as pedagogical mechanisms are perceived only as one part of a much more complex nexus of identity-shaping factors, as are ideology and experiences which negotiate reality.[1]

THE ATHENIAN ACROPOLIS: AUTOCHTHONY AND IDENTITY IN THE PANATHENAIA AND ARREPHORIA

The myths of the first earth-born kings of Athens (Kekrops, Kranaos, Amphiktyon, Erichthonios, and Erechtheus) created indisputable links between the Athenians, the Athenian soil and landscape, and demonstrated the eminence of autochthonous myths in Athenian identity. The serpentine characteristics of mythical royal ancestors (Kekrops and Erechtheus/Erichthonios)[2] grounded the Athenian relationship with the Attic soil.[3] The idea of autochthony was fundamental to Athenian identity, creating a special relationship between the people and their land and landscape, as well as structuring perceptions of their place within the cosmos.[4] The dwelling place of the early Athenian kings, the Acropolis, remained the focal point of the major religious festivals in Athens and from the Classical period became the arena of Athenian display of power, culture, and wealth throughout antiquity. The key location of the sacred rock ensured its domination over the landscape as a visual point of reference, crowning the Athenian horizon, always visible, ever-present.

The Erechtheion, the Panathenaia, and Draco

The Erechtheion is a thoroughly atypical, unique structure architecturally and spatially. Its nonconformity goes beyond the unusual number of cults it housed and its unusual architecture. Unlike most Greek temples, which display a regularity in shape and architectural form, every side of the structure is different, meaning that it cannot be appreciated from a single viewpoint. Only through movement can the visitor appreciate its shape and form.



31. Ground plan of Classical Erechtheion including Helladic remains of theatral area and paving (adapted after Holland 1924 I and Stevens 1946 by Socratis Tsacos)

Sophia Psarra has demonstrated, for example, that upon arrival at the Acropolis in the fifth century BCE, the Erechtheion's monumental north porch was only visible when standing in front of the Propylaia.[5] The structure is awkwardly oriented, too close to the north wall (ca. 12 m) and visually sidelined by the grander Parthenon, despite being the most important cult structure on the Acropolis. In the north-east, the retaining Acropolis wall bends sharply inwards, spatially isolating the north porch, as it reaches as close as 4 m to the Erechtheion (Figure 31). Yet despite these idiosyncrasies, the structure played a central role in the cults and rituals performed at the Acropolis. Its two porches are placed at almost cardinal points: the entrance of the east *cella* faces almost due east, and the north porch almost due north. The more monumental north porch leads to the west *cella*, which – based on Pausanias – contained the most sacred spots of Athenian mythology: the crypt to the tomb of Erechtheus, Zeus' thunderbolt marks, Poseidon's salt sea and trident marks, and the most ancient *xoanon* of Athena.[6] The *cella* was adjacent to Kekrops' tomb and the sacred olive tree. Wilhelm Dörpfeld and Leicester Holland believed that the architect of the Erechtheion determined the entire building based on it being symmetrical along the axis of the north porch and the area of the west *cella*.[7] It is beyond the aims of this study to discuss in detail the pros and cons of the

various interpretations relating to which *cella* housed the cult of Erechtheus and that of Athena Polias; this has been done in much detail elsewhere.[8] Instead, we are concerned here with understanding how the structure was integrated in its earthly and celestial surroundings.

Archaeological finds attest to the use of the vicinity of the Erechtheion as habitation and burial ground in the Bronze Age.[9] Children's graves from this period have been located near the Erechtheion and the citadel's west edges.[10] Although children and infants were commonly buried within the confines of Bronze Age domestic structures,[11] there is scholarly disagreement on the presence of a Bronze Age palatial structure in the area of the Erechtheion. What can be safely concluded, though, is that the extant Classical structure is known to have had at least one predecessor. This is mentioned by Herodotos and is also confirmed archaeologically: the architectural remains under the foundations of the Erechtheion make it clear that the present structure was fitted against something older than itself.[12] Despite its awkward positioning, this north section of the citadel evidently featured in ritual, funerary, and domestic activity during the Helladic period. Late Helladic potsherds and Middle or early Late Helladic remains of a clay-floor room were identified north of the Classical Erechtheion in the space between the north and east porches (Figure 31). Drawing on these identifications and other finds located under the Archaic temple of Athena, the area has been interpreted as a shrine with an altar (A in Figure 31) and was built at the same time as the paving.[13] In conjunction with the framing of the paved area by a continuous set of a bank of steps, constructed probably on three sides and possibly for accommodating spectators, the remains are interpreted as evidence of ritual activity.[14] The capacity of this hypaethral theatral area has been estimated to be able to accommodate a maximum of 150 standing onlookers.[15] Initially, the theatral area was approached through the north Acropolis entrance, which remained in continuous use from the Helladic period to at least the fifth century BCE.[16] Gorham Stevens' remark that 'no other pavement in the vicinity of the Erechtheion was constructed with such lavishness and care' stresses the importance of the area during this period.[17] The types of activities performed in the theatral area remain unknown, but its construction as a space surrounded by rows of steps indicates some kind of ritual performance and the presence of an audience. The theatral area was repaved with marble in the Classical period and the surrounding steps were rebuilt as an integral part of the Erechtheion's building programme. Apart from facilitating access between the east part of the sanctuary and the north porch, which has a ground floor level difference some 3 m below the east side, the steps and the paved area adjacent to the north porch are also believed to have been integral to rituals in the Classical period (Figure 31).[18]

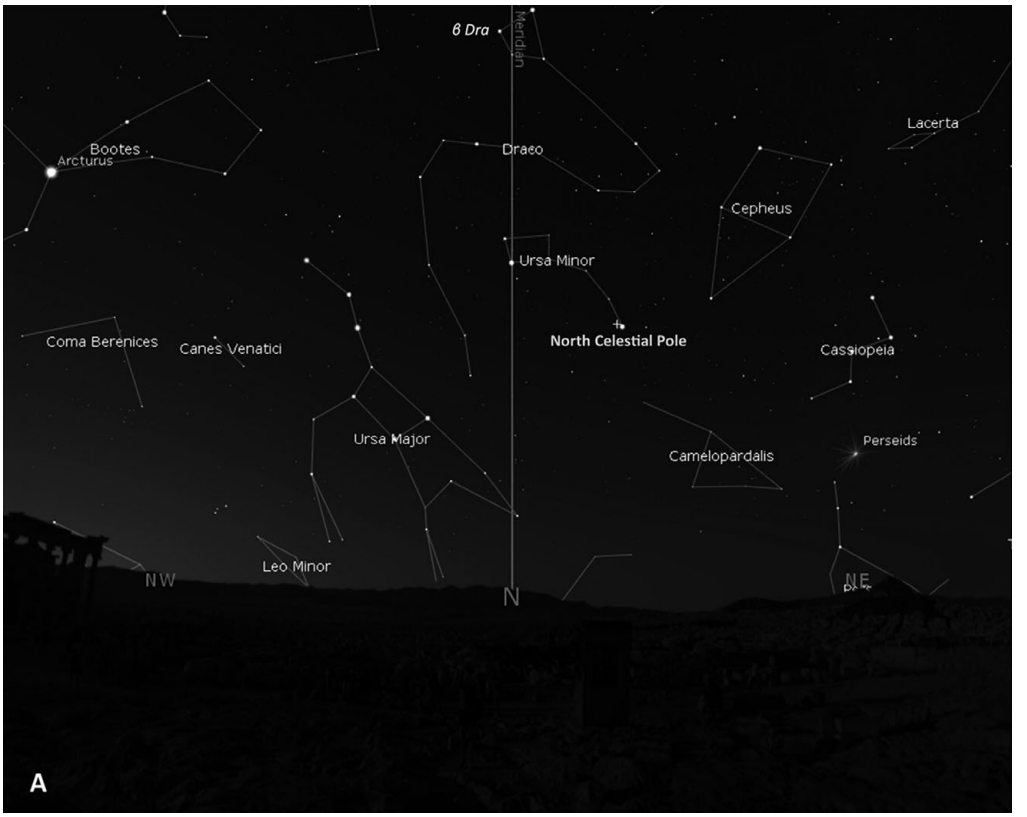
The worship of serpentine king Erechtheus and Athena is the earlier attested cult, with archaeological finds and written sources converging in its antiquity.

Homeric references to a joint cult of Athena and Erechtheus under the same roof indicate a Mycenaean cult tradition of the king and 'his house goddess',[19] traces of which are argued to link to the 'house-guarding snake'.[20] The Panathenaia, the major Athenian festival in honour of Athena, also seems to have been founded at an early date. The Athenians credited its foundation and the *peplos* ceremony to Erichthonios. The cult is securely attested in the Archaic period, when the sixth-century temple to Athena was constructed. The Great Altar also dates to the same period, with its location and size dated to at least the seventh century BCE, and a history of presence stretching as far back as the eighth century and perhaps earlier.[21] As is the case with many other religious sites founded on Mycenaean remains (for instance, Eleusis, discussed in the following chapter), ritual activity cannot be traced without interruption from the Mycenaean to the Archaic period. The material discussed here thus does not assume a link between the Helladic ritual activity in the theatral area and the Classical performances; instead, it aims to highlight the persistent importance of this space on the Acropolis.

The myths of Kekrops (the first Athenian king and first man of Attica) and the story of Erechtheus/Erichthonios (*drakon*, a half-snake, or a human guarded by snakes)[22] are interpreted as evidence for an early snake cult on the Acropolis.[23] Erichthonios (the founder of the Panathenaia)[24] was viewed as the personification of the ancient inhabitant of the Athenian Acropolis, the sacred snake, which lived under the Classical Erechtheion and was offered honey cakes.[25] Inside the Classical Parthenon, Erechtheus maintained his close connection with the goddess, being famously depicted in the form of a snake coiled under the shield of Athena's gold and ivory statue.[26]

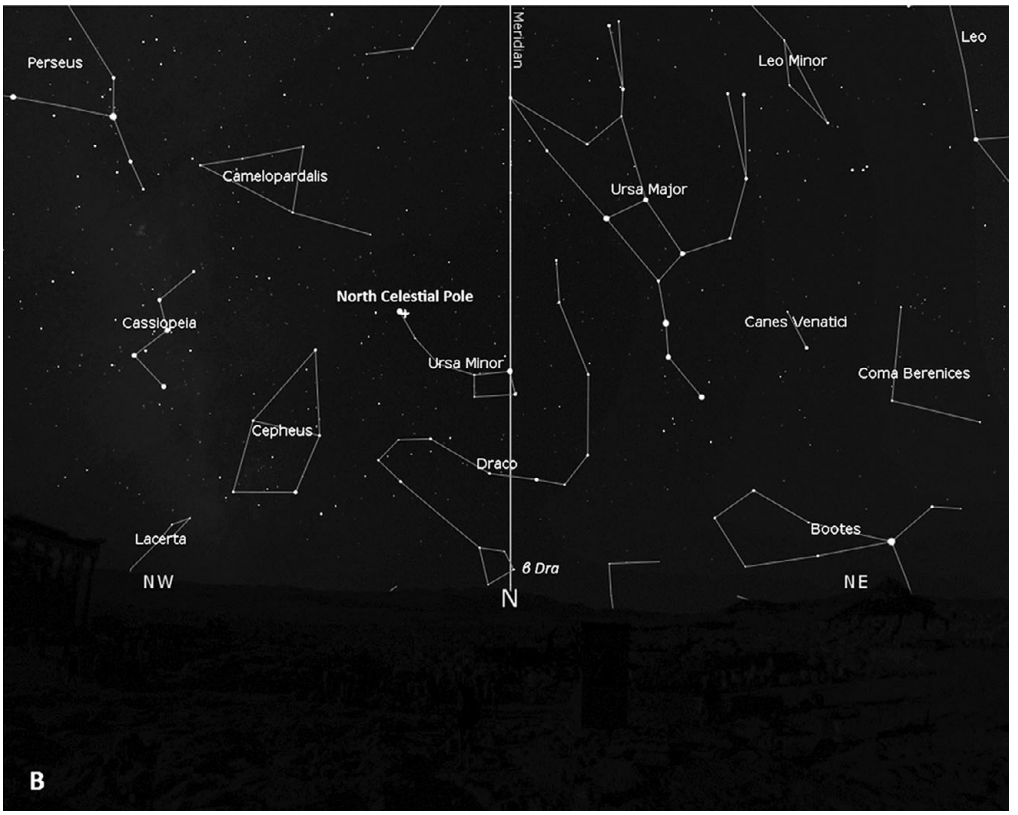
From the Acropolis, the constellation of Draco is best viewed by standing in front of the Erechtheion's north porch or in the space between the north porch and the Great Altar. The Classical north porch was oriented towards Draco (azimuth 353°, dec. +54°), within a degree of the declination of β *Dra* in Draco's head (+53° 17′) in antiquity. This star is the first to cross the meridian during the constellation's culmination.[27] Draco is one of the largest constellations in the sky, representing a giant snake (Figure 32). Ancient descriptions of the stars comprising Draco (*Ophis* or *Drakon* in ancient Greek)[28] confirm that the ancient and modern constellations were almost identical.[29] The Acropolis north retaining wall was no higher than today,[30] allowing an unobstructed view of the horizon from the north porch or nearby, despite its proximity to the wall.

One of Draco's katasterism myths associates the constellation with Athena, the 'mistress of snakes'.[31] The myth narrates Athena snatching a snake from the giants during the Gigantomachy and whisking it up to the sky, thus creating the constellation of Draco.[32] The same myth and theme of Athena's



32. Draco during its upper (A) and lower (B) culminations. The ancient constellation included also *μ Draconis*.

role in the Gigantomachy were central in the Panathenaic festivities.[33] Scenes from the battle were woven on her *peplos* and were also carved on the Classical Parthenon's east *metopes*. Further links are attested in the second century CE by Aelius Aristides, who notes that during Erichthonios' reign, 'the death of Aster, the giant' (believed to have been killed by Athena during the Gigantomachy) was commemorated in a celebration, which Peisistratos transformed into the great festival of the Panathenaia in the sixth century. This late reference is supported by Aristotle, who associates the games of the Panathenaia with Aster's death by Athena.[34] The name of the giant appears in the sources as either Aster (star) or Asterios (comprised of stars). An even later source refers to a belief that Draco is the katasterised snake Athena sent to guard Erichthonios.[35] It is possible to confirm this link between Draco and the goddess of the Panathenaia through the timing of the festival in relation to the constellation's most significant phases. Hekatombaion, the first month of the Athenian civil calendar, started on the first new moon after the summer solstice (our late June–early July). The end of the month witnessed



32. (*cont.*)

the greatest Athenian religious festival, the Panathenaia, with the main part of the festival commencing on Athena's birthday, after the sunset of 27 Hekatombaion (our early–mid August).[36] Because the festival was celebrated as an annual (one- or two-day) celebration and every four years as a longer and more spectacular four-day (or more) celebration, the first day of the festival is not certain. We are informed, however, that the highlight of the festival was the twenty-eighth of the month.[37] During the Great Panathenaia, the first four days were devoted to musical, athletic, and dancing contests. On the fifth day, the 27 Hekatombaion, the torch race, performed by forty runners, marked the beginning of the Panathenaic festivities proper, starting after sunset at the Academy and terminating on the Acropolis with the lighting of Athena's altar by the hand of the torch race victor. This was followed by an all-night celebration of women dancing and singing (*pannychis*). The nocturnal rituals which took place during the festival (e.g., the *pannychis* and the torch race)[38] assert the presence of visitors at night on the Acropolis, which indicates that festival activities could have coincided with sightings of the constellation.

Draco, a circumpolar constellation, does not rise or set. Instead, it culminates (i.e., crosses the meridian) as it coils around the north celestial pole, having thus a rotational movement around its axis (Figure 32).[39] The ancient Greeks were familiar with the movement of circumpolar constellations from an early date. Ursa Major, the 'never-bathing in the waters of the Ocean' Bear,[40] another circumpolar constellation, is never seen to dip below the horizon into the sea; hence, like Draco, it never sets or rises.[41] The calendrical significance of circumpolar constellations lies in their first and last visible culminations before dawn and after sunset, which correspond to the heliacal rising and setting of non-circumpolar stars. The observation of a culmination is first mentioned in Hesiod.[42] In July–August, when the Panathenaia took place, no other suitable stars or constellations can be linked with the myths and timing of the Panathenaia apart from Draco.[43] Similarly, all circumpolar constellations apart from Draco culminate either during the day or several hours after sunset during this period.[44]

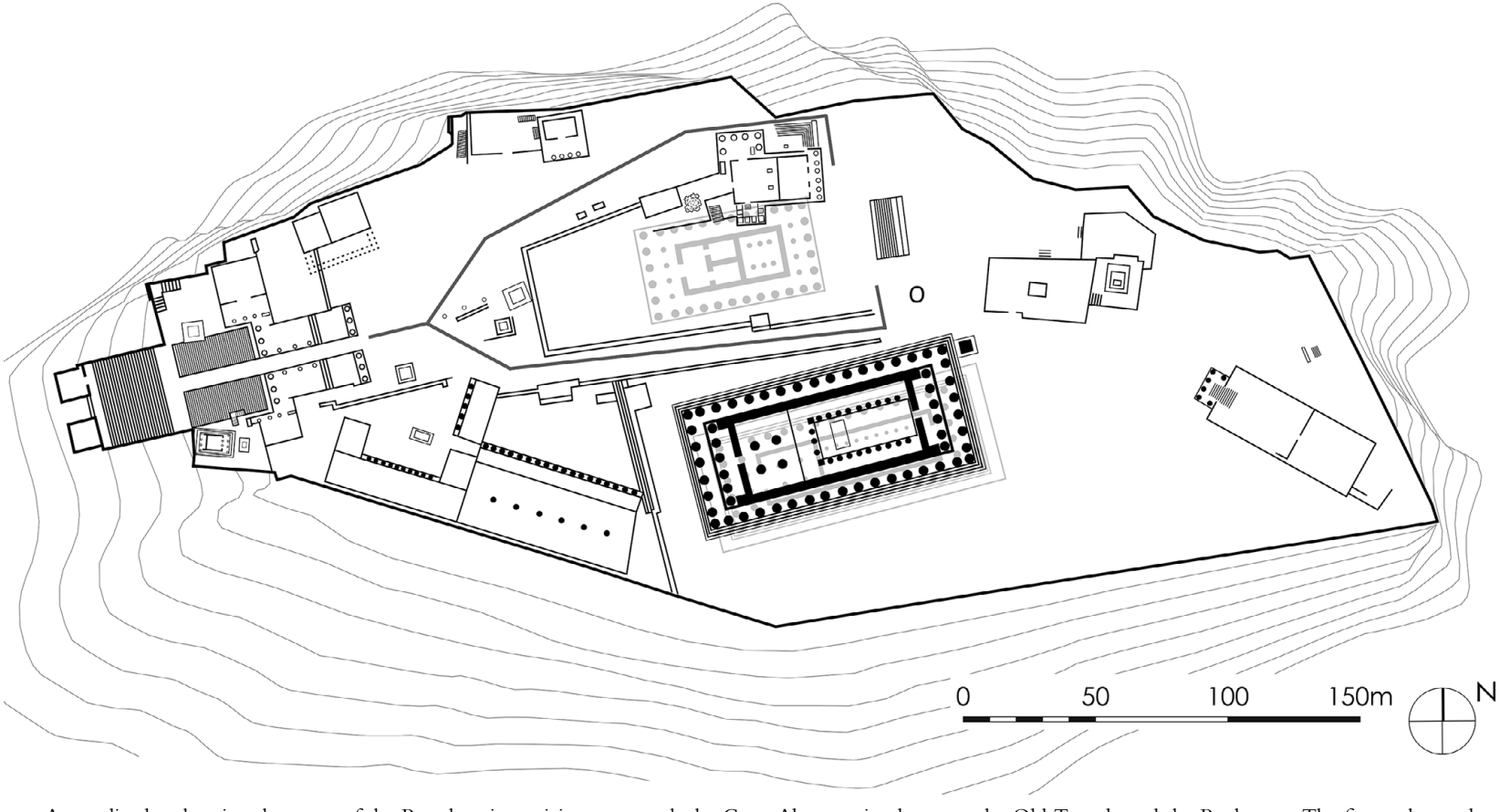
The end of the ancient Greek months occurred during the last few days of the waning moon, or even on a moonless night, in order to start the new month with the first visible new moon. This arrangement meant consistently dark nights at the end of the month. In the case of the Panathenaia being celebrated on the last three or so days of Hekatombaion, the particularly low moon luminosity, or even its absence, would have increased the visibility of the stars.[45] As with any circumpolar constellation, Draco's transitional periods, during which its culminations move from visibility to invisibility and vice versa, are the phases in its movement that would have been significant. Sunset in early–mid August, when the Panathenaia would be celebrated in an average year, was between 18:30 and 18:50. The upper culmination of the first star in Draco's head, *β Dra* (i.e., the culmination of Draco's head in an upright position), crossed the meridian a few minutes later, approximately at 19:15, and the lower culmination of its tail at 21:30 (Figure 32). In the course of these two hours, the celestial snake's head and tail would be seen to cross the vertical axis of the observer. The Panathenaia took place around the time of Draco's last visible upper culmination. After this time and for the next seven months, the constellation's upper culmination was not visible, as it occurred during the day (Table 5.1). Year 419–18 BCE is the earliest recorded start of a year, beginning on 20 June (proleptic Julian date), just a few days before the summer solstice.[46] In this year, the Panathenaia was held on 17 July, when Draco's upper culmination started exactly two hours after sunset. In the years which started very late, such as 416–15 BCE – which has the latest recorded start of a year, on 15 August (proleptic Julian date)[47] – the Panathenaia was celebrated on 11 September. An hour after

TABLE 5.1. *Timings of the culminations of Draco's head in 600–300 BCE. Culminations in grey occur during the day and are not visible. Culminations in black occur during the night*

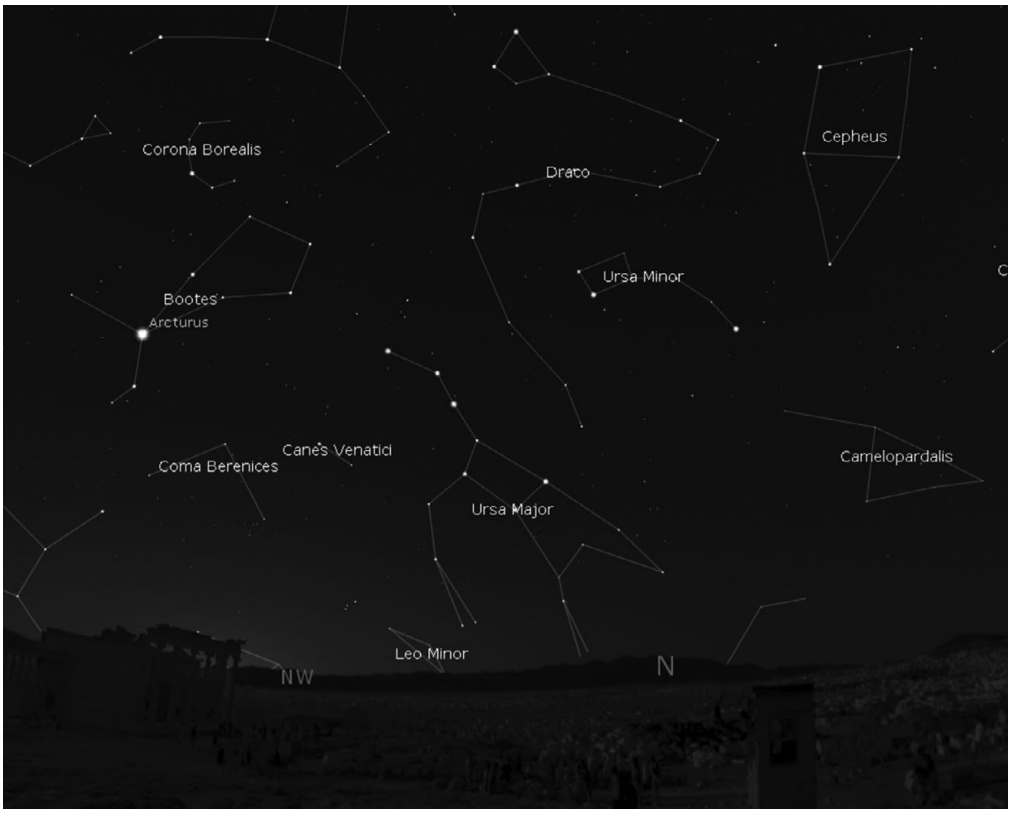
Attic months	Festival	Upper culmination	Lower culmination	Gregorian months
(1) Hekatombaion	Panathenaia	21:00–19:00	9:00–7:00	July–August
Metageitnion		19:00h–17:00	7:00–5:00	August–September
Boedromion	Genesia (5)	17:00–15:00	5:00–3:00	September–October
Pyanepsion	Chalkeia (30) *peplos* weaving starts	15:00–13:00	3:00–1:00	October–November
Maimakterion		13:00–11:00	1:00–23:00	November–December
Poseideon		11:00–9:00	23:00–21:00	December–January
Gamelion		9:00–7:00	21:00–19:00	January–February
Anthesterion		7:00–5:00	19:00–17:00	February–March
Elaphebolion		5:00–3:00	17:00–15:00	March–April
Mounychion		3:00–1:00	15:00–13:00	April–May
Thargelion	Kallynteria (22) Plynteria (25)	1:00–23:00	13:00–11:00	May–June
Skirophorion	Arrephoria (3?)	23:00–21:00	11:00–9:00	June–July

sunset, when it was dark enough to observe, Draco was seen in an upright position, having crossed the meridian just before sunset, and its tail culminated (lower culmination) within two hours after sunset.

Upon transgressing the Propylaia, the passageway formed between the Parthenon to the immediate right and the Erechtheion wall (and remains of the Old Temple) on their left led Classical visitors to the Great Altar, in the east part of the Acropolis (Figure 33). As visitors arrived at the north-east of the Parthenon, the view unfolded, revealing the north-eastern and eastern horizons and, along this, the celestial dome. We can only guess where the more than a thousand people participating in the Panathenaia gathered on the Acropolis.[48] It has been suggested that the main festivities took place in the area between the Classical Parthenon, the Old Temple of Athena, and the porch of Athena Polias (Figure 33).[49] At least since the fourth century BCE, the *hecatomb* sacrifice at the Great Altar was the culmination of the festival, making this suggestion plausible.[50] From there, Draco's dominance of the night sky was easily detectable. Figure 34 shows the horizon as witnessed



33. Acropolis plan showing the route of the Panathenaia participants towards the Great Altar, passing between the Old Temple and the Parthenon. The figure shows also the alternative route leading to the Great Altar via the Erechtheion's north porch (by Lloyd Bosworth).



34. Reconstruction of the north section of the night sky as visible from the Acropolis at the time of the Panathenaia, one hour after sunset (observer standing at point O in Figure 33) between 600 and 300 BCE.* For colour version, see the plate section.

at the end of the Panathenaic torch race (one to two hours after sunset). Wolfram Hoepfner and, more recently, Henrik Gerding have argued that the area of the Old Athena Temple ruins was deliberately left as a large open space in order to facilitate the gathering of the Panathenaic festival participants at the festival proceedings (e.g., the sacrifices offered at the Great Altar and the dedication of the *peplos*).[51] The absence of a structure in that area following the destruction of the Old Athena Temple created an open space sufficient for this gathering in the area to the west of the Great Altar.

The area of the Acropolis from where Draco was best observed links the celestial snake and the festival of the Panathenaia. The documented presence of a snake cult in the Acropolis dates to the earliest iconographic evidence of 'snakes' and their association with Athena in the sixth century BCE, a time when the Gigantomachy theme also flourished.[52] To this century date also

* Minor changes to the position of the stars, not visible to the naked eye, would have occurred during these years because of axial precession.

the first representations of the Giants with serpentine features, as depicted on Attic vases showing various gods fighting serpents. Athena is already at this time associated with the Gigantomachy, fighting against snakes, being aided by them, and presiding over them (e.g., Kekrops, Erichthonios, and the city's guardian snake, believed to have lived in the Erechtheion).[53] The half-man, half-snake creatures and the two great snakes occupying the corners of the Archaic Hekatompedon pediment underline the importance of serpents in the Acropolis,[54] particularly if we accept Daniel Ogden's suggestion about the prominence of the idea of the Gigantomachy as a battle of serpents.[55] We discussed previously that the cosmic battle between the Olympians and the Giants was of such importance to the festival that scenes of this theme were woven into the *peplos* dedicated to the goddess. At the time of the celebrations, the celestial representation of one of these Giants – whose katasterism myth also associated him with the goddess – in the form of Draco was observed at its most important annual phase from the Acropolis. Space, time, and ritual experience seem to entwine, tuning ritual performance with the rotating cosmos. This other dimension of the festival's cognitive environment links the cosmos with the earthly location, taps memory, and strengthens Athenian identity.

The Daughters of Erechtheus, the Arrephoria, and the Hyades

The second most important cult period on the Acropolis was the time of the three purificatory, initiatory festivals of the Kallynteria, Plynteria, and Arrephoria. These consecutive, secret, nocturnal rites (associated with pubescent girls in Athena's service) commemorating the daughters of Kekrops (Aglauros was linked with the Kallynteria and possibly the Plynteria and Pandrosos with the Arrephoria)[56] involved also the re-enactment of the myth of Athena entrusting newborn Erichthonios to the three daughters of Kekrops.[57]

The Arrephoria, the culmination of the three rites, was celebrated in the two weeks between the last few days of Thargelion and the beginning of Skirophorion.[58] The festival involved the nocturnal carrying of the basket with secret contents to the sanctuary of Aphrodite.[59] Spatially, the rituals were associated with the north and east part of the Acropolis, the location of the shrine of Athena Polias and the Great Altar. The Kallynteria, the first of the three nocturnal rites, was held at the time of the most astronomically significant period of the Hyades and the constellation of Auriga. Auriga was the stellar representation of Erechtheus/Erichthonios.[60] The heliacal rising of the Hyades occurred between our 6 and 8 June in the years between 700 and 300 BCE (Table 5.2).[61]

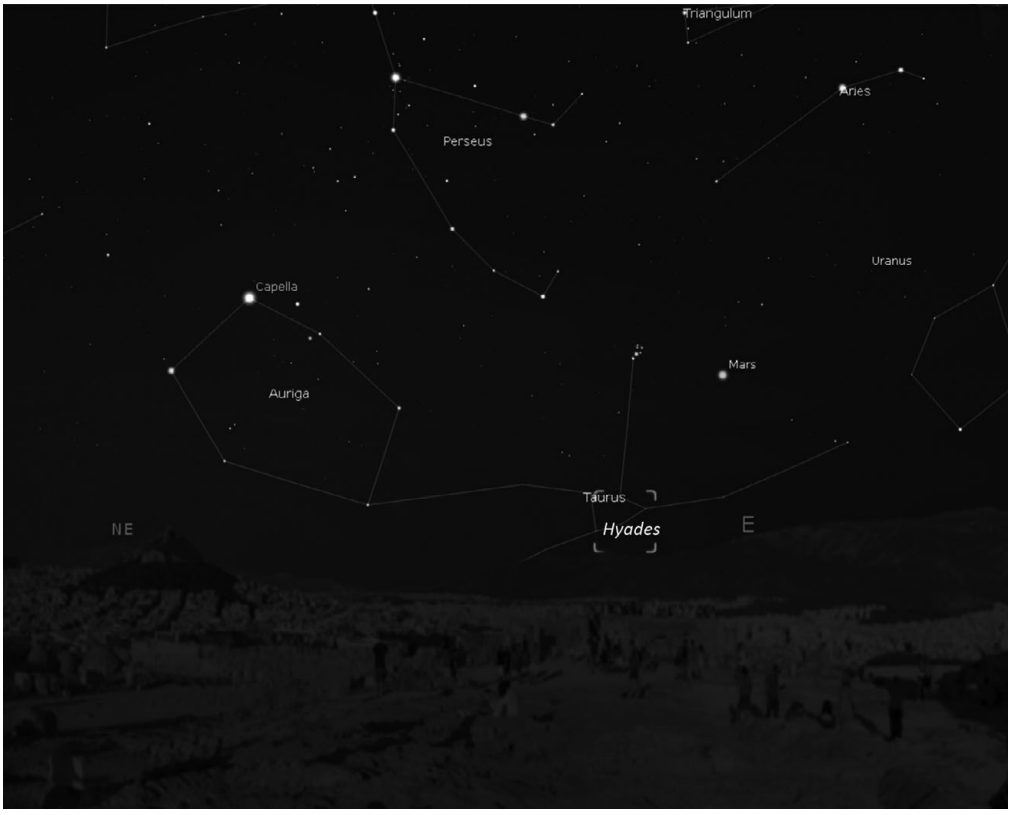
The celestial figures of Erechtheus/Erichthonios and the daughters of Kekrops appeared, rising just above the eastern horizon of the Acropolis, at the end of the night, a few minutes before dawn, when the rites would be coming to completion. Rising Auriga is seen in the north-east section of the

TABLE 5.2. *Calendrical correlation between festivals involving young girls and the movement of the Hyades and Auriga, visible from the Acropolis' south, south-east, east, and north-east horizons, in the years 700–300 BCE (after Boutsikas and Hannah 2012)*

Attic months	Festivals	Hyades	Auriga	Gregorian months
(1) Hekatombaion	Panathenaia			July–August
Metageitnion				August–September
Boedromion	Genesia (5)			September–October
Pyanepsion	Chalkeia (30) *peplos* weaving starts	**Acronychal rising** (19–20 Oct.) **Cosmical setting** (5–7 Nov.)	**Acronychal rising** (17–19 Oct.)	October–November
Maimakterion			**Cosmical setting** (22–24 Nov.)	November–December
Poseideon				December–January
Gamelion				January–February
Anthesterion				February–March
Elaphebolion		**Heliacal setting** (6–8 April)	**Heliacal setting** (24–26 April)	March–April
Mounychion		**Invisibility period** (9 April–5 June)		April–May
Thargelion	Kallynteria (22) Plynteria (25)	**Heliacal rising** (6–8 June)	**Invisibility period** (23 May–2 June) **Heliacal rising** (3–5 June)	May–June
Skirophorion	Arrhephoria (3?)			June–July

night sky. From the Athenian Acropolis this part is best observed from the area occupied by the Erechtheion's north and east porches.[62] This is also the space where the Kallynteria, Plynteria, and Arrhephoria were performed.[63] The elevation of the Acropolis hill offers uninterrupted views to the horizon. The Hyades rise in front of the Parthenon and the area of the Great Altar (the Parthenon's azimuth is 77.5° and that of the Great Altar ca. 82°) (Figures 35 and 36).

35. Eastern horizon in front of the Parthenon (photo by E. Boutsikas)

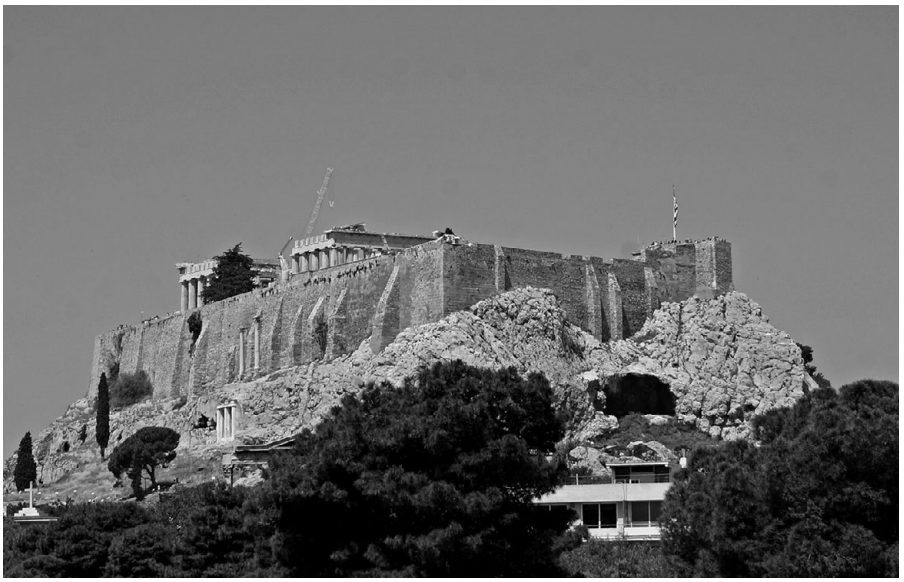


36. Reconstruction of the Acropolis eastern horizon and night sky just before dawn at the time of the Arrephoria. For colour version, see the plate section.

Five months before the Kallynteria and nine months before the Panathenaia, during the Chalkeia, held on the last day of Pyanepsion (October–November), a ceremonial beginning of the weaving of Athena's *peplos* took place, during which the *peplos* was set on the loom.[64] Within the space of twenty days (mid-October to early November), as many as three important events of the two constellations may have taken place. In most years all would occur during Pyanepsion: the acronychal rising of the Hyades (15–17 October) and Auriga in the east (18–20 October) and the cosmical setting of the Hyades in the west (5–7 November) (Table 5.2). In the years when the month started early or late, at least one of the Hyades events was visible either just before dawn or after sunset, at the time when the ceremonial weaving of the *peplos* ritual was performed.

Euripides' reference to the katasterism of Erechtheus' daughters as the Hyades star cluster in *Erechtheus* is followed by the proclamation that annual rites (sacrifices and dances performed by young girls) are due to the girls who are to be honoured as goddesses.[65] Indeed, a new fragment of the late-fifth-century BCE Athenian sacrificial calendar has revealed the only known epigraphical reference to offerings made to the Hyakinthidae (on the ninth day of an unknown month).[66] A further link between the sacrifice of the two groups of girls (the daughters of Kekrops and of Erechtheus), jumping from the east part of the Acropolis, and their katasterism is found in the location of the cave-sanctuary of Aglauros, directly below the east Acropolis wall.[67] According to George Dontas, this would have been the location from which the girls were believed to have jumped.[68] The cave of Aglauros, like the east-facing structures of the Acropolis above it, also faces the rising Hyades (Figure 37).[69] The third-century-BCE stele unearthed in 1980 in the vicinity of the Aglaureion lists the four most important divinities offered sacrifices there: Aglauros, Ares, Helios, and Apollo.[70] Nocturnal performances were also integrated in the festival of Aglauros. As the Aglaureion stele informs us, a *pannychis* was part of the celebrations.[71] Even if we consider tenuous the idea that the cave marked the spot where the young girls died after jumping, it is unlikely that the ancient Greeks had not noticed the rising Hyades in front of the Parthenon, the Great Altar, and the Erechtheion's east porch.[72] In fact, the ancient sources confirm the importance of this horizon. Herodotos calls the eastern part of the Acropolis 'the front' and in conjunction with Aeschylos' 'gods who face the east' the significance of the eastern horizon on the Acropolis is strengthened.[73]

Christiane Sourvinou-Inwood refuted the identification of the Hyakinthidae with the Hyades and argued instead that the scholion in



37. The Acropolis east slope and cave of Aglauros (photo by E. Boutsikas)

Aratus which makes this identification is mistaken.[74] Instead, she suggested that the passages referring to the Hyades in lines 107–8 associate the star cluster with the Eleusinian Mysteries. We will discuss in Chapter 6 the difficulties of this assertion, aside from the movement of the Hyades not being linked with the timing of the Mysteries. To associate a cult with a constellation which was not visible at the time of the festival defeats the purpose of such a connection – all the more so since Sourvinou-Inwood agrees that the night sky played an important role in the Eleusinian Mysteries.[75] Conversely, considering the timing of the Arrephoria in the period during the heliacal rising of the Hyades, the orientation of the Great Altar, the story related by Euripides, and the location of the cave-sanctuary of Aglauros, we are led to connect the star cluster and the Arrephoria. This conclusion ties in also with the common scholarly interpretation of the Euripidean passages as discussing the katasterism of the daughters of Erechtheus.

It transpires that the Parthenon, the Erechtheion east porch, and the Great Altar (as well as the Archaic temple of Athena) were oriented towards the constellation of the young maidens, who in myth were placed by Athena in the night sky as the constellation of the Hyades. The spatial correlation between the architecture and the star cluster is affirmed by the timing of the celebration of festivals associated with pubescent girls in Athena's service.

Overview of the Athenian Acropolis within the Cosmos

The ancient reference stating that the images of Athena on the Acropolis faced east is interpreted as referring to the image of Athena Polias and the gold and ivory statue of Athena in the Parthenon.[76] The astronomical and temporal analysis of the Athenian Acropolis has shown that a spiritual experience was in store for the participants of the Panathenaia and the Arrephoria. The ascent of the Panathenaic procession on the Acropolis offered an evolving view of the city. The festival participants transitioned from the enclosed and limited horizons of the city through the ascent to the Propylaia, followed by the arrival at the Great Altar, where the higher ground of the Acropolis rock facilitated the unravelling of the horizon. This movement through space cannot but draw attention to the surrounding land and sky views, and, at night, to the visible astronomical configurations.[77] The N–NE part of the Acropolis where Draco is best observed is also the area where the Panathenaic offerings and nocturnal rites were centred in the Classical period.

The annual significant events of the three celestial figures of Athenian identity – Draco, the Hyades, and Auriga – occurred during the celebration of the Panathenaia, Kallynteria, Plynteria, and Arrephoria. Athenian identity, history, and cultural memory were not simply re-enacted during the festivals of the Panathenaia and Arrephoria: a dialogue was created through the unequivocal participation of the cosmos. Current cosmic order was affirmed during the Panathenaia, the Athenian festival of social unity and order founded by the earth-born Erichthonios, and commemorating also Asterios' killing in the Gigantomachy. In the myths narrating Athena's participation in the Gigantomachy we witness the destruction of a strange, fearful, primordial past to make way for the civilised and properly ordered present. Ancient Greek narrations of these events continued to recount the implications of this long-vanished era for social order in the present. The cosmological assertions of Athena's triumph, which was also the triumph of current cosmic order, were witnessed in the finely tuned timing of Draco's movement during the Panathenaia, and were also demonstrated throughout the sculptural decoration on the Acropolis and on Athena's *peplos*.[78]

That the Athenian Acropolis played a role in Athenian identity and memory is not a novel idea. But, by considering external factors which may have supplemented the internal cognitive processes, this analysis builds on this idea. The celestial links established a dialogue between the most important Athenian religious space and the cosmos, knitting the experience and memory of these festivals together with Athenian identity and autochthony. Athena's epiphany in the *Erechtheus* affirms her special relationship with Athens.[79] The timing of the rites acquires a cosmological significance whilst reaffirming their

importance. The commemoration of Erechtheus' myth during the Arrephoria and, consequently, Athena's intervention as described in the tragedy, confirmed divine aid; this commemoration alluded to the Athenians' divine parentage and strong relationship with their patron deity. The message was clear: divine authority had the power to circumvent conventional human existence. By converting an act of death to an event of continuously repeated posterity – thus to an act worthy of immortality – divine authority was capable of transcending conventional mortal capabilities. All Athenians knew these myths, hence all Athenians had the potential to experience, visually and spiritually, the unique harmonisation of the cosmos in a ritually charged atmosphere. At the same time, the practical use of these links cannot be refuted. The movement of these constellations could have also functioned as a temporal signifier of the arrival of the correct time for the celebration, just as we saw in the previous chapter in the case of Apollo, the sun, and Delphinus. In a culture where astronomical observations were an integral part of everyday life for all, regardless of social standing, literacy, education, or gender, it seems unlikely that the functions of these astronomical links – practical (timekeeping), religious (observations tapping into katasterism myths), or both – would remain inconspicuous.

MEMORY AND IDENTITY IN FEMALE INITIATION RITES OF SPARTA AND MESSENE

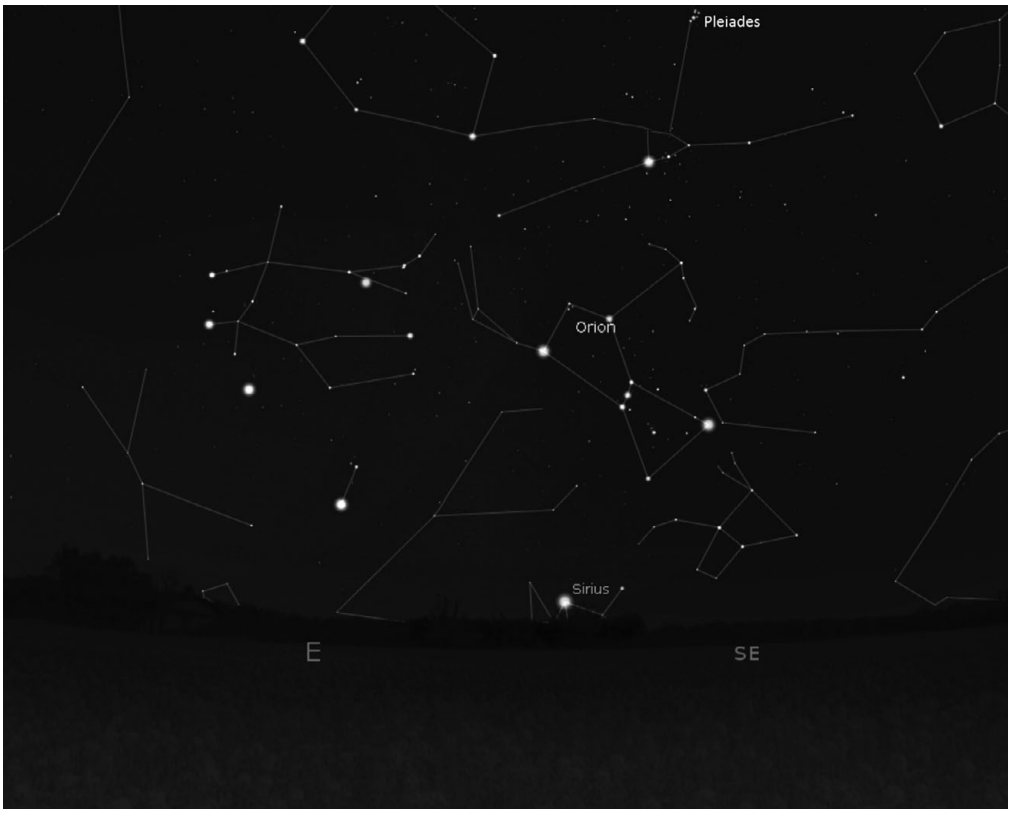
Knowledge of Spartan cosmology relies heavily on Alkman. His seventh-century-BCE cosmogonic views survive only in poorly preserved fragments which, nonetheless, are of seminal value to our understanding of Spartan beliefs about the cosmos. Alkman is also the poet of the well-known but equally incomplete *Partheneion*, a cult-song composed to narrate and accompany the ritual performance of a chorus of young Spartan girls.[80] The poem, which has caused much vexation for scholars, is of particular importance, as it contains cosmic references in relation to ritual. It exemplifies Spartan female initiatory rituals and determines the time of the performance through the use of astronomical references, integrating ritual performance into the movement of the cosmos. Alkman's ritual culminates as the young girls dedicate their offerings to the goddess. Consequently, the performance required at least the final part of the ritual to unfold near or around an altar. There is critical scholarly disagreement on the dedicatory object, the time of the ritual, the social context and purpose of the performance, and the identity of the goddess. Although the present study cannot contribute to all these long-standing debates, it presents an analysis of the ritual's astronomical references, which assists in affirming the identity of the goddess and the location of the ritual, and offers a cognitive reconstruction of the final and most ritually charged moments of the

performance.[81] Since we are dealing with a cult which was also eminent in Messene, the analysis will assist in drawing conclusions about influences and the use of these cults in the formation of identity and history.

Alkman's Partheneion: Ritual Timing and the Identity of the Goddess

The poem in its extant, incomplete form appears to be structured in two parts: the first, heavily damaged part includes the narration of a series of mythological events related to local Spartan tradition.[82] After a section which summarises a number of paradigmatic myths, the girl Agido is suddenly introduced in line 40 in an epiphany of light, appearing 'like the sun' (line 41). The second part (lines 36–101) is mainly dedicated to the verbal representation of the chorus' performance. The impressive appearance of the other named girl, Hagesichora, is also portrayed in terms of her beauty. The two girls are jointly called *Peleiades* (Πελειάδες, or Pleiades, line 60). Abundant controversy has arisen regarding the identity of the word *Peleiades*: 'For the Peleiades | as we carry the robe[83] to *orthria*[84] | [are] rising through the immortal night | and fight against us[85] like the star Sirius' (lines 60–3).[86] The translation 'the Pleiades ... are rising ... like the star Sirius', favoured by a number of scholars,[87] does not make sense astronomically, as the Pleiades are never seen to rise at the same time as Sirius. Every possible interpretation of this passage and of the identity of the *Peleiades* has been proposed. Identifying them with the star cluster of the Pleiades seems the most convincing and accepted.[88] Translating the word to mean the star cluster also makes more sense in relation to the star Sirius and to the cosmic references found earlier in the poem.[89] Even if we accept the use of the word as a collective name for the group of girls or cult title,[90] this does not contradict the simultaneous celestial reference to the star cluster. Patterson also notes that the interpretation of the name as the stars or as the chorus is not mutually exclusive.[91] The mention of the Pleiades leads to the conclusion that, at the very least, some common attributes between the mythical and astronomical Pleiades and the girls performing this ritual existed – otherwise, the use of the name would make no sense. The image of the young maidens racing against Sirius (lines 60–3) brings to mind the myth of the Pleiades, companions of Artemis, who were pursued by the hunter Orion and his dog Sirius.[92] This race resulted in the katasterism of the maidens by Zeus.[93] According to one version, Orion and Sirius were katasterised by Artemis and are still seen to chase the Pleiades across the night sky (Figure 38).[94] In sum, these lines tell us of a dedication of a robe taking place as the star cluster of the Pleiades rises just before dawn.

The reference to the rising Pleiades before sunrise, a few minutes before Agido, the maiden of the goddess of Dawn, summons the sun to rise



38. Reconstruction of the night sky showing the positions in which the Pleiades, Orion, and Sirius appear.

(lines 39–43, 60–3),[95] pinpoints the precise time of the rite in the day and year: the time of the heliacal rising of the Pleiades.[96] Agido calls upon the sun to witness the rite at the time the 'immortal' night (νύκτα δι' ἀμβροσίαν) comes to an end. In the next few minutes, the participants in the rite would witness the first light of the rising sun illuminating the eastern horizon. Any later in the day, or at a different time in the year and these words or references would make no sense. This event was visible on the Spartan horizon at the end of May.[97] In lines 40–3, the poem is explicit with regards to the significant light-darkness interplay which took place during these moments: Agido's light is so radiant that the spectators see her shine 'like the sun, which Agido summons to shine [rise]'. Brilliance needs darkness in order to be appreciated to its full extent. Alkman used the same play of light and darkness in his cosmogony, despite the noted difficulty in interpreting the surviving text.[98] Second, the goddess receiving the offering is the 'Lady of Dawn' (87, Ἀώτι).[99] The congruent epithets, *orthria* (61), 'Goddess of the Morning Twilight', and *Aotis*, suggest a divinity associated with light and the Dawn.[100]

On the basis of the translation of the words *orthria* and *Aotis*, which contain epithets of Artemis, the consensus is that the *Partheneion* describes a rite taking place at the sanctuary of Artemis Orthia in Sparta.[101] The troublesome word *orthriai* can also denote a variant form of the name Orthia.[102] The association of (Artemis) Orthia with the *Partheneion* rite also appears in relation to the item the girls dedicate. Robes were common ritual offerings in the Archaic and Classical period. We saw this to have been the case in the Panathenaic dedication of Athena's new *peplos*, a rite also associated with female ephebic initiation. Orthia and Artemis were similarly linked with ephebic initiation rituals in Sparta.[103]

The date of the *Partheneion* is concurrent with the most secure dating of the presence of Orthia's cult in Sparta.[104] The most ancient festival held at the sanctuary is believed to have been introduced during the early stages of Orthia's presence at the site, and probably before her association with Artemis. This is the festival referred to as the 'Procession of the Girls' (*parthenoi*), our knowledge of which is particularly scant owing to its early date.[105] Literary sources state that Spartan women brought their offerings to the goddess in a procession while singing a hymn to the Parthenos,[106] and they refer to the goddess as Parthenos Orthia (Παρθένος Ὀρθεία). Similarly, a number of inscriptions from the sanctuary of Artemis Orthia refer to this rite, indicating its importance.[107] The most complete dedicatory inscription of three limestone reliefs bearing carvings of horses, found in the sanctuary's Archaic stratum, makes the link between the goddess and *parthenoi* explicit.[108] The decline in female votives in the Spartan sanctuary of Orthia during the sixth century BCE seems to suggest the decline of female rites in favour of those involving male initiation in the later periods.[109] Yet, later sources mention the connection of the cult of Spartan Artemis with female initiatory rites, such as the story of the rape of Spartan girls in the shrine of Artemis Limnatis by Messenians during the reign of the Spartan king Teleklos.[110] The literary and archaeological material confirm a performance similar, if not identical, to the *Partheneion* rite, at least in the earlier periods of the sanctuary's cult activity (eighth to sixth centuries BCE). Perhaps after this date, when the shift to male initiation took precedence, the suggested links fell into disuse, or were altered in accordance with the needs of the new cults, but this conclusion remains tentative.

Although Orthia's cult is present in Sparta already in the Archaic period, the time when she is associated with Artemis is much less certain. The earliest epigraphical evidence of Artemis Orthia at the sanctuary dates to the first century CE,[111] but this is a peculiarity only present in Sparta. Messenaean Orthia was addressed as Parthenos and Artemis from the second century BCE,[112] and the connection of the two deities predates this evidence elsewhere in Greece. Artemis Orthia is attested from the fifth

century BCE in inscriptions from Attika, Argos, Epidauros, Arkadia, Elis, Megara, Boeotia, and Byzantium,[113] whilst iconography confirms the association from the beginning of the sixth century BCE at the latest.[114] At the Spartan sanctuary, eighth-century ivory, terracotta, and lead figurines suggest the presence of a deity bearing the characteristics of Potnia,[115] but given the uncertainty of the link between Artemis and Orthia at such an early date, it is perhaps safer to assume that the two goddesses were independent when the *Partheneion* was composed. It should be noted, however, that Orthia was associated with attributes shared also with Artemis. The *Partheneion* involves a nocturnal dance performance by pubescent maidens, and Artemis is the paramount deity propitiated by young maidens entering puberty in the Archaic Greek polis.[116] Additionally, nocturnal female dances seem to have been customary at the Artemis Orthia sanctuary during the festival called 'Procession of the Girls'.

Artemis, an eternal maiden herself, is the goddess of pubescent girls par excellence. Her link with night-time ceremonies performed by young maidens is attested in Sappho, who mentions maidens standing around an altar by moonlight.[117] In another example, Alpheus attempted to rape Artemis in Elis during a night-long *pannychis*, performed by the goddess and her maidens.[118] The resonance of this reference with the *Partheneion* is evident. Another important and early element of Artemis cults across ancient Greece is dancing. The earliest reference is taken to be the Homeric mention of the abduction of Polymela by Hermes as she danced in honour of the goddess.[119] Finally, the association of Artemis as the goddess of the *Partheneion* is also supported by Kallimachos' reference to the Pleiades as daughters of the Queen of the Amazons and as being the first to establish dancing and night-long festivals for maidens.[120] On the other hand, the deity of the *Partheneion* was associated with light, an attribute shared also with Artemis from the Archaic period. Kallimachos relates the story of Zeus granting the goddess the privilege to be the 'Bringer of Light' (Phaesphoria).[121] We will see that this attribute was prominent in her Messenaean cult, where she was evoked as Artemis Orthia Phosphoros (Bringer of Light),[122] and in Euboea, where Artemis was addressed as 'She Who Faces the Sun' (Prosioas).[123]

Both Artemis and Orthia were associated with pubescent girls, dancing, dawn, and light.[124] At the sanctuary of Artemis Orthia in Messene, part of the performances of the young female initiates took place around the altar. In both Sparta and Messene, the *xoanon* of the goddess was carried in a procession,[125] and the *Partheneion* robe (*pharos*, line 61) was a dress, which we encounter also in the images of the Messenian cult statue.[126] Female dancing was also performed at Messene and Sparta. Pottery unearthed at the Spartan sanctuary

showing dancing boys and girls agrees with Plutarch's reference to Helen (a maiden of Artemis) dancing at the sanctuary at Orthia when she was carried off by Theseus,[127] a comparable reference to the dancing mentioned in Messenian inscriptions.[128] Furthermore, the dancing performed by the maidens of Artemis and Orthia was also an attribute ascribed to the star cluster Pleiades, often said to dance.[129]

The Spartan Artemis Eileithyia, goddess of childbirth, associated with fecundity and help with the pains of labour,[130] has also been proposed as the *Partheneion* goddess on grounds of the unspecified 'labours' (πόνων) in line 88. This seems the most convincing alternative to Artemis Orthia. Eileithyia was also linked with light: she brought children to light at birth. Written sources refer to a sanctuary of Artemis Eileithyia,[131] and although the location of the sanctuary has not been identified, a number of dedications to Eileithyia were recovered at the sanctuary of Artemis Orthia in Sparta.[132]

Other less convincing divinities have been proposed as the *Partheneion* goddess. Phoebe, the daughter of Leucippus,[133] does not seem to have had a female chorus associated with her cult. Hera's dominant attribute as the goddess of marriage does not seem to fit with a rite performed by young maidens,[134] nor is she associated with daybreak or light. The suggestion of Aphrodite relies heavily on the identification of *Aotis* with the planet Venus,[135] which ancient Greeks also called Phosphoros. The idea is appealing if we consider the comparison of the beauty of the girls in the *Partheneion*, but Venus was equally the evening star, so if we follow this correlation, Aphrodite would be as much a dusk goddess as a dawn goddess. In addition, Aphrodite does not appear to be linked with the initiation of young maidens in Sparta.[136]

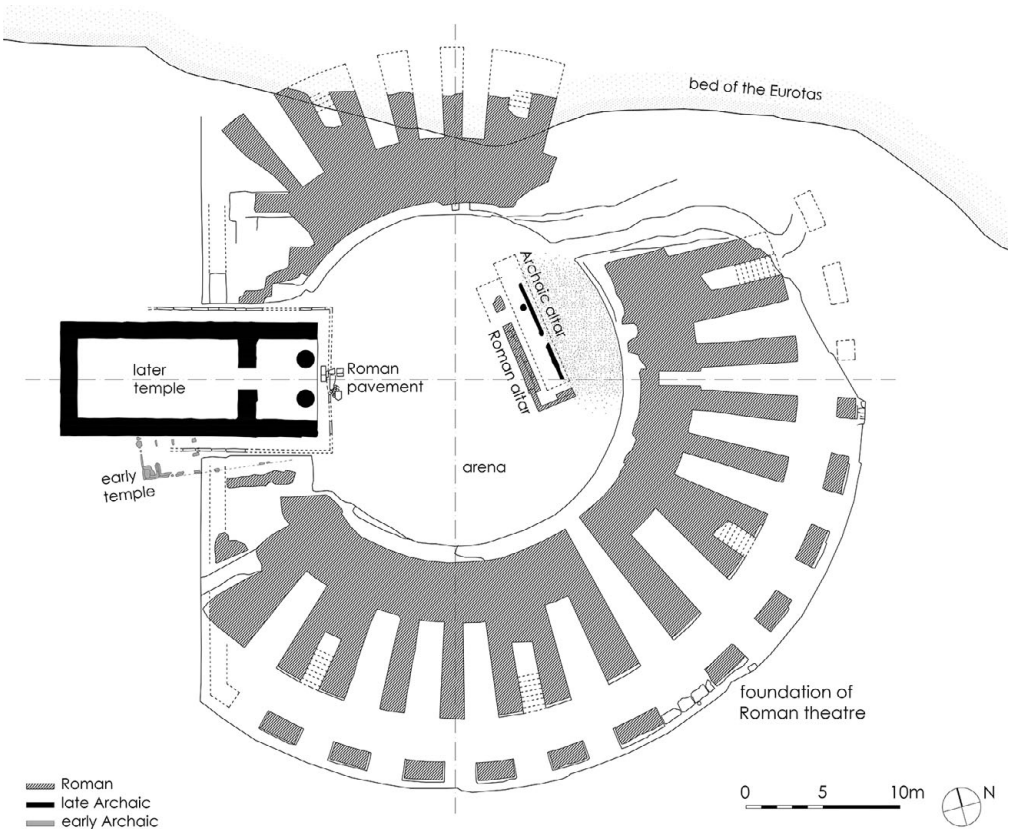
Gloria Ferrari's study, nearly alone in taking up a rigorous analysis of the role of the cosmos in the ritual and in juxtaposing the ethereal with the earthly, is without a doubt a work of merit, but some interpretations seem unsatisfactory. First, the study associates the poem with the Spartan Karneia and the cosmical setting of the Pleiades, interpreting the ritual as marking the turning of the seasons and the beginning of winter.[137] This association, as Ferrari also acknowledges, would place the festival, and consequently the *Partheneion* rite, in November. Although Apollo's attributes are fitting with a festival linked with dawn, the divinity of the poem is explicitly female. A similar difficulty exists when attempting to link the poem's ritual to those carried out during the Karneia. The *kalathiskoi* dancers who performed during the Karneia verify the role of dancing in the festival, but we lack evidence for a female ritual performance in front of the altar of a goddess associated with dawn, as described in the *Partheneion*. Two further difficulties are detected with this identification from an astronomical perspective. The

cosmical setting is observed in the western horizon, when a star sets a few minutes before the arrival of the first light of dawn. Consequently, if Ferrari's interpretation is correct, the Pleiades were seen to set, not rise, as the poem specifies. Furthermore, the Karneia was held in the Spartan month Karnos (Attic Metageitnion, August–September), approximately two months before the cosmical setting of the star cluster (in early November), rendering Ferrari's interpretation unattainable. The precise date of the festival in the month is not known, but based on ancient references, Spartan festivals were held near the full moon.[138] This evidence, in conjunction with the festival lasting for nine days, could position it approximately between the fifth and seventeenth of the month, ending near the time of the full moon.[139] This translates to late August through early September. Ferrari's argument could instead link the ritual with the acronychal rising of the Pleiades rather than their cosmical setting, but even in this case, the occurrences do not seem to match. The acronychal rising occurs too late in the month (around 25 September) and would fall either at the very end of the Spartan Karnos, in the years the month started late, or, more commonly, at the beginning of the following month. Even if we were prepared to ignore this short lapse in time, the astronomical phase does not match the description we are given in the *Partheneion*. The acronychal rising occurs after sunset, a timing thoroughly incompatible with the poem's explicit references to the Lady of the Dawn and to the sun being summoned to rise.

The Sanctuary and Astronomy of Artemis Orthia in Sparta

The Geometric altar (ca. 950–850 BCE), the earliest extant remains of the sanctuary of Artemis Orthia, may have replaced an earlier earthen altar in the same area.[140] The location and orientation of all four consecutive altars remained unchanged during the more than six centuries of the site's lifespan (Archaic, sixth century BCE; Classical, ca. 450 BCE; and Roman, 250 CE) (Figures 39 and 40).[141]

The earliest of the two Archaic temples dates to the beginning of the seventh century BCE and was replaced in the beginning of the sixth century with a somewhat different orientation (Figure 39),[142] slightly farther south of east, but this orientation remained unaltered when the temple was rebuilt again in the Hellenistic period (second century BCE). The temple and altar were encircled by the Roman theatre a century before the sanctuary of Orthia was abandoned.[143] Ritual performance had shifted by that time to the controversial male *ephebic* cheese-stealing ceremony and other rituals with a militaristic focus, which had started a few centuries earlier,[144] but the theatre gives a good indication of the size of the congregations at the site. The ritual space was structured to enable the observation of rites performed at the altar and temple



39. Ground plan of sanctuary of Artemis Orthia in Sparta showing the two temples and consecutive altar phases (adapted after Dawkins 1929 by Socratis Tsacos)

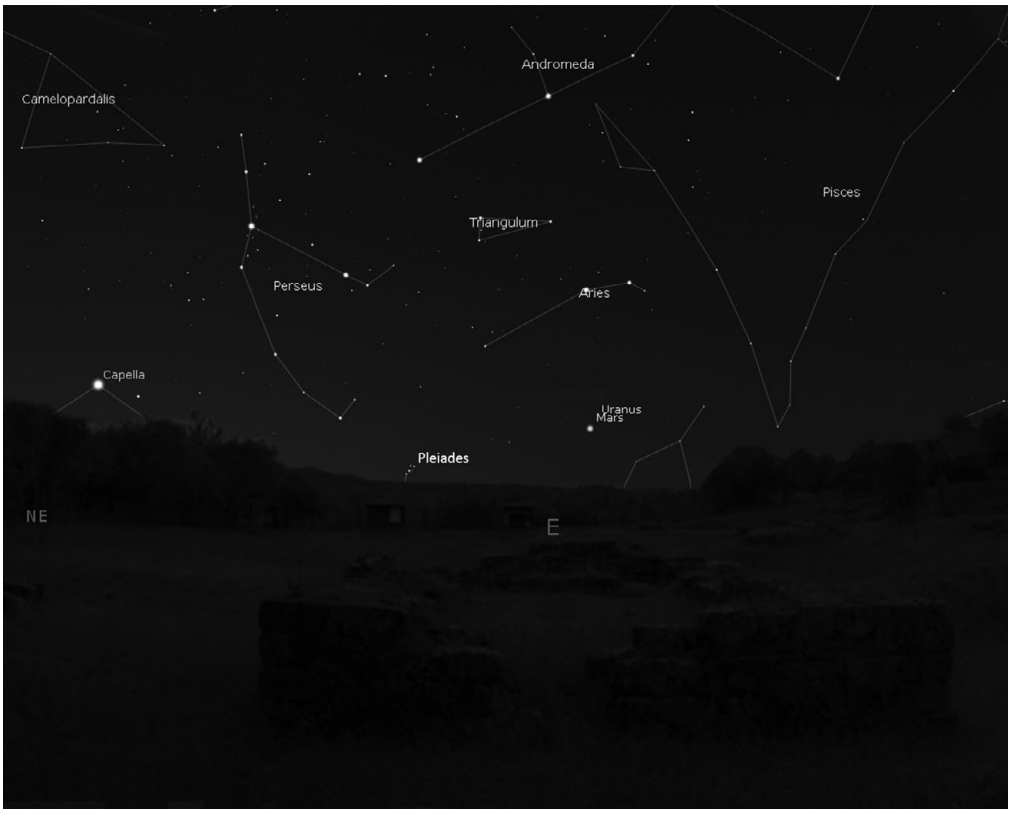
40. Remains of the temple, altars, and horizon of Artemis Orthia, Sparta from south (photo by E. Boutsikas)

TABLE 5.3. *Summary of declinations of the discussed astronomical targets and the sun. The declination range given for the stars and constellations accounts for their shift due to axial precession during these six centuries. This shift was invisible to the naked eye.*

	Date	Declination
Pleiades	800–150 BCE	$+12^\circ$ to $+15^\circ$
Orion's Belt	800–150 BCE	-6° to -8° and -4° to -6°
Sirius	800–150 BCE	-17° to -16°
Sun	18–20 May (at heliacal rising of Pleiades)	ca. $+18^\circ$
	9 July (at heliacal rising of Orion's Belt)	ca.$+23^\circ$
	2 August (at heliacal rising of Sirius)	ca.$+20^\circ$

entrance. The layout of the theatre places the temple *pronaos* in the space usually occupied by the theatre's stage and the altar is positioned in the *orchestra* (Figure 39). The sole function of the theatre appears to have been the hosting of spectators during the religious performances centred at or around the altar in front of the temple.[145] These performances were always framed by the backdrop of the temple's entrance and the surrounding land- and skyscape, structuring space in an exceptional way.

Let us follow Alkman's invitation and turn our sight to the night sky. The earlier temple of Orthia was oriented almost due east, at azimuth ca. 92°, and the extant temple at azimuth 100°. The declinations of the two temples show a shift in orientation from declination -1° (seventh century) to -6° (sixth century). This change cannot be associated with the precessional shift of the Pleiades (Table 5.3); instead, it seems to have arisen from necessity, following the first temple's destruction by the flood of the Eurotas River.[146] The orientation of the Artemis Orthia temples is closer to Orion's belt than to the Pleiades (Table 5.3).[147] In ancient Greece, the first sighting of the Pleiades just before dawn took place above the eastern horizon around 20 May, after the constellation's annual forty-day period of invisibility (Figure 41).[148] The orientation of the temples cannot be associated with the position of the rising sun. At the time of the Pleiades' heliacal rising, the sun rises farther to the north, at declination ca. $+19^\circ$ (Table 5.3). It is interesting that the consecutive altars of Artemis Orthia have exactly the same orientation, which is, however, different to the orientation of both temples. The altars are centred around declination $+13^\circ$ (azimuth 76°), within two degrees from the rising position of the Pleiades (declination $+12^\circ$ to $+15$ between 800 and 150 BCE, respectively).[149] On the basis of this evidence, in the Geometric, Archaic, and Classical periods, this viewing and therefore also the 'Procession of the Girls' took place on a date corresponding to around 20 May. The use of the word *orthriai* in the poem could provide further support to link the observation with the festival if we



41. Reconstruction of the Spartan night sky during the heliacal rising of the Pleiades as seen by Alkman and the participants of the *Partheneion* rite and for at least three centuries later (with changes invisible to the naked eye). For colour version, see the plate section.

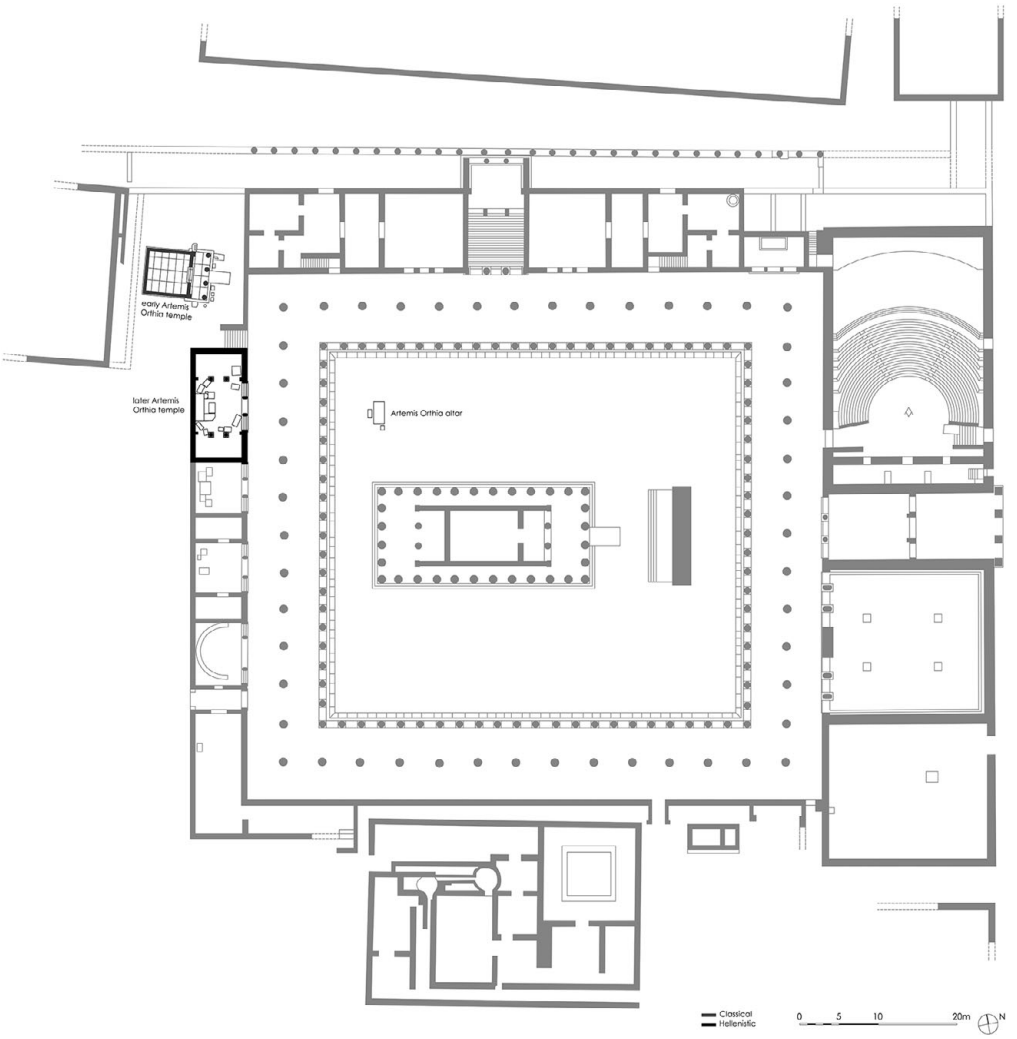
consider Hesiod's reference to the star cluster's heliacal rising, which uses the same word to denote dawn.[150] Burnett's suggestion that the poem indicates the time when both the Pleiades and Sirius rise before dawn does not hold: as we saw, the two heliacal risings occur two and a half months apart. If we assume that Sirius was also visible in the sky at the time of the ritual on the premise that it is also mentioned in the poem (i.e., accepting the alternative translation of lines 60–3, Sirius rising with the Pleiades), the performance would have to take place around 4 August, when Sirius first appears in the night sky before dawn. This time marks Sirius' heliacal rising, but the Pleiades rise during the night (approximately three hours after sunset). As the night ends, in the few minutes before the first light of dawn, Sirius is seen to climb above the horizon, seemingly following the Pleiades, which by then, still gaining altitude in the sky, are much higher (at an altitude of around 60°) compared to Sirius' altitude of 4°–5°. It should be noted, though, that this reconstruction does not agree with Alkman's reference to the rising Pleiades before dawn.

The discussed literary, archaeological, and astronomical evidence assist in the following reconstruction: the 'Procession of the Girls', probably identical to the *Partheneion* rite, involved groups of young girls performing an open-air nocturnal ritual to honour their goddess Orthia. An hour before dawn, the rite culminated at the altar, as the girls brought the offering of a robe to the goddess. At least during these final moments of the performance, the maidens of Orthia would face the rising of the seven virgins star cluster (Pleiades),[151] during a verbal and physical interplay of light and darkness, when the girl called Agido summoned the sun to rise. The entire female initiatory performance, honouring the 'Goddess of Dawn', evoked the cosmos to witness the transition of the participating maidens to adulthood.

The suggested connection between astronomical observance and ritual in this event is not the only such occurrence in Spartan culture. Astronomy seems to have permeated religious and civic life in Sparta. We discussed in Chapter 1 the use of celestial observations in the astronomical element of the *enneateric* renewal of the Spartan king's tenure. The importance of heavenly occurrences linked to the well-being of the Spartan state and guiding earthly procedures and events in Spartan culture is also witnessed in the importance of the constellation of Gemini, the celestial configuration of the divine twins Kastor and Polydeukes. They were not simply thought of as kinsmen of the Spartan kings, but were believed to have been actively guiding the Spartans, in addition to being represented in the symbol of the *dokana*, which accompanied the kings in battle. The celestial twins were the 'guiding stars of the Spartan arms, who disappeared before the defeat of Leuktra', and who appeared in the sky upon Lysander's victory at Aegospotami.[152]

Ritual Performance at the Sanctuary of Artemis Orthia in Messene

The Hellenistic Asklepieion of Messene incorporates the only extant temples of Artemis Orthia outside Sparta. The cult of Orthia here predates Asklepeios, with the early, small *prostyle* temple of Artemis Orthia dating to the same time as the foundation of the city, in the fourth century BCE.[153] With the Hellenistic construction of the sanctuary of Asklepeios, the cult of Orthia was transferred a few metres to the south, to the newly built cult room conventionally called *Oikos K*. This space is the only room of the Hellenistic complex surrounding the Great Temple of Asklepeios to be securely identified as a temple,[154] and it was associated with the altar located inside the temple of Asklepeios' enclosure, with which it shares the same orientation (Figure 42).[155] Finds from the earlier *prostyle* temple located to the north of the Asklepieion suggest the worship of a *kourotrophic* deity (Eileithyia



42. Ground plan of the Hellenistic Asklepieion and the *prostyle* Classical temple of Artemis (adapted after Themelis 2003 by Socratis Tsacos)

or Artemis) (Figures 42 and 43).[156] Seventh-century BCE votives and terra-cotta plaques (a century after the Spartan conquest of the city) from the building behind the prostyle temple, also suggest the worship of a *kourotrophic* deity with an unclear identity (tentatively identified with Demeter).[157] It is uncertain whether there was continuity from the seventh century to the fourth;[158] the worship of Artemis Orthia displays continuity at least from the fourth century.[159] The decision to maintain the presence of Artemis Orthia in one of the city's most important sanctuaries, which was also the centre of Messenian religious life, attests to the importance of this cult in Messene; the size of *Oikos K*, which was the largest in the complex, also supports this

43. The Classical *prostyle* temple of Artemis Orthia in Messene from west and its eastern horizon. *Oikos K* (temple of Artemis Orthia) is located under the shelter to the right. (Photo by E. Boutsikas)

idea.[160] The Messenian cult of Artemis Orthia, associated with the participation of pubescent girls dressed in long ceremonial robes (*chitons*), is thought to have declined around 150 BCE.[161]

Two concurrent cult statues have been unearthed at Messene, one with a fixed position within the temple and another, a smaller and moveable image of the goddess, placed nearby.[162] The latter was the image that sources describe being carried during the festival of the goddess,[163] but it is believed that the cult addressed both images.[164] Aside from carrying the cult statue outside the temple (as was also the case in the Spartan sanctuary), the rites included dramatic performances, nocturnal torch races, and igniting fire at the altar with torches.[165] In figurines and her cult statue, the Messenian Orthia was depicted in a huntress outfit, wearing a short *chiton*, and was associated with other familiar aspects of Artemis, such as her role as protector of pregnancy and childhood.[166] As we saw earlier, both here and in Sparta, written and iconographic evidence associate her with the appearance of light. Both cult statues of Artemis in Messene depicted the goddess holding a torch,[167] while Pausanias mentions three cults of Artemis in Messene and calls the Artemis of the Asklepieion Artemis Phosphoros (Bringer of Light).[168] Archaeological finds confirm this assertion. The statue base naming Artemis Phosphoros and Orthia was found in situ in *Oikos K*,[169] and in conjunction with other epigraphic and archaeological finds, the goddess is securely linked with three epithets in her Hellenistic temple: Phosphoros,

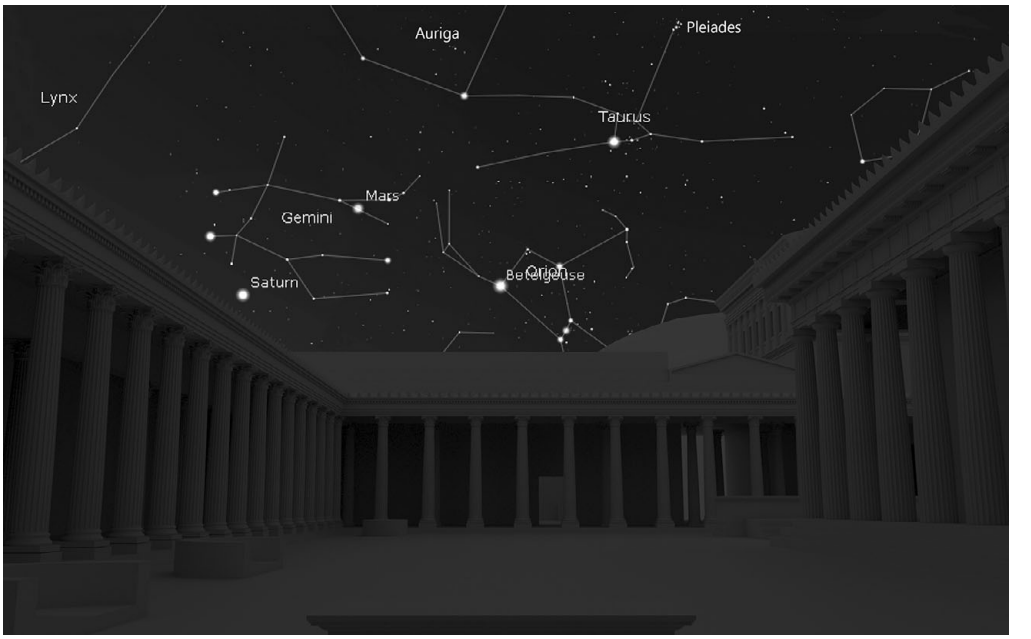
TABLE 5.4. *Orientations of the structures dedicated to Artemis Orthia in Sparta and Messene*

Location	Structure	Azimuth	Declination
Sparta	Archaic Temple (early ca. 7 BCE)	ca. 92°	ca. −1°
	Second Archaic Temple (early ca. 6 BCE)	100°	−6°
	Altars (Geometric–Roman)	76°	+13°
Messene	*Prostyle* Temple (ca. 4 BCE)	129°	−22°
	Oikos K (215 BCE)	115°	−12°
	Altar	115°	−12°

Orthia, and Oupesia.[170] The Messenian goddess would be then more accurately referred to as Artemis Phosphoros-Orthia.[171]

The orientations of the temples and altars of the goddess in the two cities differ by a few degrees (Table 5.4). As was the case with the Spartan temples, the Messenian temples are oriented closer to Sirius and Orion's belt than to the Pleiades (Tables 5.3 and 5.4). But the Messenian altar, unlike the Spartan, followed the orientation of the Hellenistic temple of Artemis. The positioning of the altar of Artemis Orthia in Messene allowed performances to enjoy the freedom of open space, allowing a glimpse of the distant horizon rising behind the double-aisled *stoa* (Figures 44 and 45). The timing of the Messenian Artemis Orthia festival is not known, but if the Messenian attempt at a separation from Lakonian customs was sufficiently organised as to reconstruct the history of the cult after their liberation, it would not be surprising if the shift in orientation was associated with the Artemis Orthia rites being held at a different time in the year – at the time of Orion's (or perhaps even Sirius') heliacal rising, as opposed to the Spartan focus on the Pleiades. As Heather Loube has more recently remarked, such a choice would be more fitting, given the hunter's link with Asklepios and Artemis, but also being 'born in Boeotia, the homeland of Messenia's liberators', where there is some indication of his worship as a hero.[172]

The Messenian adoption of the Artemis Orthia cult is seen as 'a remnant of the time when Messenia was a part of *Lakonike*'.[173] Messene was conquered by Sparta in the eighth century BCE. Approximately fifty years later, in the mid-seventh century, the Messenian revolt led to a war which ended with Spartan victory and a further status reduction for the Messenians to *helots*.[174] As Nino Luraghi demonstrates, the Messenians creatively reconstructed the history of the cult after gaining their freedom, but despite their attempt to emphasise their differentiation from Spartan culture, they retained Lakedaimonian elements in their post-liberation pantheon and cults.[175] They claimed that their cult of Artemis Orthia dated to the same time as the cult's introduction to Sparta, if not earlier, at the time of the Dorian invasion.[176] The attempt at cultural differentiation from Sparta asserts the aim



44. Reconstruction of the rising of Orion as visible from the altar of Artemis Orthia in the Messenian Asklepieion. For the position of Sirius following Orion refer to Figure 38. For colour version, see the plate section. (by Lloyd Bosworth and Efrosyni Boutsikas)

45. Reconstruction of the Messenian Asklepieion from the north-west corner, showing the altar of Artemis Orthia and the horizon visible behind the enclosure. For colour version, see the plate section. (by Lloyd Bosworth)

to enforce a separate identity, a division between the *Spartiates* on one hand and *helots* and *perioikoi* on the other,[177] but it is difficult to verify archaeologically. The cults and language of the Messenians are not easily distinguishable from those documented in Lakonia and there does not seem to have been a unified region that could be named Messenia (at least prior to the Spartan conquest).[178] Even for ancient authors, Messenian identity was a matter of debate. Pausanias argues in favour of the Messenians having maintained their identity and Doric dialect over several centuries despite the catastrophes they suffered,[179] but Thucydides made no distinction between Messenian and Lakedaimonian dialects (*homophonoi*).[180] It appears that Messenian identity originated in early settlements dating prior to the Spartan expansion, which acquired the status of *perioikic* communities after the expansion of Sparta.[181] These areas of early occupation became central in the later periods, when the *perioikoi* attempted to solidify their newly found identity and the area of the later Asklepieion was the centre of fifth-century BCE resistance against Sparta.[182] The emergence of a separate Messenian identity must have occurred during the first revolt against Sparta, after the earthquake (sometime around 469 BCE), and was established by the second revolt and liberation of Messenia by Epameinondas. It is possible that the need for this Messenian identity 'emerged out of the aspiration to autonomy and independence of some *perioikoi* who lived quite far from the centre of the Spartan state'.[183] Reconstructions of these events assert the formation of Messenian identity as the result of the revolutions rather than their cause. An independent identity was necessary in enabling Messenians to differentiate themselves from the Spartans they were fighting against, despite this identity formation being a process which lasted for centuries.

An example of this Messenian identity reinvention process has been argued for the mythological tradition presented in *Kresphontes*, which – although seeming to have been invented by Euripides – was nevertheless adopted by the Messenians in their attempt to connect the myth with the recent federal state of Arkadia, at the time looking for 'a recognisable past'.[184] The figure of Kresphontes, who was transformed from a Spartan myth to a Messenian hero, was part of the forging of the new Messenian identity and cultural memory, since the identity and mythological past of Messene prior to Spartan domination had been lost. Naturally, Messenian religion was also targeted during this reinvention process, which involved the forging of Messenian identity and cults as separate to those of Sparta, despite the fact that Messenian cults (at least from the fourth century BCE) were typically Spartan. These Messenian constructs, which took place after the end of the Spartan occupation, were the result of the Messenian desire to cut away from Sparta. The important role that the cult of Artemis Orthia/Phosphoros continued to play in Messenian

identity, despite being a Spartan cult, shows that the conscious attempt to abolish everything that could link the newly found identity with Sparta was relatively superficial.[185] It is possible that the Messenian agenda of separation from Sparta was partly responsible for the addition of the prominent Phosphoros attributes to Artemis Orthia and the attribution of the 'holy elders, descendants of Kresphontes',[186] an attempt to link the cult to the Dorian migration. This made the Messenian cult at least as ancient as the Spartan. This deliberate differentiation of the Artemis Orthia cult is, however, puzzling when contrasted to the well-attested Lakonian influence observed in other Messenian cults, such as those of Apollo Korythos, Artemis Limnatis, and Poseidon at Akovitika.[187] In short, cult evidence from pre-revolution Messenia (sixth and fifth centuries) is consistently Lakonian or, at the very least, Lakonising, with deities worshipped being the same as those in Sparta.[188]

We saw earlier that Orion's katasterism associates him and his dog, Sirius, with the Pleiades. The *Partheneion* comparison of Sirius and the Pleiades (lines 60–3) has been the subject of much uncertainty.[189] The long-standing debate about the real meaning of the comparison, which does not seem to make sense from a literary perspective, has, after several decades, failed to produce a conclusive interpretation. The idea put forward by Ann Burnett that what lies at the heart of this comparison is not really a comparison, but rather a temporal marker of the timing of the poem, has not received much attention.[190] This argument is based on the very similar functions of Sirius and the Pleiades as important heralds in the farmer's year, which we know with certainty that the Greeks used at least from the time of Hesiod.[191] But Spartan society was not a farming society; Sparta's economy depended on the *perioikoi* and the *helots*, the communities providing Sparta with necessary agricultural products. Sirius and the Pleiades are among the most easily identifiable stellar targets of the night sky. Their movement was used not only in farming; they equally functioned as markers of the changing seasons and in navigation. In the *Partheneion*, the chorus is in a contest with the Pleiades and Sirius. Perhaps it is a time contest: the girls have to finish their tasks before sunrise.[192] The heliacal rising of the Pleiades in May occurs during a very busy time in the farmer's year, lasting until the middle of July (harvest, threshing, winnowing), followed by the heliacal rising of Sirius, the brightest star in the sky, which heralds the beginning of the farmer's rest period.[193] Although the spring and early summer would not be as busy in the military Spartan society, this was not the case for Messene, which was supplying Sparta with agricultural products. If the *Partheneion* places the timing of the festival of Artemis Orthia in late May at the heliacal rising of the Pleiades, this results in a festival celebrated during the busiest time for the Messenian agricultural year (along with other *helot* communities). A hypothesis based on the assumption that the religious structures did indeed link their orientations to the specific astronomical observations

mentioned in the *Partheneion* could be that the festival of Artemis Orthia in Messene either took place later in the year than the Spartan festival (i.e., in July–August, during the heliacal rising of Sirius or Orion), or that both cities celebrated the festival around 4 August, when Sirius rises heliacally and signals the end of the farmer's year: a time when the Pleiades, Orion, and Sirius are all present in the night sky.

In Messene, the newly composed identity was manifested and promoted in the construction of the Asklepieion, which became the centre of Messenian cult activity from the Hellenistic period. The new Messenian identity engulfed all those cults considered important, having citations or anchors in the past,[194] but at the same time renegotiated and articulated the independent city's new religious identity. Citations, although containing reference points for already-known and accepted ideas, have also the ability to redefine and rearticulate concepts in order to create new ideas. The cult of Artemis Orthia was sustained while other cults, associated with parts of Messenia outside the city of Messene itself, were excluded.[195] New concepts and identities were forged through references to the past, using ritual performance as the medium.

DISCUSSION: MEMORY, REMEMBRANCE, AND IDENTITY

In Chapter 2 we discussed that advances in the study of memory resist the treatment of the mind as an isolated, autonomously functioning entity, for such a treatment leads to important omissions in our understanding of memory's relationship to material culture and performance. It is instead more successful, following the example of cognitive science, if we treat memory as a tool which presides over the formation of ideas, knowledge, and perceptions,[196] but also as a tool which determines what should be remembered and what forgotten. Such an approach enables the study of the relationship between mind, body, and world. Recent advances in cognitive psychology and philosophy of mind have contributed to our understanding of how the duality of brain-mind deals with memories and remembering, and the extent to which memories affect cognition and remembrance of events. Since the mind's ability does not end at the boundaries of skull and skin,[197] props (individual or collective extra-neural resources) and specific conditions act as an extension of the mind because they stimulate it and facilitate memories and remembering: the so-called extended mind.[198] It follows that these props are part of embodied engagement and assist in shaping knowledge and memories. As we explored in Chapter 2, embodied memory is closely connected to ritual performance, which conveys and sustains memories of the past. Along with props, space and place have an equally significant role in this process through the ability of space to contain meanings and memories.[199]

In the context of ancient Greek rituals performed around an altar it is not difficult to see, as Joannis Mylonopoulos has previously argued, that these performances impacted on viewers' visual experience of known myths through mimetic performance and the manipulation of space.[200] Mylonopoulos exemplifies the correspondence of the spatial layout of sanctuaries with the performances and the intended experiential aims of specific cults (e.g., the Corinthian sanctuary of Demeter and Kore, or the sanctuary of Despoina in Lykosoura). His analysis demonstrates that a study of spectator movement patterns and the spaces where they gathered is imperative to our understanding of ancient ritual experience. At the sanctuary of Artemis Orthia in Sparta, the Roman theatre constructed around the altar is a distinct example of such spatial development. Its layout forced spectators to focus their sight on the altar and made attendance more formalised. The same space was experienced much differently in the earlier centuries prior to this construction, when the open space and free movement around the altar allowed spectators to witness the performance of the ritual offering to the goddess at the altar, as well as to visually observe the dialogue with the cosmos in which the performers engaged. In addition, the pre-Roman experience of the performance must have involved collective remembering and 'interactive cross-cueing' as seen in the recitation of the dialogue between the chorus, Hagesichora, and Agido in the *Partheneion*. The combination of all these elements shaped a different experience to that of the Roman period: it was an experience involving the ritual performance and the visible participation of the cosmos as witnessed in the rising of the celestial bodies. The construction of this cognitive environment retrieved and shaped memories of the ritual's cosmic dimension.

In Athens, a similar mechanism was employed. The experience of the specific place, architecture, and sculpture triggered sentiments of identity. The Panathenaic dedication of Athena's *peplos* and the visitor's spatial movement on the Acropolis at the time of Draco's most significant occurrence had clear references to serpentine creatures: the half-snake figures in the pediments of the Older Parthenon, the snake next to Athena's shield on her gold and ivory statue, the crypt under the Erechtheion's floor where the sacred snake dwelled, the scenes of the Gigantomachy woven on the *peplos*. Athena, who above all deities 'brings *drakontes* to fight with *drakontes*',[201] is eminently present in all of these 'citations'. The citations interacted with the visitors as their route on the Acropolis unravelled, (re)shaping Athenian identity through the renegotiation of memories of the mythical past. Upon arriving at the Erechtheion's east and north porches, these 'mental props' awakened context-specific memories, blending with the viewing of Draco in an upright position in the north horizon. The celestial representation of the Giant killed by Athena was also associated with another snake of cosmogonic significance, Ophioneus (or Ophion, Serpent) and his role in the establishment of cosmic

order. In Pherekydes, Ophioneus hatched the Orphic Egg from which sprang the cosmos. He ruled the heavens with his consort Eurynome until Kronos (or Khronos)[202] challenged and defeated him.[203] From a reference in Euripides, it seems that Draco was associated with cosmic time by the fifth century BCE,[204] and cosmic time is present in one more detail of the Gigantomachy myth. Athena launches into the battle as soon as she is born out of Zeus' head; the battle of the Giants marks also the time of Athena's birth. The *Homeric Hymn to Athena* informs us that Helios paused time as soon as Athena appeared out of Zeus' head, so that she could take her armour from her shoulders and so that Zeus could rejoice in her birth.[205] So time is of significance during the episode, and as has been discussed elsewhere, cosmic time is also depicted in the scene of Athena's birth on the Parthenon's east pediment, where Helios rises above the waters of Okeanos – another figure of cosmogonic significance – in his chariot in the south-east corner. On the opposite corner, Selene has almost sunk below the virtual horizon of the pediment in her chariot, the heads of her horses with their open mouths and protruding nostrils gasping for one last breath before they sink completely in the space below.[206] The composition creates a balanced centre of an eternally rotating cosmos, as the two contrasting heavenly siblings gravitate to either corner.[207]

The links take us back to the discussion of John Sutton and Richard Gregory's context-dependent reconstruction of place (Chapter 2). The Panathenaia, through iconography, performance, and the total environment, created a cognitive ecology, which activated social memory in order to enforce Athenian identity. The Athenians identified an ingenious way to forge a collective identity through the myth of Erechtheus/Erichthonios and its political and ethnic significance. It contained both a bonding element of cohesion within Athens as well as a tool for differentiating Athenians from other groups.[208] Similarly, the recitation of mythical narratives during ritual re-enactment at the Arrephoria made use of embodied memory and interactive cross-cueing so as to legitimate authority.[209] Cosmic order was witnessed in the participation of the cosmos in all Athenian rituals explored in this chapter, in turn legitimating current social order. In this way, the participants' social memory supported Athenian identity, both at an individual and at a community level.[210] An interesting idea in relation to this context-specific reconstruction and interactive cross-cueing is the one put forward by Christoph Clairmont, who argued that the almost concurrent date of the Classical Erechtheion's construction and Euripides' tragedy *Erechtheus* could not have been coincidental. His suggestion that the tragedy was inspired by the construction of the Erechtheion reflects the power that these narratives had in Athenian cultural memory.[211] Furthermore, Joan Connelly's renewed argument on the Parthenon as the place dedicated to the group of sacrificed Athenian maidens (the *opisthodomos* in particular)[212] reinforces the idea of a

context-dependent reconstruction and a built environment which functions as a repository of conscious and unconscious collective memories through the cognitive blending of myth, space, and the cosmos during performances.

The spatial layouts of ritual performances in Athens, Sparta, and Messene show deliberate choices of location, aiming to best express memories of strong ethnic identity and important cosmologic ideas. The rituals were integrated within the movement of the cosmos. We saw at the beginning of the chapter that the Erechtheion incorporated Helladic traces of ritual activity, which, although insufficient to demonstrate continuity, may denote a deliberate attempt to link ritual practice with the past as a means of reinforcing Athenian beliefs of autochthony. The traces of Poseidon's trident, or Zeus' thunderbolt left exposed but incorporated within the Classical Erechtheion, created a mnemonic emergence of links with visible ancestral remains. Maintaining the tradition of a cult asserted respect to the gods and ancestors who were in control of the current order. This belief may have been partly anchored in the power of the dead and particularly in the power of heroes (like Erechtheus), but respect was also linked to the maintenance of cosmic balance. Society in Athens was also propagated through the respect shown to the family of the Eteoboutadai, who traced their ancestry back to Erechtheus, Boutes, and Pandion. Cosmic balance was renewed annually through the correct performance of rituals and, as suggested here, this was tied to Draco's culmination and the heliacal rising of the Hyades during the Panathenaia and Arrephoria, respectively. In the case of Sparta and probably Messene also, cosmic order was assured in the rising of the Pleiades, Orion, and perhaps Sirius just before the leader of the female chorus summoned the sun to rise. Ferrari's remark on the double identity of the chorus, which embodies a cosmic harmony (through references to the star cluster's cosmic dance) and state harmony (through the social order enacted by the choral performance), is an attractive interpretation.[213] It links the ritual *dromena* and Spartan state welfare and order. We observed other such examples of linking astronomical occurrences to significant events for the state in the *enneateric* consultation of the stars for the renewal of the Spartan king's tenure and in the guidance offered by the celestial Dioskouroi to Spartan warfare.

The dynamics of ancient Greek religious spaces and the religious experience of the Panathenaia, Arrephoria, and Artemis Orthia rites created feelings of nationalisation. Manifesting the tripartite division of the cosmos, they emphasised the unique identity of space and the unique events linking those spaces with the divine sphere. By making past time present, these rituals enabled participants to (re)establish their place in humanity and the cosmos. Memorability has much to do with identity. The close relationship of memory with identity in these examples allows us to view memory as a social artefact. Through the selected examples, this chapter has considered ways in which

memories become accessible and the factors which influence the formation and accessing of memories. It is argued that participation in these festivals entailed the integration of the entirety of the human body into the process of memory formation, which enabled individual and group understanding of their place and role in the cosmos. The examples presented here are by no means exhaustive of these mechanisms. We will revisit these ideas in the final chapter.

SIX

COSMIC TIME IN GREEK MYSTERY CULTS

The past forty years in particular have witnessed a vast amount of investigations into decoding the aims and procedures of ancient Greek mystery cults. More recently, a number of rigorous and insightful studies have dealt with issues of definitions and reconstructions of the mystic proceedings.[1] However, mystery cults, given their strong cosmological focus and predominantly nocturnal elements,[2] call for investigations that take into account the context of the season, time, and skyscape in which they were performed. Because the ancient night sky is a piece of evidence more directly accessible than many other aspects of symbolic language and associations, such a study has the potential to illuminate and enrich our understanding of cult rites of which very little is otherwise known. Thus, this chapter aims to complement earlier studies by providing the crucial temporal context of three mystery cults: Eleusis, Lykosoura, and Samothrace. To achieve this, it is essential to know the month, or at least the season, when initiation was performed. As a result, we are limited in our analysis. The case of the mysteries of Despoina in Lykosoura, for instance, the timing of which is not known, demonstrates these limitations when compared to the better-documented Eleusinian Mysteries.

A discussion on what constitutes mystery cults and definitions such as 'mystic' or 'mystery' is redundant here since thorough studies on these topics are available. Ugo Bianchi's overall definition of 'mystic' in the context of ancient Greek cults, for example, remains perhaps the best formulated.[3] Part of the appeal of mystery cults was in forging an intimate relationship with a

divinity through the performance of structured activities, which articulated initiation. This special relationship conveyed the cosmological impact of initiation and introduced initiates to a select group eligible for exclusive benefits.[4] The idea of creating a special relationship with the divine through participation and experience in the mysteries requires little elaboration; it has been set out in detail elsewhere.[5] The most apparent manifestations of this sought-after relationship were tokens such as the magnetised ring and purple sash given to the Samothracian initiates, which identified the members of the exclusive group and were worn long after their initiation. These members may have had nothing else in common culturally, socially, or even linguistically, yet they were connected through a shared understanding of the cosmic structure, as conveyed in the mystery revelations. As in the case of other rituals, ancient mystery experience was shaped not only through performance and attendance, but also amidst an entire nexus which engaged cognition on a subconscious level: 'the calendrical order, the spatial organization, gender, social groups and relations, systems of classification, psychological and emotional aspects, power aspects, the place of divinities, local peculiarities, the internal logic, and commentaries of participants' is an indicative list of such interacting relationships.[6]

Human experience of any kind is critically conditioned by the presence or absence of light, paramount in the shaping of perception. The veil of darkness provided by the night was not only essential in creating a mystic atmosphere during the mystery procedures, but, as will be discussed, it also formed an essential backdrop for witnessing how the entire cosmos participated in the mysteries. The initiates experienced a synchronism between mystery initiation and the cosmos. It is in darkness followed by bright light that the promise of receiving benefits bestowed by the gods could be invoked.[7]

The complications we are faced with when discussing mystery cults involve not only cult proceedings, but also, in some cases, the identities of the deities involved. The situation can be so convoluted that we may not have a clear idea about the specific deities venerated in certain mystery cults, while in other examples, several different deities were associated with one cult. This situation was also confusing for the ancients, who seem to be uncertain of the identity of some divinities associated with mysteries. Such examples include the cult of Artemis in Ephesos being linked with the Eleusinian goddesses,[8] and the Samothracian Mysteries of the Great Gods being associated with the Kabeiroi, Korybantes, Kouretes, and the Dioskouroi.[9]

Some of the aims and proceedings of the Mysteries in Lykosoura and Samothrace seem comparable to those at Eleusis.[10] At Eleusis, the performances and iconographical representations of the Mysteries (depicting deities who personify agricultural wealth) demonstrate links with Demeter's connection to agricultural fertility.[11] Similarly, in Lykosoura, the re-enactment of

Zeus' birth as part of the performances and the celebration of a divine union in Samothrace point towards an emphasis on fertility and the miracle of birth, both in nature and in the creation of a new life. Perhaps the eschatological references attested only in literature and inscriptions were the result of the belief of the miracle in the union of elements which can create life:[12] a new life, even life after death.

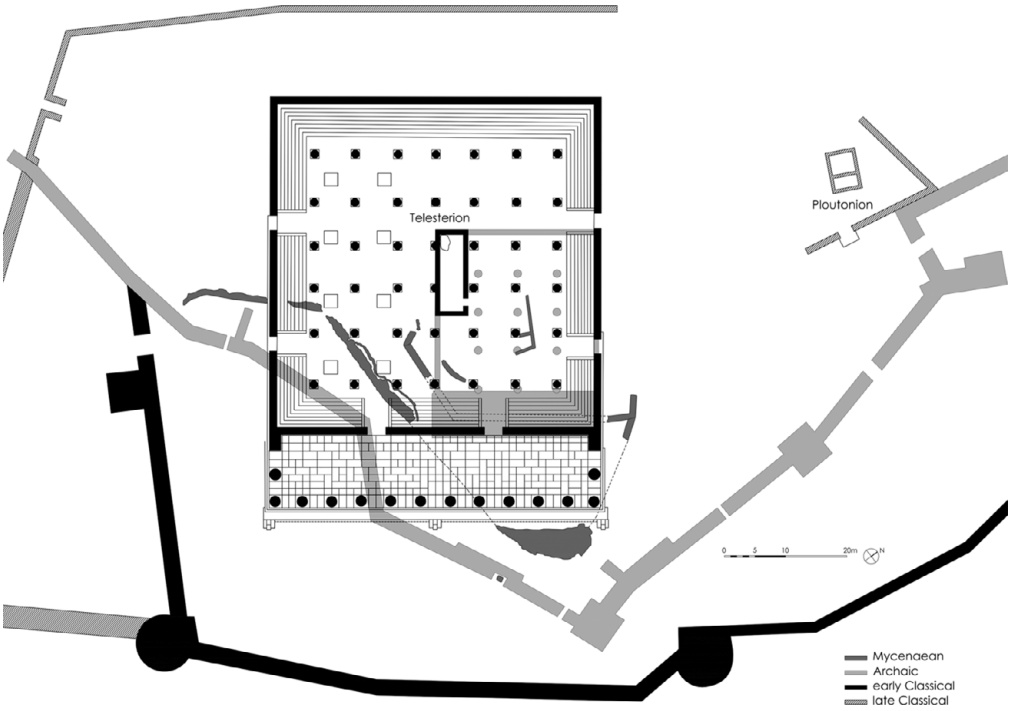
THE ROLE OF TIME IN THE ELEUSINIAN MYSTERIES

Despite the paucity of our knowledge, the Eleusinian Mysteries are the best documented of all other mystery cults and are thus given the lengthiest analysis. The combination of the late written sources with inscriptions, archaeological material, and the *Homeric Hymn to Demeter* gives us a valuable nexus. The *Homeric Hymn to Demeter* is essential to understanding the background of the mysteries, in the same manner as the *Hymn to Apollo* was essential for Apollo's cults in Chapter 4. Before embarking on a discussion on the cosmic role of the Eleusinian Mysteries, we should determine the overall temporal positioning of the Homeric Hymns in cosmological terms. The Hymns set in stone various events that led to the establishment of cults, honours due to gods, or the birth of certain gods. Thus, the cosmological timing narrated in the Hymns, in the mythical terms of the life of the cosmos, refers to the time when the gods establish their place in the cosmos. It can be fixed to after the beginning of Zeus' reign and the creation of mankind, but before the divine sphere has taken its final shape and order. This is clearly a cosmic turning point, as the cosmos has just witnessed the rearrangement of powers and alliances and the universe is now settling into a new world order. This cosmic restructuring entails a new understanding and a new experience of the universe for mankind, which – all Hymns agree – has already been created.

Topography of the Eleusinian Sanctuary

The site of Eleusis is central to this cosmic restructuring. In the *Homeric Hymn to Demeter*, architecture predates ritual; Demeter does not reveal her rites to mankind until after her temple has been built.[13] A similar formula was discussed in Chapter 4: in the *Hymn to Apollo* the god meets the Cretans who will operate his oracle after he has constructed his temple.[14] In both cases, religious architecture is by the hand of (or at least instructed by) divinity.

The Eleusinian sanctuary of Demeter and Kore, in the Saronic gulf, approximately 30 km west of Athens, was connected directly to Athens by means of the Sacred Way. A Π-shaped platform has been identified in the south-east of the Mycenaean *megaron*, which was supported by walls on all three sides and rose over 1 m high from the courtyard located in front



46. Ground plan showing Mycenaean remains, successive Telesteria, and the Ploutonion with its *peribolos* wall. All structures show a distinct south-eastern orientation. (Plan by Socratis Tsacos)

(Figure 46).[15] This open-air structure dates to LH IIB–LH IIIA1. Michael Cosmopoulos argues that it functioned as a sort of stage for the performance of ritual activities.[16] Although the *megaron* threshold leading to this platform has been shown to have a very similar orientation as, and to occupy the area incorporated in, the later Telesteria,[17] the cult rites performed in the *megaron* cannot be assumed to have been the same as the Eleusinian Mysteries, or even related.[18] The early activities seem to have involved the sacrificial burning of animals and libations, indicating the function of the platform as an altar.[19] The earliest conclusive evidence for the presence of the Eleusinian cult dates to the late eighth century BCE.[20] The Eleusinian Mysteries had already acquired a Panhellenic character by 760 BCE.

The platform of the *megaron* and of all consecutive Telesteria shared a very similar south-eastern orientation. The topography in front of these structures is very interesting. The terrace cut into the natural rock to accommodate the Telesteria is situated on sloping ground. Since the structures were placed on the slope of a hillock, the ground inclines sharply beyond the boundaries of the platform. Paired with the open area located in front of the main entrance of the Telesteria, open views to the horizon to the gulf of Eleusis were visible. The altars were probably placed on this platform from the earliest phases of

47. Photograph of the Eleusinian Telesterion, showing the NW–NE steps cut in the natural rock (photo by E. Boutsikas)

ritual activity on the site. This was also the location of the threshing floor, one of the earliest structures of the sanctuary.[21]

The Telesterion's architecture was intended to facilitate admission of large numbers of people and, as a result, does not conform to the usual Greek temple layout. It is estimated that in 408/7 BCE some 2,200 people were initiated at Eleusis.[22] The amphitheatrically constructed benches along the interior perimeter of the walls and the wooden benches which have long since perished (Figures 46 and 47) signify that, in addition to ritual performance moving indoors, a clear line of sight was essential for initiates, most likely focusing towards the area around the *anaktoron*. The importance of these large-scale initiations lies, for this study, in that the sensory experience, the altered state of consciousness, and the cosmological tenets suggested must have been accessible to and understood by a large part of the population of ancient Greece.

The Cult and the Mysteries

The uninterrupted performance of the mysteries for almost a millennium means that the earlier in date rituals are unknowable, limiting our knowledge only to the final stages of ritual development. Although it is unlikely that major

changes took place, it cannot be assumed that the rituals and performances remained unaltered during this vast lifespan. The silence of our sources does not assist in our quest to identify the development and evolution of the procedures, but we do know that the mysteries were considerably influenced by Orphic tradition at the end of the fifth century BCE, and that they had acquired allegorised meaning by Late Antiquity.[23] It is possible that the eschatological aspects of the cult were introduced in the early sixth century BCE and that it was perhaps at this time that the cult acquired its mystic character.[24] Despite these changes, it is safe to assume that the time in the year at which the mysteries were performed must have remained unchanged. Since the temporal aspect of the mysteries was then probably one of the original and unaltered elements of the cult, an analysis of the timing of the mysteries has the potential to offer important insights into the cult's cosmological tenets.

Initiation commenced with the preliminary rites of the Lesser Mysteries during Anthesterion, possibly starting on the twentieth of the month,[25] around early March. The Lesser Mysteries were probably held approximately 1 km south-west of Athens in the deme of Agrai, by the east bank of the Ilissos river, at the sanctuary of the Mother.[26] They had a purificatory character, aiming to prepare initiates for the Greater Mysteries; at the same time, they marked the return of Kore after her four months in the underworld.[27] Some secret knowledge must also have been revealed during the Lesser Mysteries; otherwise, the execution of the two Akarnanian youths who unknowingly entered the sanctuary during the Mysteries in 200 BCE would not have been necessary.[28] The Lesser and Greater Mysteries were closely linked with the agricultural cycle both in myth and in their timing. The first fruits offered during the Proerosia/Proarktouria (starting on 5 Pyanopsion) were received during the celebration of the Mysteries.[29]

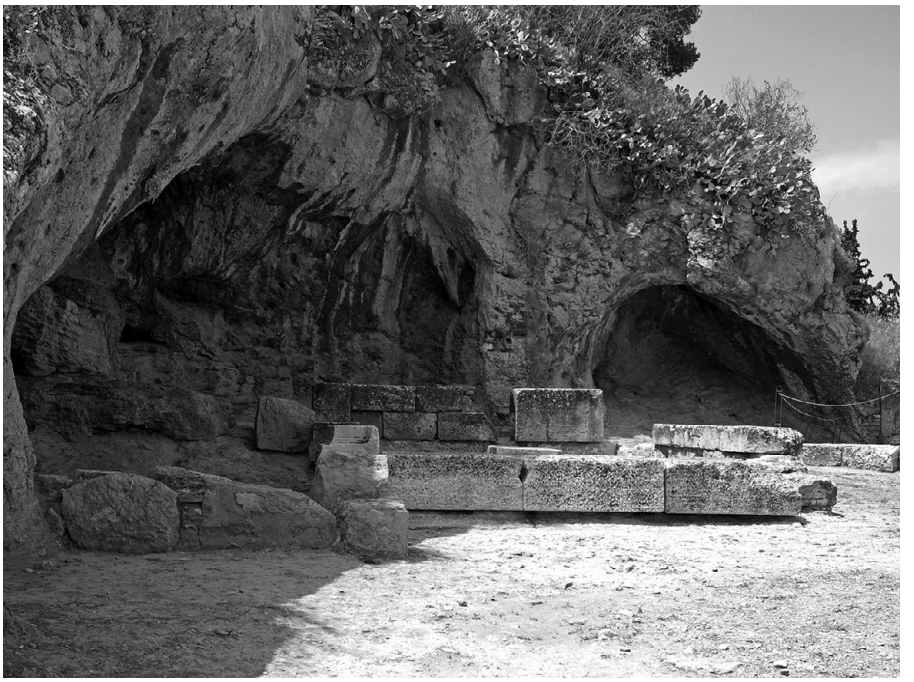
The Greater Mysteries were held annually, with a special celebration every fourth year (*penteteris*), starting on 15 Boedromion (late September–early October) and lasting up to nine days. The sacred truce for the Mysteries lasted between 15 Metageitnion (ca. late August) and 10 Pyanepsion (ca. late October).[30] On the day before the Mysteries started (14 Boedromion), the *hiera* were taken by procession to Athens and were deposited at the City Eleusinion.[31] The City Eleusinion, located below the north Acropolis slope, by the Agora, was associated with Demeter at least from the mid-seventh century, although at that date it may have been an open-air shrine.[32] It is likely that the connection between the two sites existed by this time, if not earlier. In the first half of the sixth century, both sites were given new structures: the City Eleusinion received a wall enclosure in the upper terrace, and Eleusis received the Solonian Telesterion.[33] The temple of Triptolemos is the best-preserved temple of the City Eleusinion, but does not appear to have been associated with the religious procedures of preliminary mystery initiation taking place in

the sanctuary.[34] Since the exact position of the temple of Demeter and Kore – probably located in the innermost part of the sanctuary – has not been identified,[35] it is not possible to compare its layout and orientation to the Eleusinian Telesteria.

Several ancient sources associate the Eleusinian Mysteries with stars and the night sky,[36] as do for example the references to the appearance of stars signalling the beginning of the night.[37] This could be partly because of the timing of the rituals, which were performed during the night, but it is also natural that the presence of the stars during these procedures would have created a link between the rites and the overseeing cosmos, not least because the stars, seen as dancing in the night sky, were compared to the dancing of the initiates during the mysteries. The reference in *Ion* exemplifies this: 'if near the dancing springs on the twentieth day of the moon, a pilgrim sees the torch at night sleepless. When the *aether* of Zeus' starry sky joins in the dance, and the moon dances and the fifty daughters of Nereus . . .' (1075–83, transl. author). A scholion interprets Sophokles' description of Dionysos-Iakchos as the 'chorus-leader of the stars . . . according to a mystic formula'.[38] But Dionysos is also identified with the sun in Eleusis, and we are told that the first Eleusinian priest, Eumolpos, described the god as 'shining like a star fiery in rays'.[39] The importance of dancing is also present in later sources such as Lucian, who states that the mysteries were 'danced', not spoken,[40] but also in the common use of *schemata*, interpreted as gestures or dance movements.[41] Similarly, iconographic representations of the hierophant Eumolpos and scenes of initiation depict the participants as if dancing (Figure 48).[42] This analogy with the stars is not unique to the mysteries: we saw in Chapter 5 that the resemblance was also present in the rituals of Artemis Orthia.

Initiation proper started on the sixth day, with fasting during the day and the culmination of the most important time of the initiation taking place between the night of 20 and the early morning of 21 Boedromion. The nocturnal rites involved the search for Persephone, her appearance, and the subsequent reunion of the two goddesses. At least part of these *dromena* was performed in the platform outside the Telesterion and involved, among other activities, the initiates lighting their way with torches.[43] The search for Persephone probably ended in the area of the Ploutonion, where the initiates witnessed the priestess of Demeter, dressed as Persephone, emerging from the cave. The steps carved into the rock of the outer part of the cave leading to its interior through a small hole attest to such a *dromenon* (Figures 49 and 50).[44] From the two open-air spaces used during the mysteries – in front of the Telesterion at least from the fifth century BCE,[45] and in front of the Ploutonion cave – the initiates had direct contact with the night sky. These two areas and the Mycenaean platform discussed previously all allow views towards the same eastern horizon (Table 6.1). I do not argue that Classical evidence can be

48. Red figure votive plaque depicting scenes from Eleusinian initiation, fourth century BCE. Museum of Eleusis (photo by E. Boutsikas)



49. Ploutonion. The smaller cave, to the right, is the location from where the priestess of Demeter is believed to have emerged (photo by E. Boutsikas).

50. The interior of the smaller cave, showing the chasm from where the priestess emerged, and the exterior, showing the steps leading to the chasm (photo by E. Boutsikas)

retrojected to conclude a continuity of practices from the Mycenaean to the Classical period, but pairing this evidence can assist in asserting that this orientation had perhaps been significant from an early date, and certainly from the Archaic period.

Astronomy

We briefly mentioned in Chapter 5 Sourvinou-Inwood's argument for the importance of the night sky in the Eleusinian Mysteries in her treatment of a section of Euripides' *Erechtheus*.[46] She argued for an association between the Hyades and the mysteries on the basis that both the constellation and Demeter were associated with agriculture, and found further support for this idea in the mythical links of the Hyades with Dionysos, who, in his turn, played a role in the mysteries.[47] The association of the movement of the Hyades with agriculture indeed finds confirmation in the ancient sources, but this is not sufficient to lead to the conclusion of a link with the mysteries. For such an association, it is important that astronomically significant events of the selected target occurred at the time of the mysteries. As we observed in Table 5.2, the movement of the Hyades (in late October, early November, early April, and June) cannot be linked to the timing of the Lesser or the Greater Mysteries;

TABLE 6.1. *Orientations of the structures discussed in this chapter*

Location	Structure	Date	Azimuth	Altitude	Declination
Eleusis	*megaron*	Mycenaean	111°	2°	−15°
	Telesteria	Archaic–Classical	115°	2°	−18°
	Ploutonion	Archaic	103°	2°	−9°
Lykosoura	Temple of Despoina		90°	0°	0°
	side entrance		180°	31°	−22°
Samothrace	Hall of Choral Dancers – *Temenos*	Classical	314°	0°	+32°
	Hieron	Hellenistic	341°	0°	+45°
	side entrance		71°	14°	+23°
	side entrance		251°	6°	−10°
	Anaktoron	Roman	243°	5°	−17°
	Altar Court	Hellenistic	71°	14°	+23°

instead, it is very close to the timing of the Arrephoria and the commencement of the weaving of Athena's *peplos*. Yet, the idea of linking the timing of the mysteries with the movement of an agricultural astronomical marker makes sense, given the cult's strong connection with agriculture. It is fitting that the mysteries were timed at the turning of the seasons: the Greater Mysteries were held around the end of September or early October, at the time of the autumn equinox (29 September in 500 BCE). Similarly, the Lesser Mysteries occurred around the time of the spring equinox (20 March in 500 BCE) (Table 6.2). The orientation of the Telesteria, but particularly the orientation of the Ploutonion, is very close to the rising position of the sun at the equinoxes. This means that during the days of initiation, the structure would be flooded by the light of the rising sun.

The equinoxes are witnessed by observing the sun's position in the horizon at sunrise (or sunset) and the length of daylight. In ancient communities, the movement of the sun at the equinoxes marked the beginning of darker or brighter periods in the year, the change of seasons. At the time of the Lesser Mysteries (middle to late Anthesterion)[48] and Persephone's return from the underworld, the spring equinox marks the beginning of spring and longer days. During the next few months, until the summer solstice in June, days are longer than nights. The Greater Mysteries in October, taking place at the time of the autumn equinox, marked another change of seasons, signified by the reversal in the length of light, with days becoming shorter than nights. Thus from the end of September (when Persephone descends to the underworld), the earth witnesses less sunlight until she returns again. The Eleusinian structures involved in mystery initiation were oriented towards sunrise at this time in the year, when the mysteries were held. Initiation offered reassurance

TABLE 6.2. *The timing of the mysteries compared to the movement of Virgo and Spica. In 500 BCE the autumn and spring equinoxes ocurred on 2 October and 23 March, respectively; in 400 BCE, on 1 October and 22 March, respectively*

Attic months	Festivals	Equinoxes	Movement of Virgo & Spica	Gregorian months
(1) Hekatombaion			**Heliacal setting** (10–13 Aug.; **Spica** 10–12 Aug.)	July–August
Metageitnion			**Invisible**	August–September
Boedromion	**Greater Mysteries** 15–23 (D) *Kore to UW*	**Autumn equinox** (1–2 Oct 500–300 BCE)	**Invisible** **Heliacal rising** (1–15 Oct.; **Spica** 5–7 Oct.)	September–October
Pyanepsion	*Kore in Underworld*			October–November
Maimakterion	*Kore in Underworld*			November–December
Poseideon	*Kore in Underworld*			December–January
Gamelion	*Kore in Underworld*			January–February
Anthesterion	*Kore in Underworld* **Lesser Mysteries** 20–26? (P) *Kore returns*	**Spring equinox** (22–23 March 500–300 BCE)	**Acronychal rising** (20 Feb.–13 March; **Spica** 5–7 March) **Cosmical setting** (12 March	February–March
Elaphebolion			–9 April; **Spica** 30–31 March)	March–April
Mounychion				April–May
Thargelion				May–June
Skirophorion				June–July

through light connotations, and perhaps reassurance that darkness (both spiritual and physical) was only temporary until the prevailing light was celebrated again in the next Lesser Mysteries. The natural cycle continued, as did the cycle of light and darkness. What may have been of importance is not only the change in the seasons and length of light and darkness which followed from the equinoxes, but also this precise time, when the day and night are of equal length. This moment in the year had eschatological significance in Greek cosmology, denoting an ideal state of balance and equality. Days and nights of equal length were believed to exist in the Valley of the Blessed in the underworld, but are also argued to have been present in Pythagorean texts, which promoted a notion of 'light and darkness having equal shares in the cosmos'.[49]

The witnessing of the rotating cosmos combined with the Eleusinian procedures coincides with another astronomical occurrence, adding further depth to the complexity of the cult. The timing of the Lesser and Greater Mysteries coincides also with the movement of Spica and the overall movement of the constellation of Virgo (Table 6.2), both visible from the areas in front of the Telesterion and the Ploutonion. The Ploutonion (dec. -9°) was oriented 11° from Spica's declination ($+3^{\circ}$ in 500 BCE). The heliacal rising of Spica (Latin for 'ear of grain', named *Stachys*, 'wheat', by the ancient Greeks), the brightest star in the constellation of Virgo, coincided with the mysteries. Between 600 and 400 BCE, Spica returned to the night sky after its annual period of invisibility with its heliacal rising around 5–7 October (Table 6.2). During the months of Persephone's stay in the underworld, no important phases of the constellation of Virgo or Spica occurred – until her return during the Lesser Mysteries in the second half of Anthesterion, coinciding with the time of Spica's acronychal rising (Table 6.2). We discussed that agricultural activities were timed according to stellar observations. It does not come a surprise that Demeter, the most important divinity for the fertility of the land, would have festivals associated with the change of seasons and timekeeping. An explicit example of such correlation is the festival of Proerosia, an elusive pre-ploughing festival associated with Eleusis and honouring Demeter, but also celebrated in other demes in Attica. The festival is called by Hesychios Proarktouria (before the rising of Arktouros), which confirms its deliberate timing just before the heliacal rising of Arktouros.[50]

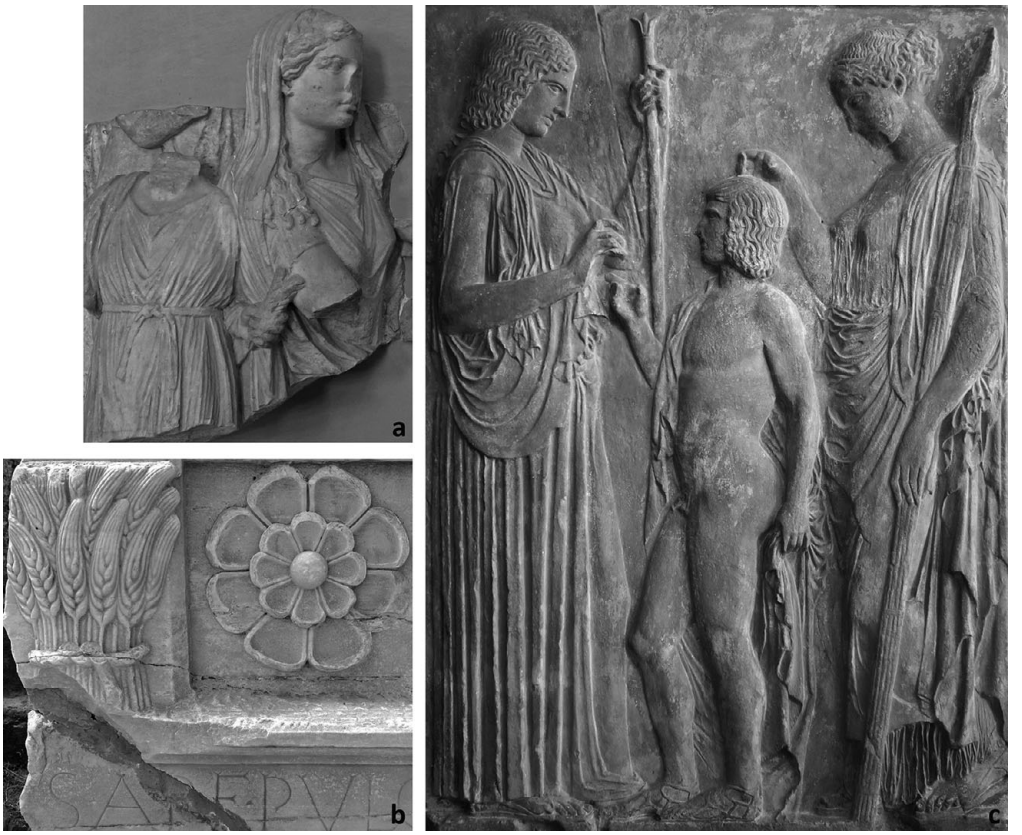
The connection between astronomy and the mysteries is further supported by the identification of Virgo as the celestial representation of Demeter holding an ear of wheat (Spica).[51] *De Astronomia* preserves the Hesiodic identification of Virgo as Justice, the daughter of Zeus and Themis, but mentions that the constellation was also identified with Demeter.[52] Aratus' description of the constellation as a female figure carrying 'in her hands the radiant ear of wheat' has also been identified with Demeter. Aratus links the constellation to the myth of Justice; however, the celestial figure of Justice does not hold an ear of wheat, as Aratus states, but instead the scales of Justice.[53] The association of Spica with an ear of wheat predates Aratus and is probably Babylonian.[54] Spica was known as the 'ear of wheat' in the constellation of Virgo from at least the pre-Seleucid period (prior to 323 BCE). A Babylonian tablet from this period refers to Spica as the 'bright star of the corn-stalk' and γ *Virginis* as the 'root of the corn-stalk'.[55] A slightly later clay tablet from the Seleucid period shows a depiction of the constellation as the Virgin holding the ear of wheat, a representation shared by the Babylonians, Egyptians, and Greeks.

The Greek name of Spica and the star's movement are clear indicators of the star's association with the agricultural year. Agricultural links are also clear for

the third brightest star of the constellation, *ε Virginis*, which the Greeks called Protrygeter ('the fruit-picking herald').[56] Its heliacal rising is thought to have been used in the fifth century BCE, if not earlier, by Euktemon to herald the time of grape harvesting.[57] The same event, which followed the star's annual invisibility period, coincides with the beginning of the mysteries (Table 6.2). The ancient Greeks watched for Protrygeter and Spica from at least the fifth century BCE, as testified by a number of *parapegmata*, which list a number of these observations.[58] Geminus' *parapegma*, for example, lists the appearance of Protrygeter on the tenth day of the sun crossing Virgo. It attributes the observation to Euktemon, and the twenty-fourth of the same month records the heliacal rising of Spica.[59] The eighteenth of the previous month is marked on the same *parapegma* as Protrygeter's heliacal setting according to Eudoxus.[60] Protrygeter is the herald of Virgo's rising, because it is the first of the constellation's bright stars to be seen to rise or set, followed by Spica a few days later.

These astronomical references are linked by a number of mythical correlations between wheat and Eleusis. First, a topographic link is mentioned in Euripides, when Theseus' mother Aethra makes a preliminary sacrifice at Eleusis, the place 'where the ear of corn first appeared'.[61] In accordance with this association, we find the prize of a portion of corn from the Rarian field in the festival of Eleusinia, which was believed to have been founded in celebration of Demeter's gift to mankind.[62] This evidence attests to the significance of Eleusis as a place closely tied with agriculture and, more specifically, with the cultivation of wheat.

Temporally, the heliacal rising of Spica and Virgo at the time of the Greater Mysteries coincides with the renewal of Demeter's blessings to mankind in Eleusis.[63] It is possible that the plea to Demeter in the hymn by Philikos,[64] 'Lead Persephone back beneath the stars',[65] denotes this association between the goddesses and the movement of the constellation. Virgo is seen to rise annually above the horizon, just as Persephone ascends from the underworld. Furthermore, the idea expressed in the Orphic Hymns that Demeter inhabited the stars, combined with Prodicus' reinterpretation of Demeter as 'the deified wheat',[66] matches the astronomical representation of Demeter holding an ear of wheat rising heliacally at the time of the Eleusinian Mysteries. Further symbolism appears in the announcement of a divine birth at the culmination of the mysteries (at least at the end of the fifth century BCE).[67] During the *epopteia*, the words spoken about the birth of Brimo to Brimos have been interpreted as a celebration of the arrival of wheat and its personification.[68] This interpretation agrees with the timing of the ritual, which would have witnessed the arrival of the celestial wheat in the pre-dawn sky during the concluding moments of ritual performance. This astronomical observation, occurring at the end of the night when the rituals were coming to completion, could perhaps be linked with the display of an ear of wheat, believed to have



51. Examples of Eleusinian reliefs with depictions of wheat: (a) Fragment of votive relief showing the myth of Triptolemos, first century BCE; (b) Roman relief showing ears of wheat; (c) Roman copy of Greek stele showing Demeter handing an ear of wheat to Triptolemos, while Persephone places a garland (lost) on his head, original date ca. 450–425 BCE (photos by E. Boutsikas)

been one of the objects revealed during the mysteries and/or shown at the end of the search for Persephone.[69] Complementary to this information derived from the written sources is a wealth of iconographic representations from Eleusis. These connect the cult with ears of corn (e.g., Figure 51) and, of course, barley was the main ingredient of the *kykeon*, the special drink of the Eleusinian Mysteries.[70]

The open-air space in front of the Telesterion and the Ploutonion allowed the *mystes* to observe Demeter's celestial representation rise towards the end of the night. This may have been a compelling reaffirmation of the goddess witnessing the proceedings. As exemplified in Hesiod's *Works and Days*, the tight connection between agricultural timekeeping and the movement of stars leaves no doubt as to the widespread use of this practice. The verbal formula of the ritual described in the much later Hippolytos involves some symbolism in connection with the agricultural events about to take place in the next few

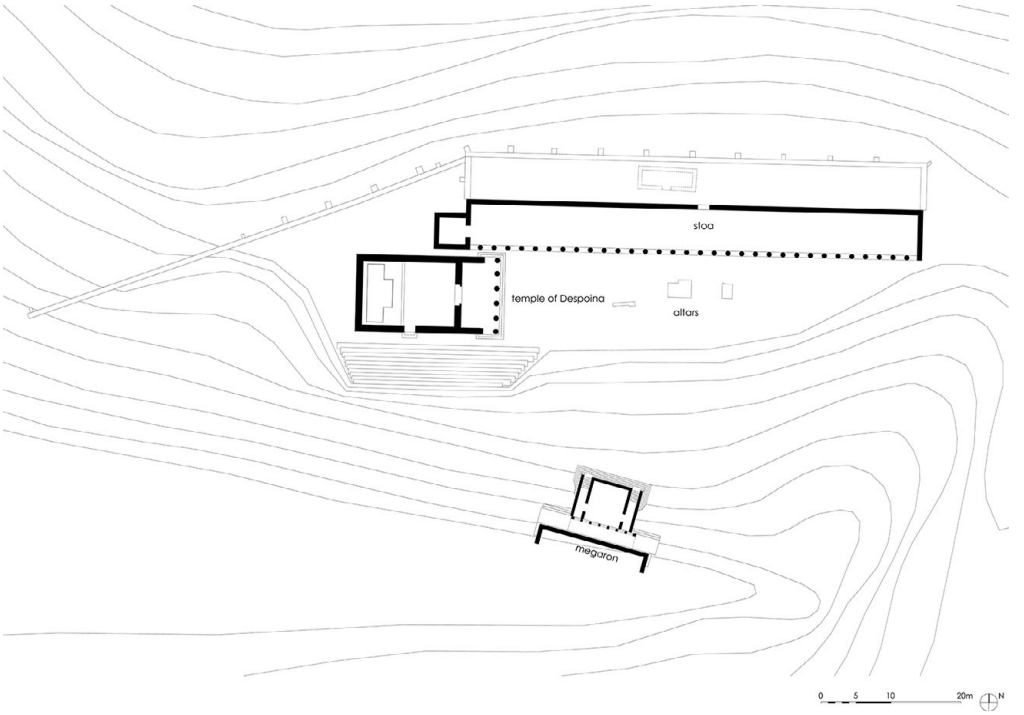
months and the role of the cosmos.[71] The anticipation of rain in order for the sown grain to grow out of the earth is comparable to Kore's stay in the underworld until both Kore and the crops return to the world above,[72] at the time of the spring equinox, the acronychal rising and cosmical setting of Virgo, and Spica's acronychal rising. This syzygy and the cognitive environment of the mysteries, comprised of the timing of rituals, the aetiological myth, landscape, and astronomy, must have allowed the extended cognition of the *mystes* to combine all these elements when forging interpretations of the mystery experience. Interactive cross-cueing assisted also in evoking these connotations, symbolism, and the memories of the initiates. Eleusis was the place where this cosmic convergence occurred once a year, during the mysteries.

The philosophical aspect of the mysteries, acquired in the later centuries, shifted the emphasis from concern over Persephone's fate and sowing to the hierophant's mystical nocturnal procedures.[73] This demonstrates a shift in concern towards a lasting and life-transforming experience achieved through actions leading to a change in the participants' state of mind. Such an experience inevitably involved the cosmos. This can also be deduced by the third-century-BCE reference of Kleanthes, which has been identified with the Eleusinian procedures.[74] He talks about dancing in the mysteries as a reference to the cosmos, where the stars and sun dance around the earth.[75] The experience was strong enough to constitute a change of consciousness at Eleusis, as related by Sopater: 'I came out of the mystery hall feeling like a stranger to myself.'[76] Similar but earlier references identified as describing Eleusinian procedures not only concur with this description, but also describe an out-of-body experience, during which the souls arrive at the highest summit of heaven and the rotating cosmos carries them round, enabling them to glance upon what exists beyond heaven.[77] This initiation experience resembles the experience of the two goddesses in myth. Persephone returns, but her return is conditional, for she must henceforthspend part of the year in the underworld. This major change in her (and Demeter's) existence resembles the life-changing experience of the initiates. In addition, like Persephone, the initiates gain a glimpse of what lies beyond this world through the revelation of the mysteries. These events assign cosmological significance to Eleusis. Ancient authors emphasise that the revelation did not involve discovering something that the initiates did not know already, but rather the transformation of the initiate's perception of the cosmos, which occurred through what they experienced.[78] The initiation involved a new spiritual and psychological experience, one which introduced a different way of viewing and understanding the cosmos.[79] Ritual dying, or at least an experientially intense change of state of mind, is believed to have been part of the initiation process.[80] Ritual dying was characterised by darkness and both conditions ended concurrently during the

revelations, which, we are told, were accompanied by overwhelming brightness.[81] Successful initiation relied on the initates reaching the desired state of mind, meaning that emotions and the senses must have been its focus. The described feelings of terror of the Eleusinian initiation, such as shuddering (*phrike*), shivering, sweating, and amazement, allude to such an experience.[82] Interestingly, a similar rhythm of experience described in Plato's *Phaedrus* occurs in response to seeing 'a godlike face'.[83] This comparison betrays the breath of divinity present in the initiatory procedures.

The long lifespan of the mysteries must have affected the aims, rituals, and revelations, which are unlikely to have remained unchanged for a millennium. Yet, the space where the performance of these activities took place and the timing in the year must be two of the least-altered components of the mysteries throughout the centuries. Archaeological and literary evidence alike confirm the importance of the area in front of the Telesterion and the Ploutonion, and ancient references testify to the importance of performing rituals at the correct time.[84] The agricultural year, which was inseparably connected to the celestial cycle, articulates the cosmic significance of the Eleusinian Mysteries. The initiates left with more than just a promise for a better afterlife: they acquired a ritual insight into the function and structure of the cosmos. The celestial representation of Demeter holding the ear of wheat paired with the equinoctial nights and days are ritual correlatives. Demeter renewed her guarantee of her protection of the crops and her blessings during the mysteries before the beginning of the agricultural year.[85] She also did so by reappearing in her celestial form at the time, when the sun rose in the constellation of Virgo a few days before the autumn equinox.

Although the bright light flooding into the Telesterion has been likened to the sun,[86] the schema connects the proceedings of Eleusis with the cosmos, but does not claim that the viewing of the constellation or the rays of the equinoctial dawn conveyed the much sought-after mystery of the Eleusinian revelations. Rather, this spatio-temporal analysis of the mysteries contributes towards their contextual understanding. The temporal conjunction of the appearance of Virgo and Spica and the timing of the mysteries in relation to the equinoxes could be perceived as the manifestation of Demeter's epiphany during the mysteries, the manifestation of the special relationship claimed between Eleusis and the two goddesses, and the enhancement of the sanctuary's status, which could legitimately claim divine patronage of the promises made during mystery initiation. Through embodiments, these astronomical observations and religious messages would have heightened and enhanced initiatory performances and activities and they may have accompanied the verbal revelations. Allusions to the connections listed here may appear inexplicit, but similarly, we would have known nothing of the existence of the Ploutonion in Eleusis if we relied solely on the written sources, as none

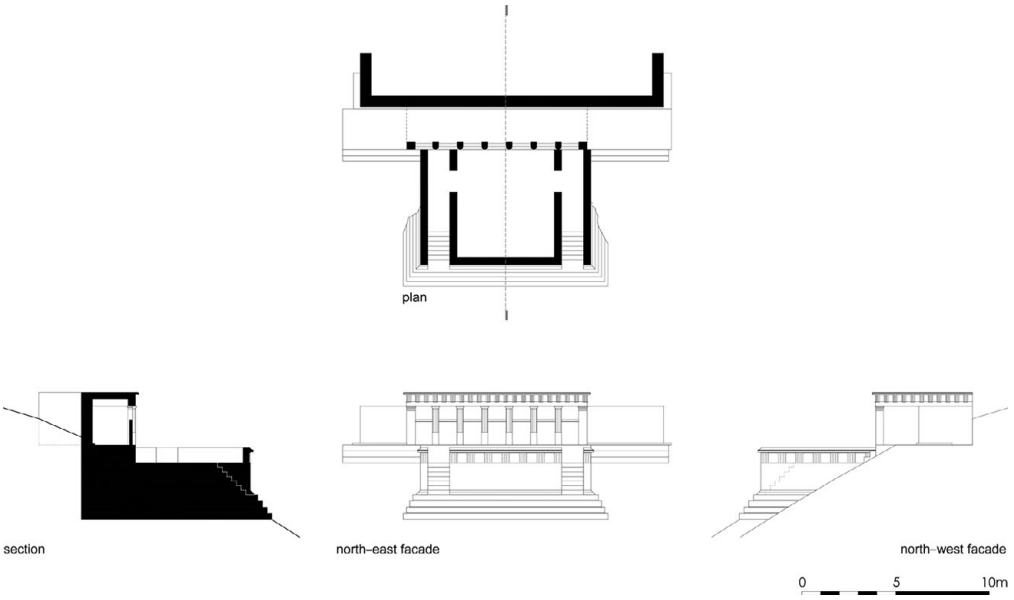


52. Ground plan of the sanctuary of Despoina in Lykosoura (adapted after Kourouniotis 1912 and Leonardos 1896 by Socratis Tsacos)

mentions it. It is only from excavated inscriptions that the temple has been brought to light, piecing together another fragment of evidence. Similarly, in the absence of props, underground structures, and machinery, we can but conclude that the power of the Eleusinian revelations must have relied on simple ritual symbolism, which asserted divine presence in order to convince initiates of the promised transcended conventional mortal capabilities resulting from inititation.

MYSTERIES OF DESPOINA IN LYKOSOURA

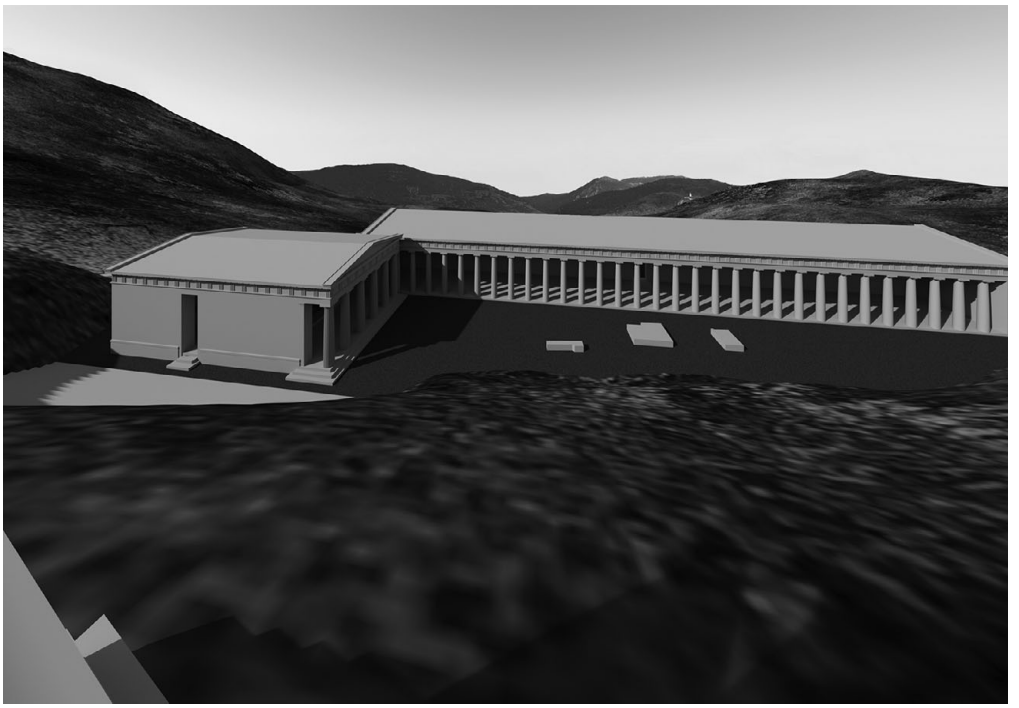
According to the Arkadians, Despoina was the daughter of Demeter and Poseidon.[87] She was the primary deity of the city of Lykosoura and the most venerated Arkadian deity, if we follow Pausanias.[88] He calls Lykosoura the oldest city in the world, but this mention must have alluded to something else other than a literal belief in the city's antiquity. Despoina had a famous and important mystery cult in her sanctuary in Lykosoura (Figure 52), where she was closely connected with Demeter, Persephone, and Artemis,[89] but the only surviving testimonies to the mysteries are the inscriptions and sacred laws excavated at the sanctuary which allude to initiation.[90]



53. Reconstruction of the *megaron* in Lykosoura (adapted after Kourouniotis 1912 by Socratis Tsacos)

Two temples existed at the sanctuary, one to Artemis Hegemone and the other to Despoina, but the former is yet to be located.[91] The temple of Despoina displays various phases of construction, so its precise date is far from straightforward. The repairs of the second century AD, according to Kourouniotis and Jost, concerned minor changes and not a major architectural programme.[92] The bricks used and the way the *sekos* was paved date the structure to the end of the fourth or the beginning of the third century BCE.[93] Similarly, a brief comparison of the overall temple design (e.g., the *prostyle hexastyle* plan with the extended façade, the shape of the *akroteria*, etc.) finds parallels in other fourth-century temples, but a Hellenistic date has been favoured more recently.[94]

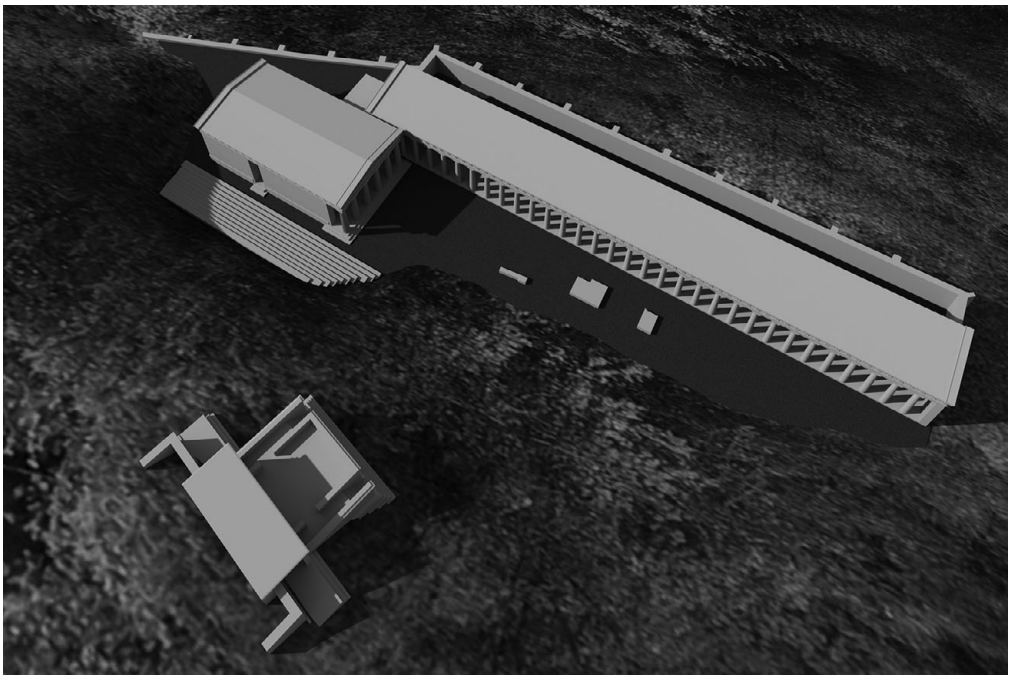
From Pausanias we know that the mysteries were not performed in the temple of Despoina but in the *megaron*.[95] This has been identified with the Hellenistic structure to the south-east of the temple, on the north slope of Terzi (Figures 52 and 53).[96] The positioning of the *megaron*'s platform, although on higher ground, enabled participants to enjoy uninterrupted views to the N–NE landscape and horizon, only when standing at its northernmost part (Figure 54). The wall surrounding the platform blocked horizon views when standing at the centre of the platform. Similarly, horizon views were restricted by the layout of the structures and the hill rising sharply in the lower terrace. Kourouniotis' 1912 reconstruction shows that access to the *megaron* was via a wide staircase, which turned into two narrower flights of stairs framing either side of a raised platform (Figures 53, 55, and 56). At the top of the stairs



54. Reconstructed view of the sanctuary of Despoina from the northernmost area of the *megaron*'s platform (by Socratis Tsacos, Lloyd Bosworth, and Efrosyni Boutsikas)

was a stoa-like structure, the *megaron*, which faced north-east, but is very poorly preserved. Its intercolumnar spaces were blocked by a wall, rising to a height of ca. 1.36 m. This would have obstructed the visibility of any activities occurring in the interior to those standing outside the colonnade. The monumentality of the *megaron* signifies its importance to the mysteries and the carbonised finds recovered in its interior point to the presence of an altar and thus ritual activity.[97] Despite the presence of some clues, which have led to reconstructing some of the activities taking place during initiation on the terrace of the *megaron*, as with most other aspects of this cult, we are mostly in the dark about the types of rituals that took place here.[98] It is believed that the initiatory activities associated with the *megaron* involved a procession of *kanephoroi*, dances by the *mystai*, and priests wearing masks and carrying animal limbs.[99]

In the lower terrace, the function of the ten steps carved into the slope outside the temple's side entrance has puzzled archaeologists for years (Figures 55 and 57). The length of the higher steps is the same as the temple's south wall, but the lower steps are longer and there is a progressive increase in their depth (i.e., narrower at the top and deeper at the bottom).[100] While they certainly helped stabilise the precipitous slope,[101] there can be no doubt that



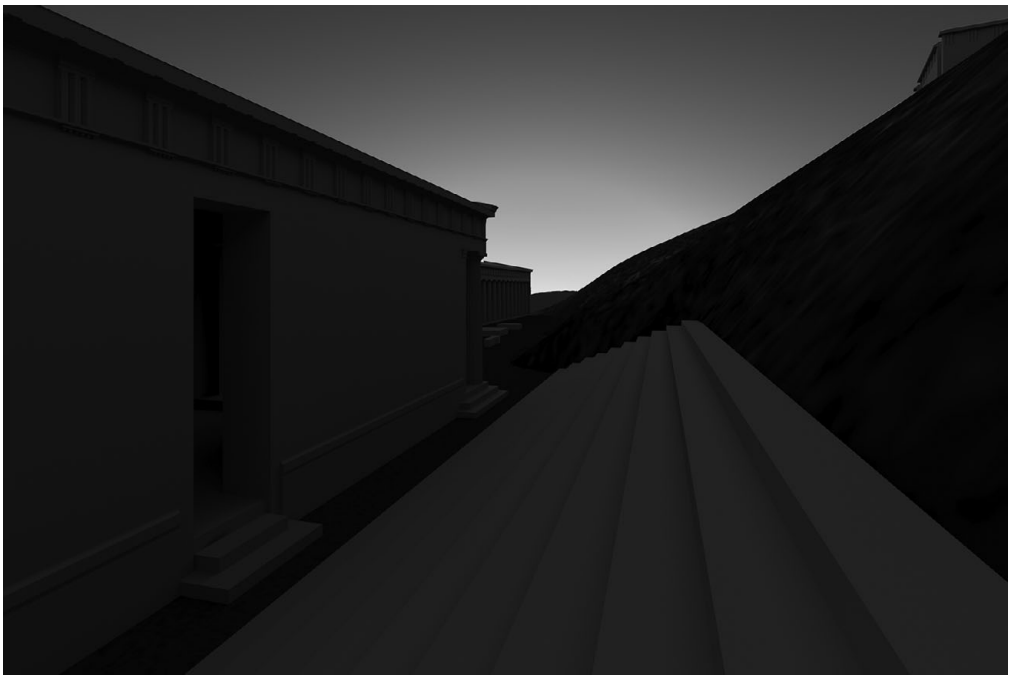
55. Bird's-eye view of the sanctuary of Despoina (by Socratis Tsacos and Lloyd Bosworth)

56. Reconstructed view of the sanctuary of Despoina from south-east (by Socratis Tsacos, Lloyd Bosworth, and Efrosyni Boutsikas)

57. The temple of Despoina and south steps outside the temple's side entrance from the east (photo by E. Boutsikas)

58. Temple of Despoina view of south (side) entrance from south steps. The east entrance is invisible from this location (photo by E. Boutsikas)

they served primarily as viewing platforms for activities performed in front of the temple's south entrance (the top steps used probably for standing and the bottom for sitting).[102] However, the 1.6 m space between the base of the steps and the temple's wall leaves very little room for any performance to have taken place there (Figures 57–59). Nielsen's idea, that the stairway was used by spectators watching performances taking place in the space of the temple's front entrance,[103] is now abandoned, as it would have been impossible for the majority of the spectators to view the area of the east entrance from these seats. This is also apparent in Figures 58 and 59. If visibility of the sanctuary's east area was the aim, the steps would have been constructed further east, so that they faced the open space in front of the temple. An alternative interpretation reconstructs the performances in a sequence starting from the north stoa of



59. Reconstruction of the temple's side entrance and south steps showing the restricted views to the east from this position. Reconstruction is timed at sunrise on the equinoxes. For colour version, see the plate section. (by Socratis Tsacos, Lloyd Bosworth, and Efrosyni Boutsikas)

the lower platform, where the re-enactment of Poseidon's chasing of Demeter and the birth of Despoina took place. This was followed by the showing of sacred objects (*deiknymena*) as a two-stage procedure, with the participants moving from the north hall to the south steps next to the temple.[104] Consensus is that a priest stood at the south porch, perhaps showing (*deiknymena*) or speaking (*legomena*) to those gathered at the steps.[105] The sixth-century-BCE fragment of the Sophilos *dinos* depicting spectators of the funerary games in honour of Patroklos sitting on *ikria* resembles very much the arrangement we see in Lykosoura (Figure 60). The *dinos* scene is interesting also in that it depicts both seated and standing spectators who are seemingly participating in the performances (through gestures of outstretched hands). The use of masks during the mysteries and the presence of the steps indicate the re-enactment of ritual drama.[106] Masks and a theatral area were also present, as we saw in Chapter 5, at the Spartan sanctuary of Artemis Orthia, but the layout of the Spartan temple and theatre is very different to that of Lykosoura. The presence of the steps in Lykosoura must mark the area where ritual performance was taking place, but given the confined space, this performance must have been limited to only a small number of performers with constrained movement. This reconstruction is assumed from the period when the temple was built onward, but the construction of the steps may predate the temple,[107] although

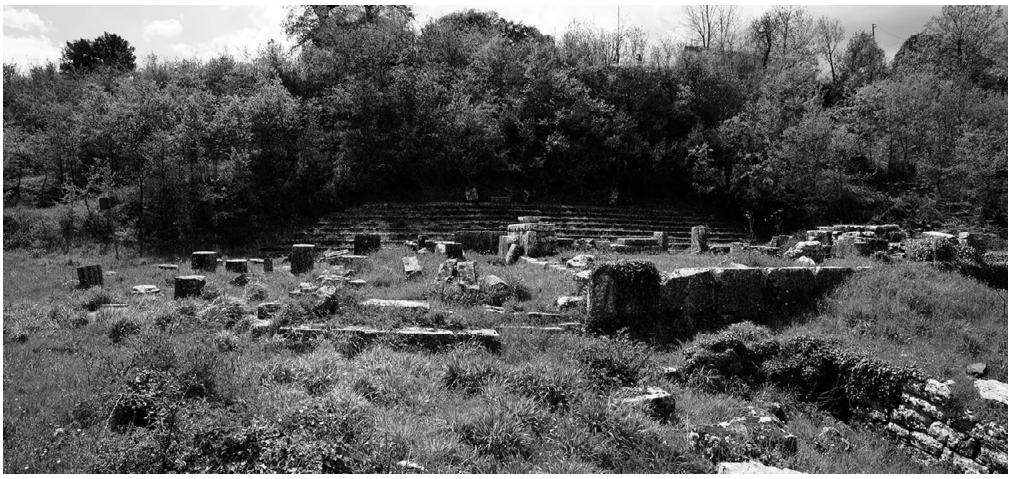
60. Fragment of the Sophilos dinos, 580/70 BCE (inventory no. 15499). With permission of the National Archaeological Museum, Athens (Photographic Archive) © Hellenic Ministry of Culture, Education and Religious Affairs/Archaeological Receipts Fund.

we are completely in the dark about the rites taking place there during this phase. It has been suggested that the area occupied by the temple was used for performances prior to the temple's construction; the construction of the temple over the supposed performance space indicates abandonment or partial replacement of these performances and their displacement to the area in front of the temple near the altars, with spectators watching from the north stoa (Figures 54 and 56).[108] The same interpretation assumes the display of objects in the area where the steps were located, with the priest standing in front of the south temple entrance, but this, it is argued, would have been attended by a smaller number of spectators. The interpretation is not wholly satisfactory, as there is no wall or structure to confine the area of the steps, so it is difficult to establish how crowd flow would have been controlled and the crowd separated into smaller and larger groups, or how the proposed segregation would have been achieved in such an open area with no boundaries to isolate the stoa and altar area from the steps and south temple entrance. If the area of the steps was reserved for performances addressed to a select few, how was secrecy ensured?

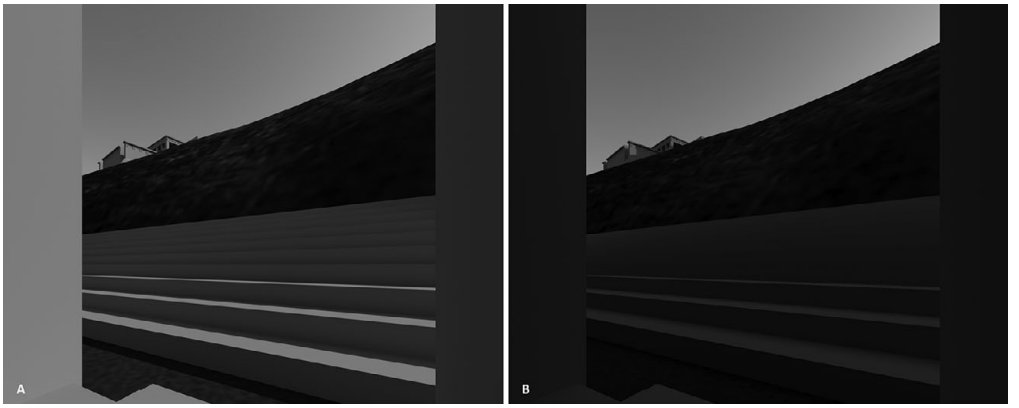
The view from the main entrance of the temple of Despoina is particularly limited. The stoa in the temple's immediate north-east completely restricts any

61. Eastern horizon and open area and altars in front of the temple of Despoina (photo by E. Boutsikas)

views in that direction and the steep hill rising on the south-west functions in a similar manner. These features framed the only uninterrupted horizon in front of the temple's entrance, facing due east (Figure 61). The idea that any performances may have taken place to the east of the temple, around the altar, has been almost unanimously dismissed based on the limited view the seated spectators would have had.[109] The area in front of the temple does not bear any evidence of accommodating crowds, but it is wide and relatively spacious, allowing unobstructed visibility of the east horizon and sunrise. In the absence of any indication regarding the time in the year in which the Mysteries of Despoina were held, the only possible observations relate to the temple's orientation. Its main entrance is oriented to the position of the rising sun during the equinoxes (dec. 0° and azimuth 90°) and, accordingly, the side entrance is oriented close to the sun's position at the winter solstice (Table 6.1). If the Mysteries were held at or near these times, spectators would witness the illumination of the temple's interior at sunrise. If the main and side entrance doors were left open during the religious proceedings, and if performances were taking place just before dawn at this time of the year with initiates positioned on the steps, the illumination of the temple's interior (and perhaps the cult statues) by the rays of the rising sun could have been witnessed by those spectators standing in the centre of the steps. Such an observation would have greatly enhanced the mystery experience in Lykosoura, but would be visible only to a very small crowd if gathered in the south and to a larger group standing in the east area in front of the temple or the stoa. Interestingly, the orientation of the main entrance of Despoina's temple is very similar to the side entrance and effects we examined in Chapter 4 for the temple of Apollo in Bassae, located also in Arkadia.



62. Temple of Despoina view of south hill and steps (photo by E. Boutsikas)



63. Reconstruction of the view from the temple's side entrance towards the south hill and steps during the day (A) and at sunset on the winter solstice (B). For colour version, see the plate section. (by Socratis Tsacos and Lloyd Bosworth)

The unusually high southern altitude resulting from the proximity of the sharply rising hill into which the steps are carved (Figures 56, 62, and 63) creates an interesting phenomenon. At times close to the winter solstice, when the winter sun does not climb very high in the sky, the hill rising behind the theatral area steps causes the sun to set a few minutes after midday, making the length of the daylight particularly short in this location. In an average horizon of ca. 3°–6° altitude, the sun would set to the south-west at this time of year. However, in Lykosoura, from the area of Despoina's sanctuary (south altitude 31°), the sun is seen to set behind the hill while it is still due south, before climbing down towards the west. This setting point of the sun in the south horizon is in line with the temple's side entrance. If the horizon's altitude at

this point was only a few degrees lower, e.g., 25° rather than 31°, the declination of the side entrance would have been outside the sun's setting range in the horizon. Current evidence does not allow us to suggest with certainty the intentionality and incorporation of these solar effects in the timing of the mysteries. Nevertheless, topographic analysis of Despoina's temple in relation to its surrounding landscape demonstrates that the temple's entrances were oriented towards the position of the sun for three out of the four total annual solar events (both equinoxes and the winter solstice).

Present evidence allows us to suggest only the performance of nocturnal procedures on the basis of the lamps found at the sanctuary,[110] but our understanding of the actual cult of Despoina is tenuous. Pausanias deliberately leaves out any information on the rites and iconography of the cult statue group.[111] A cosmic significance of Despoina's cult has been suggested based on the iconography of her veil's division into bands, each with different themes, indicating the complexity of the decoration. The marine, animal, and human figures, along with the eagles, thunderbolts, and triangular rays, combine the domains of the earth, sea, and sky, and may attest to the cosmic role of Despoina's cult, particularly if we accept the suggestion of the veil being replicated as a hieratic garment.[112] Parallels with the Eleusinian Mysteries with added local elements have been argued for Lykosoura on the grounds of the iconography of Despoina's cult statue complex: Demeter holding a torch and Despoina with a cist. Demeter had an altar at the sanctuary next to Despoina, and Pausanias' mention that all cultivated fruits except pomegranate are brought to the sanctuary clearly refers to the fruit's role in the myth of Persephone's abduction.[113] Although these Eleusinian influences were perhaps present, they may have been superficial and have been questioned.[114] Eleusinian influence cannot be excluded, but at the same time, it does not seem to have detracted from the essential local characteristics, as the surviving evidence makes a clear case for the cult having both original and native traits.[115] A comparison of the structural orientation of the cult buildings at the two sites reveals that the side entrance of the Lykosoura temple is oriented within 4° of the main entrance of the Eleusinian Telesterion. It is possible that, as in Eleusis, divine epiphany played a role in the Lykosoura proceedings. If so, this stage of initiation was probably performed around the temple (either in front of the south entrance, or perhaps in the east area around the altars). We have seen that the positioning of the temple allows for both entrances to be associated with annual solar events, and the equinoxes, in particular, were also linked with the Eleusinian Mysteries. It is thus possible that in Lykosoura a similar staged epiphany was employed in order to assert divine presence (as at Eleusis and perhaps Bassae),[116] whereby initiation experience was enhanced through the participating cosmos, reaffirming the mystery promises and the special relationship that was forged, to be maintained through renewed reciprocity.

THE SAMOTHRACIAN MYSTERIES

After Eleusis, the sanctuary of the Great Gods of Samothrace was the second most famous mystery cult in ancient Greece, but here – in a cult of non-Greek origin, as attested by the language used during initiation and in the written sources[117] – important cult elements elude us. Religious activity is recorded as far back as the seventh century BCE, but our knowledge of the initiation procedures is better documented for the later centuries. Upon arrival on the first day of initiation, visitors descended to the sanctuary and reached the so-called Theatral Circle. This was the first structure one came across after entering the sanctuary and it is believed to have been the earliest structure built, dating to the fifth century BCE.[118] The Theatral Circle is interestingly located both inside and outside the sanctuary: inside the *temenos* boundaries, but outside the sanctuary proper. The first stages of initiation probably took place here, after which initiates were led down the path to the main sanctuary.[119] These preliminary rites seem to have also involved the Korybantic rite of *thronosis* (enthronement), which, according to Strabo, included frenzied war-dances accompanied by loud music.[120] Such performances are fitting for the structure's small and circular layout with a central stage. Steps cut amphitheatrically in the natural rock extend 360° across the circumference of the central podium (Figure 64).[121] The ideal performances for this layout, which involved spectators positioned around the full circle of steps, are those incorporating circular movement (perhaps ritual dancing). It is believed that if *thronosis* was indeed one of these, the participants would have been placed in the centre of the Theatral Circle, while others watched on from the steps.[122] The structure is small and unroofed, and the lamp fragments recovered from the Circle's floor level attest to nocturnal performances, engulfed by the celestial dome, which provided the only shelter in this fully exposed space.[123] After the end of the performances in the Theatral Circle, initiates proceeded to the sanctuary's interior, moving north-west through the structure, which in its latest (Hellenistic) phase was a Doric *hexastyle prostyle* monument, adjacent to the Circle. With a north-west orientation, it was also architecturally different to its predecessor and had a different function; it was an exedra or pavilion.[124] This part of the sanctuary developed from an integrated passageway, distant but linked with the rest of the sanctuary, into an outward-facing, self-contained space in the later centuries.

Movement within a space is strongly influenced by access. Isolated spaces within a built environment are generally inaccessible, whilst other spaces encourage movement, or play the role of connecting areas, facilitating traffic flow.[125] By investigating the route visitors would have followed upon arriving at a sanctuary, it is possible to identify isolated areas or areas of heavy traffic. Due to the volume of material examined, it is not possible to present a detailed

64. Samothrace Sanctuary of the Great Gods Theatral Circle (photo by E. Boutsikas)

spatial syntax analysis of the sanctuary here and thus discussion on spatial movement is relatively superficial; but it contributes greatly to the discussion on the impact of the cognitive and physical environment on ritual experience, sensory context, and cognitive processes.

The main sanctuary unfolded gradually to the visitor, with sharp changes in altitude, tightly nested within a relatively narrow cleft in a craggy landscape, which allowed distant views to the sea. This kinaesthetic progression into the sanctuary formed an element of the visitor's initiation and psychological preparation, complementing the verbal and visual revelations, even if not formally structured in a specifically ritualistic manner.[126] Leaving the *prostyle* monument, the visitor descended north-west to the main sanctuary via means of the Sacred Way, which led to the north-east corner of the Hall of Choral Dancers (ca. 340 BCE). Evidence suggests that the carefully paved Sacred Way was sunk into the earth and was fenced on either side by a rubble and stone wall at least 1 m high.[127] The convoluted path of the Sacred Way visited at night, under the light of the moon with open flame torches aiding the procession but also creating deep shadows, took the initiates through a descent, disorienting them via changes in direction (by means of zigzags). In addition,

the path's width (varying from 2 to 12 m), as well as changes between sheltered and open spaces, assisted the cognitive processes of separation and transition. Moving downwards along the walled, meandering path at night, not knowing where it was leading, whilst mentally still processing the performances witnessed only a few minutes earlier in the Theatral Circle certainly had a strong psychological impact on the initiates. It cannot be doubted that the entire passage from the main entrance through to the Hall of Choral Dancers aimed to perceptually and psychologically prepare the initiates for entering the main sanctuary.[128] In Chapter 4 we explored a similar use of light-deprived descents at Didyma and Klaros, the latter involving also disorientation.[129] In the case of Eleusis, we saw that nocturnal disorientation was a fundamental element of the initiation. What we encounter at Samothrace, then, seems consistent for ancient Greek cult experience which involves divine relevations.

Three buildings have been linked to the three stages of Samothracian initiation: the *Hieron*, the *Anaktoron*, and the Hall of the Choral Dancers. The inscriptions found near the *Hieron* and the *Anaktoron* forbid entry to the uninitiated and demonstrate the existence of strict restrictions on movement within the sanctuary. In Kevin Clinton's view, these inscriptions were originally set further away from the buildings and functioned as boundary markers within the sanctuary, demarcating the point beyond which the uninitiated were not allowed to enter.[130] In any case, they stand as testimony to the sanctuary being revealed to visitors gradually, in several stages, following completion of preliminary initiation as a prerequisite. This means that the most sacred area of the sanctuary and the innermost cult structure, the *Hieron*,[131] could be only visited by *mystai*. This is the only building in the sanctuary that is architecturally comparable to a conventional temple, but even this structure does not fully conform to the ground plan of a standard Greek temple. It has a *bothros* in its apsidal south end, benches, and a hearth altar in the centre. It is likely that the *epopteia*, or a second stage of the initiation proper, was carried out in this structure.[132] The sacred way leads subsequently to the largest building in the sanctuary, the Hall of the Dancers. Everything about this structure shows its importance to the cult: its size, its location, the frieze depicting some 800 choral dancers, and its early date, which predates the *Hieron* and the Rotunda of Arsinoe (third century BCE).[133] The Hall has been identified as a place of main initiation and the location of the performance of the dance celebrating the divine wedding of Kadmos and Harmonia.[134] The number of buildings associated with initiation could give the impression that at Samothrace, initiation took place mostly indoors, but this does not seem to be as straightforward. Apart from the hypaethral Theatral Circle, there is also the monumental altar called Altar Court, approached through ascending stairs, located next to the *Hieron*,[135] and we know also that the search for Harmonia must have taken place outdoors.

The extant *Anaktoron* dates to the Roman period, but had two predecessors of similar design in the same area.[136] It was accessed from its long western side and its north part contains an *adyton*, a space with restricted entrance.[137] The benches along the *Anaktoron*'s east wall attest to its congregational function, but it is thought to have played no significant part in the ritual proceedings. Its marginal location has been taken as evidence that this is not a cult building.[138]

Elektra or Elektryone (the radiant one), daughter of Atlas, was the mistress of Samothrace and the mother of Dardanos, Eetion, and Harmonia, all fathered by Zeus.[139] Harmonia was sought for during the nocturnal search of the Samothracian Mysteries, drawing parallels with the Eleusinian search.[140] However, the names of the Samothracian gods given by Apollonius Rhodius in the third century BCE are all we can go by, at least for the earlier centuries: Axieros (Demeter), Axiokersa (Persephone), Axiokersos (Hades), and Kasmilos (Hermes).[141] The identity of the gods of Samothrace has also been linked with the Kabeiroi, along with other possible male divine groups such as the Korybantes and the Kouretes.[142] Unlike Eleusis, in Samothrace, the mysteries aimed at providing protection at sea,[143] as well as celebrating a divine union, as a late source discloses.[144] An inscription from Samothrace informs us that light also played an important role here. This stage has been associated with the Hall of the Choral Dancers.[145] Isidoros' epitaph not only confirms this, saying that the initiates of the nocturnal Samothracian Mysteries saw a sacred light, but he furthermore reveals that the Mysteries were concerned with the afterlife, to the extent that initiation may have guaranteed access to a privileged place in the underworld.[146] This idea, which, again, is comparable to the Eleusinian eschatological concerns, was dismissed until recently.[147] Yet, it finds support also in Dio Chrysostom's reference to the great impact of the *thronosis* on the initiate's understanding of the cosmos. More specifically, Dio asserts that the people dancing around the initiate led him or her to experience mystic things that revealed a deeper understanding of the cosmos during the *thronosis*, along with the other rites he or she experienced.[148] Similarly, the divine sexual union celebrated during the initiation also carried cosmic referents. Varro refers to this union as that of Earth and Sky, which he calls Dei Magni.[149] The two entwined snakes and two stars engraved on the Samothracian rings that the *mystai* took with them as token of their initiation indicate that such messages were of cosmological significance. Snakes were symbols of protection in ancient Greece, but we discussed in Chapter 5 that in certain contexts they also carried cosmological meaning, as in the examples of the Gigantomachy and Ophioneus.

Since initiation at Samothrace could be organised by arrangement, it lacked the time restrictions of the Eleusinian initiation. This flexibility is bound to complicate the task of identifying temporal elements that could have influenced the initiatory experience. The Roman *mystai* lists are the only extant

evidence allowing us to deduce that large-scale initiation took place at a certain period of the year. It probably lasted three days and took the form of an annual festival involving nocturnal initiation.[150] On the basis of the dates listed on the preserved Roman Samothracian *mystai* lists, the time of initiation – at least in the Roman period – is placed throughout the sailing season, between April and September. There is consensus based on literary material that there also existed a festival dedicated to the gods of Samothrace. Alternatively, this festival could have been the Dionysia, which also commemorated the myth of Dardanos and Eetion, and the wedding of Kadmos and Harmonia.[151] In the absence of firm evidence for the timing of the annual festival, the busiest months of the *mystai* lists have been interpreted as indicating when this took place. Susan Cole concludes that June was the time of the annual festival, because this month has the greatest number of inscriptions.[152] Nora Dimitrova argues, on the other hand, that document 103, which lists three consecutive days of initiation in June, does not necessarily imply a longer annual festival, but only the coincidence of three separate day-long events for initiation. Furthermore, the exclusive preference for June is contradicted by more recent epigraphical evidence, which makes September almost equally busy as June.[153] In favour of the June date is the estimation accepted by some scholars that the Argonauts in Apollonius' epic must have been initiated in June, and Apollonius would have chosen the most prestigious time for his heroes.[154]

The uncertainty that characterises our conclusions on this topic demonstrates the great insufficiency of our knowledge of the Samothracian proceedings. June is the month with the greatest number of records followed closely by September. The numbers of initiates for these two months are strikingly higher than the third busiest month, May, which has approximately half as many entries. The difficulties of converting the ancient Greek calendar to the Gregorian are considerably limited after the introduction of the Julian calendar in 46 BCE. If we convert the Julian dates from the *mystai* lists to the Gregorian dates, it transpires that the majority of the June *mystai* were initiated on 4, 5, 11, and 18 June between the first century BCE and first century CE.[155] This falls three weeks or fewer before the summer solstice (24–27 June).[156] During this time, the sun rises in the constellation of Gemini (between 21 May and 21 June), the Greek Dioskouroi, who were divinities associated with the Samothracian gods in literary sources, at least from the second century BCE.[157] Similarly, in the September *mystai* list, initiations between the first century BCE and first century CE took place between 30 August and 11 September and on 16 October (Gregorian dates),[158] within a month or less from the autumn equinox, and fewer than three weeks from the heliacal rising of Gemini (Table 6.3).[159]

Although these lists cover a short span of the history of the Mysteries and are late in date and incomplete, they do give us some information about the

TABLE 6.3. *The timing of the mysteries compared to the movement of the sun and Gemini. In the years 500–300 BCE the autumn equinox occurred on 1–2 October; the winter solstice 25–27 December; the spring equinox 22–23 March; and the summer solstice 28–29 June*

Attic months	Initiation times	Solar events (200 BCE–100 CE)	Movement of Gemini	Gregorian months
(1) Hekatombaion				July–August
Metageitnion	**Busiest initiation times** (30 Aug., 2–11 Sept.,			August–September
Boedromion	16 Oct.)	**Autumn equinox** (28–30 Sept.)		September–October
Pyanepsion			**Acronychal rising** (10–25 Nov.)	October–November
Maimakterion			**Cosmical setting** (4–18 Dec.)	November–December
Poseideon		**Winter solstice** (23–24 Dec.)		December–January
Gamelion				January–February
Anthesterion				February–March
Elaphebolion		**Spring equinox** (19–21 March)		March–April
Mounychion			**Heliacal setting** (6–18 May)	April–May
Thargelion	**Busiest initiation time** (4–18 June)		**Invisibility period** and *Sun rises in Gemini* (20 May–21 June)	May–June
Skirophorion		**Summer solstice** (24–27 June)	**Heliacal rising** (23 June–5 July)	June–July

busiest initiation periods: the times of the autumn equinox and the summer solstice and concurrent with the heliacal rising of Gemini. The equinoxes seem to have also played a role in Eleusis and perhaps in Lykosoura. A spatio-temporal analysis that examines the positioning of the structures used in the

stages of initiation reveals that the June solstitial occurrences could translate to an interesting initiation experience. All three main Samothracian structures were oriented W–NW. The Hall of the Dancers, the most central structure, believed to accommodate the most important stage of initiation,[160] is oriented at declination +32°, within 8° from the setting point of the sun on the summer solstice (+24°). It is also oriented within the range of the constellation of Gemini, which in 200 BCE was at declination +15° to +34° and rose heliacally during this time. The *Hieron*, used in the second stage of initiation according to Lehmann, is also oriented close to the constellation (dec. +45°), but the orientation of the *Hieron* and the *Anaktoron* cannot be linked with astronomical observations in June or September (Table 6.3). The general preference of all three structures for a western orientation is in contrast to those of the other mystery cult structures discussed in this chapter, which show preference for the opposite direction in their main entrances.

The importance of the sky, which Varro refers to as one of the Great Gods, can also be seen in the context of the experience of the Samothracian Mysteries. Initiation involved spiritual revelations resulting in the elevation of the soul to the heavens (as also in the case of Eleusis). This was perhaps symbolised in the ithyphallic *Anaktoron* statues, which had their hands outstretched towards the sky.[161] The gesture of these statues has been identified as a position symbolic of the enlightened man's elevation towards the sky.[162] As observed in the other mystery cults discussed in this chapter, it is possible that the light of the rising or setting sun during the times in the year which marked the transition of the seasons was used in the initiatory procedures to enhance the experience. In addition to the sun, the observation of the constellation of Gemini rising heliacally between 23 June and 5 July may have also been employed in the proceedings. Apart from the orientation of the Hall of the Choral Dancers, which is close to the constellation's declination, the two stars depicted in the Samothracian rings have been tentatively associated with the Dioskouroi.[163]

Experience of the Samothracian Mysteries was shaped by nocturnal ceremonies. These were accompanied by the flickering light of the torches, illuminating also the statues in the theatral area and those within the sanctuary, giving them a mystical – almost animated – appearance. It has been noted elsewhere that the shape of the Theatral Circle signified important spiritual associations and referents (the celestial dome, planets, sun, cosmos, etc.), thus leading to an experience that linked the participants on a physical and psychological level with the cosmos.[164] Once all stages of initiation were accomplished, initiates ended their visit by walking back through an eastward ascent to the entrance of the sanctuary, the *Propylon*, where their visit had commenced, thus completing a full circle. They returned to the first gateway they had entered after the preliminary ceremonies of the Theatral Circle.

This time they did not see the Ionic order on the *Propylon*, but a Corinthian one (the inward-facing façade). It is certain that the decision to employ two different orders for the two façades of the *Propylon* must have had some significance to the messages of the cult. The specific choice of the Corinthian architectural order with its acanthus leaves is viewed as a reference to cyclical death and rebirth following the mystery revelations.[165] We have seen that this aim was also fulfilled at Eleusis, observed in the natural cycle of the cosmos through the alternation of the seasons and the length of light and darkness marked by the motion of the sun and Persephone's annual transition from the Underworld.

DISCUSSION

The revelations of the ancient mysteries were said to forever change the lives of initiates but, in fact, ancient authors and modern scholars agree that initiates did not learn anything they did not already know.[166] Recent advances in cognitive science have much to offer to our understanding of the cognitive procedures involved in this type of cult. The model of 'predictive processing', in particular, illustrates how perceptions of events are not formed exclusively through optical receptors; we discussed in Chapter 2 that perception is not simply what we see. Taking perception as the result of a series of processes, which also incorporate individual expectations, imagination, and sensory information, is the most successful way to explain this seeming contradiction between the sources and mystery experience. Second-hand reference to Aristotle's opinion about the mysteries claims that he also believed their aim to be changing the initiates' mentality rather than teaching initiates something they did not know.[167] In the analysis of Apolline oracular consultation in Chapter 4, we discussed recent experimental research on the impact of individual beliefs and expectations in experiencing supernatural agency, particularly in low sensory reliability contexts, in environments with heavy demands on emotional regulations – such as, for example, the dark environment of the mystery cults and the blindfolding of the initiates.[168] Mystery cults employed these low sensory conditions in order for the initiates to arrive at the sought-after heightened emotional state which would facilitate the extraordinary experience of the revelations. Explicit references attest that at least in the later periods, this intention was common knowledge. For Strabo, writing in the first century BCE, the secrecy of the mysteries 'induces reverence for the divine, since it imitates the nature of the divine, which is to avoid being perceived by our human senses'.[169] We discussed the various cognitive props employed in order to achieve this, including the cosmological tenets. Internal cognitive processes combined with external stimulants and the context-specific memories of extended cognition – in short, the entire cognitive environment – were

responsible for forging the extraordinary experience. Part of this evidently also relied on the total physical environment. Pindar's word choice in relation to the mysteries is in my opinion an explicit statement that the ancients thought about these processes in a similar way. He says that the person who has 'seen' (ἰδών) the mysteries is happy.[170] It was the information conveyed in the lived 'visions' that the extended mind of the *mystes* processed after departing from the sanctuary. The important aspect of the mysteries was not the information they conveyed but, instead, the way and the context within which the revelations were communicated. Because the cognitive and experiential context of this process was the most impactful, the physical setting comprised of the land- and skyscape was paramount. The myths, metaphors, time, and space constituted the finely tuned 'instrument' of ancient mystery experience.

The need of ancient Greek (and indeed of any) religious ritual to achieve contact with divinity must have been even more pressing in mystery cults, given their particularly high reliance on participant emotionality and more so since the introduction of the eschatological concerns.[171] The appearance of the Eleusinian priestess dressed as Persephone attests to such intentions. Similar performances were also most likely witnessed in the Samothracian *dromena* and those of the Mysteries of Despoina, given that staging of sacred drama took place in all initiations.[172] In addition to these experiential props, the timing chosen for the rituals enhanced the intensity of this emotionality by conveying the sentiment of a participating cosmos. The symbolism of viewing, for example, the rising of the celestial Wheat, after the importance of the wheat was conveyed to the initiates and after a divine birth was interpreted as the arrival of the wheat, must have been complementary to the ritual symbolism. Similarly, seeing the first rays of the rising sun after experiencing a spiritual death and rebirth must have had some psychological impact. A late source, Valerius Flaccus, suggests as much when he says that the Minyae rejoiced in the new light of the sun and were full of heavenly visions departing from Samothrace.[173]

The importance of timing in ancient Greek ritual practice had become explicit by the second century CE, as witnessed in the Epidaurian inscription, which lists activities that had to be performed at a specific time (e.g., 'in the first hour') and at specific locations (e.g., 'in front of the front door').[174] These requirements denote not only careful planning and attention to detail, but also that such careful orchestration of these activities must be linked to the aims to be achieved. We saw a similar example in Kallimachos' *Partheneion* in Chapter 5. Reconstructions of ritual experience, focusing only on the rituals as facilitators of the mental, temporal, and spatial comprehension of the sacred space, at the expense of the architectural background, understate the importance of religious architecture in forging, negotiating, and propagating memories and experience. Ancient Greek monumental architecture shapes and

structures ritual space and movement within it, which, in turn, shapes experience and perception through the particular way a sanctuary reveals itself to the visitor. At the temple of Despoina in Lykosoura, the performance of the ordained actions by the priest standing in front of the south porch, imbedded architecture into the performance: it functioned here both as a stage and a backdrop, regardless of the time of day or night. Similarly, the experience of the first stage of Samothracian initiation would have been entirely different if the circular theatral area and the Doric hexastyle structure were absent. In this chapter, we added one further element to the cognitive ecology of mystery cults: the ability of religious architecture to project and guide vision towards specific sections of the night sky, which would enhance and heighten religious piety whilst bearing witness that the entire cosmos participated in these performances.

It is generally agreed that mystery cults played a cosmic role in ancient Greek belief. The deities linked to these cults must have also been associated, then, with cosmic order. In the *Homeric Hymn*, Persephone's cosmic role is unequivocal, as per Demeter's recounting of her daughter's annual transition between the two spheres.[175] This idea develops further in the Orphic tradition, where Persephone is associated with death and rebirth. Because Demeter's search ends at Eleusis, where she is reunited with her daughter, Eleusis becomes a location of cosmic significance in Greek conception. The three spheres (the underworld, the heavens, and the world of men) come together at Eleusis as the earth 'opens' to facilitate Persephone's return. The abduction and return of Persephone, like the abduction and return of Harmonia in Samothrace, upsets normality. In the human sphere, divine epiphany interrupts the natural world order. In Chapter 5 we observed that Athena's epiphany in *Erechtheus* circumvented the normal flow of the cosmos by transcending conventional mortal capabilities and assigning a cosmic role to an act of death. Epiphany creates alliances with the divine sphere, brings mythical time into the present, reaffirms current social order, and much more. It is natural then that the world cannot be the same after these events have come to pass.[176]

This chapter reveals the participation of the heavens in Greek mysteries as experienced through the movement of the sun, Spica, and Virgo in Eleusis, the sun and Gemini in Samothrace, and perhaps the sun also in Lykosoura. Through their selection as mystery initiation locations, these places became cosmological anchors, places of cosmic significance, legitimating an intimate relationship between the world of men (microcosm) and the universe (macrocosm). The idea of an interacting microcosm and macrocosm is much older than Demokritos, who may be credited with assigning 'microcosm' to the world of men. The inseparable link between man, nature, and the universe, the idea that common principles govern the order of both worlds, can be traced in Hesiod, Anaximenes, and the Pythagoreans.[177] The power of this

unity in these locations does not wear off, normality does not return, in the same way that Damophon's benefits do not cease even after Demeter's identity is revealed. Once the cosmic order is disturbed, normality cannot return even for the gods – Demeter has to accept the conditions of Persephone's return. Similarly, the extraordinary cosmic occurrence witnessed at Eleusis does not vanish; the initiates will return to their daily life after witnessing the mysteries, but will be accompanied by a new consciousness. This was also the case for spaces in ancient Greek thinking. Once touched by divinity, a place will retain this special relationship and status.

The esoteric message of mystery cults is the forging of a new order, particularly so for Eleusis. The mystery participants are introduced to this threefold order as an attempt to comprehend the structure and workings of the cosmos. During the Eleusinian Mysteries, more than the sacred drama of Demeter's search was re-enacted. The initiates experienced an epiphany (whether real or imagined)[178] of all three spheres during their initiation; hence the references to a near-death experience as an insight to the underworld. Persephone's descent is witnessed both through the symbolic death of the barren earth during Demeter's search and through the symbolic death of the initiates at the time of the autumn equinox, an important season marker in the sun's annual journey around the ecliptic. During this time, the sun starts to decline in daily altitude as it crosses back into the southern half of the ecliptic. For the next six months, darkness lasts longer than light and nature sinks into winter until Persephone's return at the other time in the year when the equal length of day and night is witnessed, the spring equinox (Lesser Mysteries). Now days become longer than the nights and the sun climbs higher, crossing the northern half of the ecliptic. The other important markers in the year, the solstices, may have also been of significance. We have seen that in Lykosoura the shortest day in the year (the winter solstice) – the time of the cosmos' midwinter renewal – became even shorter due to the high horizon, which made the sun set several hours earlier, while being aligned with the temple's south entrance. At Samothrace, inscriptional evidence from the later years of the sanctuary's operation demonstrates that more initiates visited the sanctuary near the time of the June summer solstice (the longest day in the year).

The suggestion of a correlation between the Mysteries and solar and stellar events should not come as a surprise. In the course of its annual journey, the sun defines and generates the seasons during its passage through the four evenly spaced temporal markers. Such associations have also been argued for the later Mysteries of Mithras, based on Porphyry's essay *On the Cave of the Nymphs*, where the four solar seasonal markers were associated with Mithraic deities: Mithras at the equinoxes and his torch bearers Cautes and Cautopates at the solstices.[179] The sanctuaries of ancient Greek mystery cults become pre-eminent spaces where people arrived annually, prepared to participate in an

extraordinary experience. The exceptional power of these spaces was complemented by a cosmic convergence. Moreover, in each sanctuary, the aetiology of the gathering was associated with divine suffering. At Eleusis, Demeter's promise to mankind for earth's fertility is linked to the change of the seasons heralded by the equinoxes, a time when day and night are equal, when the rotating cosmos is in balance.[180] Disruption is followed by order, facilitating stability in the structure of the universe. A cosmological profundity is forged.

SEVEN

EPILOGUE

In our quest for objective analysis and widely accepted models, it is easy to forget that culture is a human construct, a creature of its time and place. Thus in the study of religion in particular, literary and artefact analysis, which does not account for human interaction and experience, can only offer partial understanding. Three-dimensional reconstructions and visualisations of space are becoming more widespread, but they commonly omit half of what was visible – accurate representations of the sky. We neglect the decisive value of time, in the form of seasons, day, or night, in ancient experience. Who could argue that experiences and memories of a place, even of a structure, are identical at all times and in all weather conditions?

TIME, PLACE, EXPERIENCE

We explored ways in which religious space and ritual timing negotiated ideas of cosmology, ethnicity, and identity in ancient Greek cult practice. The pre-eminence of space in collective identity in the Greek world is well known. Ideas central to space syntax and relevant to the built environment and its potential become intelligible as awareness is created through spatial movement.[1] A number of studies have argued for the importance of the choice of specific spaces for ritual performance, a choice which needed to serve and facilitate the aims of the ritual. This need was pre-eminent in oracular and mystery sanctuaries, which required an altered state of consciousness, achieved

through sensory deprivation, a manipulated consciousness, or even the incorporation of geological conditions,[2] thus rendering location and architecture crucial. Furthermore, it has been argued that our concept of space needs to be extended to incorporate also the totality of physical and – admittedly much more challenging – imagined space in a given location, in conjunction with time. Ritual performance is as much about time as it is about place. The processions, ritual re-enactments, performances, etc. were all set up in this three-dimensional space, not separated from the time of the day or year when they were held. Thus, the idea that we can understand the meaning of a Greek religious festival by examining the 'triple code' of 'what is done', 'the heroes and gods honoured', and the tales or aetiological myths of the festival in question limits our understanding of these carefully staged, orchestrated events, which were physical but equally cognitive.[3] These three components are fundamental, but they alone are not sufficient to shape our understanding of ancient ritual experience. We can only minimise our distance from ancient experience of festivals if we recreate the 'total environment' encompassing the performed rituals. This means that in addition to Walter Burkert's three components, we should consider also the context of these rituals: their landscape, location and visibility within the sanctuary, and the timing in the day or night and in the year.

It follows that time and place are inseparable. We discussed in Chapter 1 that this relationship has been linked with the idea of the *chronotope*. A main aim of this volume has been to demonstrate that architecture, time, and place cannot be separated from experience. This book has argued for a basic schema of Greek religious practice: time, land-, and skyscape interact in ritual performance in order to create a cosmovision of the world, at the centre of which lies the ritual space from which emanates the performance. The cyclical time of calendric rituals is orchestrated. This time reflects the cycle of earthly human existence. Thus linear time (e.g., the mythical narratives explaining cosmogony, the establishment of cosmic order, foundation myths, etc.) is combined with the cyclical time of repeated ritual; blended together, they become present time in ritual performance. During the performance of religious ritual, as human bodily perception places us in the centre, we become the focal point of the cosmic structure – even more so when this takes place outdoors. This sense of our centrality is demonstrated, for example, in the way we talk about the sun. Our language still pretends that the sun moves around us: the sun rises and sets. In this notion of the centrality of our place, architecture does not simply shape but also transforms this experience.[4] The case studies examined here demonstrate that focusing on linking direct structural alignments with specific astronomical targets from the available mantle of stars makes us susceptible to overlooking other contextual evidence about Greek cult practice, structures, and the cosmos. For example, we have seen that the altars and

temples of Artemis Orthia and the Parthenon are oriented within the solar rising arc. It could suffice then to simply stress that these orientations support the general conclusion of a large number of Greek temples being oriented to the east, but, as has become apparent, such a general statement misses out on a much more impressive and complex cosmic occurrence.

Monumental architecture makes a discernible statement about the world views of its builders, a statement commonly maintained in subsequent building phases. The commemoration of myths and display of performances surrounded by cleverly constructed architecture, during appropriately timed rituals, succeeds in using the predictive element of astronomical knowledge in the creation of impressive visions of an almost palpable display of the cosmos. Klaus Junker has convincingly shown that mythical and real worlds were combined in Greek iconographic representations.[5] These interpretations are based on the observer's experiences and on memory. But comprehending contact with the divine using words is as difficult as discussing a dream. Despite the descriptor's tendency to exaggerate their experiences,[6] it is impossible to understand an individual experience affected by an unending multitude of factors such as psychology, emotional state, personal experiences, memories, etc. The neurological process is very similar to the way fantasies are constructed, the only difference being, as we discussed, that the process is reversed: images in this case are constructed in the brain and move towards the eyes. What neuroscience teaches us is that there is nothing objective about the way we perceive the world, as indeed about most things we think we know.

The aim of this volume has been to demonstrate that the inclusion of the total physical and cognitive environment is imperative for our understanding of Greek religious practice. This enriched methodology moves forward from the isolated study of structures and belief systems, in the same way that we, today, do not experience a place isolated from its surroundings, weather, light, scale, etc. Experience is not a rational or objective process, but without these elements we cannot understand a great deal about the function of ritual, belief, and practice. As discussed throughout this volume, it is acknowledged that such contextual cognitive information is not always available. In the case of Dreros, for example, we have not been able to make as much progress as in Eleusis, Sparta, or Athens. Similarly, the discussions on Bassae, Messene, and Samothrace have much potential, but we can only proceed with caution in terms of how far we can take the astronomical correlations. Our task in interpreting these statements of ancient world views is less straightforward and significantly complicated, as it must reveal and balance scales, symbols, patterns, meanings, interplays, narratives, emotions, politics, etc. And all this is accompanied by a complex web of endless versions of memories. It cannot be refuted, for example, that the use of the two 'extreme' orders (in terms of decoration or lack of it) on the two sides of the Samothracian *Propylon*, or the

combination of three orders in the temple of Apollo in Bassae, must have had symbolic significance.[7] In addition, experience of architecture is also reliant on 'time, motion and sensory perception'.[8] The stories narrated within these cognitive and physical environments resulted in the autobiographical experience of formidable events on one level, and on another, they were interwoven in the 'mesh of interrelations' of a network forging context-specific identities, relationships, and experiences.[9] In this way, the network becomes much more than the physical environment. Astronomy, time, the seasons, and katasterism myths become an integral and subtle part of this powerful network – a part which perhaps instils messages and experiences subconsciously in some cases, but which nevertheless is always present in the embodied memories of these events. We are called to understand the real and mythical spheres in unison.

Whether these meanings were understood by all or only by a select few is unknowable. But so are the meanings and messages passed on in rituals and doctrines. Experience and understanding of meanings and their extent lies with each individual. The images of the moving bodies of the dancing girls at the altar of Orthia within the set environment incorporated also the backdrop of the rising Pleiades moving across the sky. All this was regulated by verbal recitations, and thus orchestrated a kinaesthetic audio-visual experience of myth, the present, and the cosmos. We do not know if all Spartan spectators gathered at the sanctuary of Artemis Orthia saw the rising Pleiades as the celestial representation of the performance they had just witnessed at the altar of Orthia. It is not possible to know whether, or how many, Athenians linked Draco with the cosmological undertones and myths associated with the Panathenaia, or understood the Hyades as the daughters of Kekrops rising in front of the Great Altar at the time of the Arrephoria. But archaeoastronomy allows us to reveal what was there to be seen. The links were there for those able to make these cognitive leaps along with the interpretations they assigned to these occurrences. It is very likely that at least some participants would have made these observations. Unlike architecture, the experience of these astronomical observations was 'opportunistic'. They were there only for a few minutes. But by their mere presence they made experience of the sacred extraordinary. A finely tuned mechanism comprised of topography, time, place, architecture, space, cult, and myth, fully unravelled once a year, during the special occasion that assigned meaning to it – when the cosmos did make sense. Without one of these components, this cosmic experience would vanish.

Was it also a numinous experience? One could argue possibly yes, as is every encounter with the divine. But even if we remain sceptical, even if nothing metaphysical was seen in the cosmos participating in these rituals, if ritual was seen simply as a political construct, in Jonathan Smith's terms,[10] could we deny

that observing appropriately linked key celestial figures at the time of ritual performance reaffirmed these connections, even if just mythological, or at the very least calendrical? If ritual was indeed just such a political construct and these astronomical connections served to do nothing more than tap memory, or act as purely 'historical' narratives of a distant past, would this make the observations less important? Was this not so brilliantly achieved in the Parthenon's sculptural decoration? If we are so willing to accept ancient Greek use of religious architecture in propaganda, in forging and promoting identity, and in facilitating memory, why could the timing of religious festivals not have been used to enhance these aims through the addition of another dimension? Let us not forget that all this was taking place at a time when people gazed at the night sky with the same frequency we fix our eyes on digital technology.

SHARED EXPERIENCE AND THE CREATION OF MEMORIES

Religion as 'a shared language' facilitating communication of the experience of the cosmos between participants was complemented by polis religion,[11] which added the necessary historic context. In the previous chapters we added a further element to this experience, that which engulfs the ritual proceedings in real and cosmic time. This multidimensional *language* of Greek religion created a *readable* and structured cosmos, which made sense. By visually imbedding cosmic time in the ritual performance through the astronomical referents discussed, this *language* negotiated the role of ritual performance in the macrocosm. Place, ritual time, and mythical re-enactments in unison can be seen as the agents of this communication. This process involved the forging of 'long-term, sensorial and mnemonic history' as defined by Hamilakis in his examination of monumentality and ceremony in palatial Crete.[12] Of course, experience occurs on an individual scale. In group rituals, all participants witness the same events and performances concurrently, but the way this information is processed, including its effects and emotional impact, remains individual. As a result, it is misguided to deny the plurality of group experience. More so if we consider that the impact of experience is felt only after it has ended and that experience is a mental process which develops through time. What may occur collectively is perhaps the process of memory evocation through performance, gestures, spoken words, setting, atmosphere, etc., which shapes individual memories. Ritual narratives negotiate spatial correspondences in their creation of memories. This can be vividly experienced in the episodes described in the Hellenistic Salmacis epigram, for instance, which articulates a constellation of spatial correspondences between different places of memory.[13] We have already explored the ability of memory places to be material and immaterial. They can be real and imagined.

Individual and collective memories can be viewed as a means of knitting societies together. I hope to have shown ways in which the powerful tool called ritual – part of the equally powerful cultural institution called religion[14] – can be combined with cognitive and material props to enable those who know how to use it to manipulate the human nervous system,[15] induce minds to supernatural beliefs, and stimulate the sense of communication with the divine. We explored in Chapters 4 and 6 how predictive processing is argued to assist the human mind in perceiving supernatural presence even when none is there.[16] In short, I have argued for the ability of embodied, carefully orchestrated ritual staging to direct and control human mind.[17] Anthropological research on autobiographical memories of participation in high-arousal rituals has recorded the impressive changes of memories through time. Within two months of the rituals, a noted change in the memories has been recorded, with factual details increasing, but also a significant increase in confidence and errors. It has been concluded that participation in high-arousal rituals does not 'necessarily result in detailed and vivid flashbulb memories', probably because of a form of stress-induced amnesia.[18] The two-month change of memories demonstrates that memory formation is not an instant process, but instead a much more complicated, individual, and interpretative cognitive process which requires time to formulate and settle. This demonstrates clearly the individuality and high degree of subjectivity of autobiographical memories, which, at least in the context of ancient Greek festivals, operated across multiple levels, integrating neural, bodily, cognitive, affective, institutional, and social processes.

Each collective ritual had its very own cognitive ecology,[19] susceptible to temporal, social and cultural parameters. These processes constructed memories, which were on one hand individual and based on perception, but on the other were also negotiated by cultural and social schemas. For example, memories of the procession from the Delphinion in Miletos to the oracle of Apollo in Didyma during the new year festival of Apollo would have been a shared experience, influenced by socio-political constructs, with an additional individual autobiographical version of the event, different for each participant. The individual autobiographical elements of each person's memory of the procession embellish the common, shared memory of the procession instead of detracting from it. It is of course not possible to access these detailed autobiographical elements in order to reconstruct the memories of the event for a single individual, but we are in a position to make inferences about festival experience by reconstructing a nexus of smells, visual encounters, and emotions emerging during the known elements of festivals. The cognitive environment responsible for shaping the content and expression of the memories gained can be thus partly reconstructed. This leads to better understanding the emotional experience as witnessed by the

senses. In turn, modern academic discourse is performing the very acts of mnemonic formations that ancient Greek religious institutions achieved. By creating narratives of how concepts like memories, identity, and ethnicity were established in ancient societies, we create memory discourse of current academic and general understanding of the structure, ideals, and symbols of these societies for modern-day cultures. We confront and deconstruct past behavioural patterns, only to create more faithful reconstructions as a means of making sense of ancient societies. Although detached from the societies under investigation, in this process, we become an extension of ancient Greek mnemonics.

We usually place memory in the head; we often think of emotions as deriving from the heart, and reaction from the gut. Through this process, the entirety of the physical body is integrated into memorisation. Pontus Hellström's characterisation of the sanctuary of Zeus in Labraunda (Asia Minor) as a 'memory theatre' because of the constant reminders of the power of the Hekatomnids and Zeus appears to apply also to the examples presented in this volume.[20] A 'memory theatre' which includes a sanctuary with its surrounding skyscape. A 'memory theatre' which exemplifies the power of ritual. Ritual proceedings cannot be seen as more significant than architecture in the cognitive comprehension of time and sacred space, as has been argued.[21] We have seen that architecture shapes space and, along with space, it shapes experience and perception. When the priest stood at the side porch of the temple of Despoina in Lykosoura, architecture transformed into the stage and backdrop of the performance. Similarly, when the priestess of Demeter emerged at the end of the search for Persephone during the Eleusinian Mysteries, a comparable staging took place at the Ploutonion. Architecture was imbedded in ritual experience. In Bassae, the impact of sacred experience would be fundamentally different without the east entrance of Apollo's temple, and so on; we explored similar practices in Samothrace, the oracle of Apollo in Didyma and Klaros, and the Athenian Acropolis. The rituals presented show that the topography and architecture of a number of sanctuaries, combined with the timing of the rituals, made explicit to participants the essence and functioning of the cosmos and their role within it. Through carefully staged architecture and precisely timed performances, ritual experience reached immense sensorial heights.

In later years, the use of props to enhance religious experience and emotionality became more explicit. A specially designed corpus of machinery and devices was created for this purpose. Heron of Alexandria is the most celebrated ambassador of this technology.[22] But even before Heron, Claudine Leduc reminds us that despite poetry being less explicit, a poet's audience anticipated metaphoric and enigmatic language.[23]

RITUAL MNEMONICS AND ASTRONOMY AS EDUCATIONAL PROPS

I aimed to demonstrate that the dynamics of spatial movement and the mediums which convert a random resource (e.g., ritual objects) to a mnemonic, individualised, and entrenched resource,[24] along with the temporal staging of ritual performance, are capable of enhancing our understanding of memory and identity (be it ethnic, individual, social, etc.). Identity is forged through a sense of the past. This sense can be comprehended through traditions, which, as discussed in the case of Messene, may be invented and reinvented depending on ethnic needs. This (re)invention of the past involves interpretation and we have observed the eminence of ritual in such processes. The repetitiveness of ritual activities renders them particularly suitable for such constructs. The tradition and invariance which ritual emanates satisfies the human sense of belonging. In addition, since ritual performance can assign meaning to a place, memories and meanings merge in sacred locations and engage with the ascribed sense of a place, which is also the product of sensorial experience.[25] John Sutton *et al.* discuss the ways in which 'cultural and intergenerational pathways' involved in collective activities are developed. Agents become skilled experts in the use of such resources 'by way of sustained apprenticeship'.[26] This can be achieved either through repetition, which ensures that the agent memorises the pathways, or through the development of individual mechanisms which enable the agent to recall the information. For Kim Sterelny, these 'cumulatively built, collectively provided tools for thinking' are 'the most critical, mind-and-brain-shaping environmental supports for cognition'.[27] It is here that exploring the multidimensional space of agent–environment interaction becomes the most important tool in our research, because this environment is responsible for amplifying or transforming cognitive capacities and practices.[28] The tradition and formality claimed by ancient Greek rituals were devised mechanisms which enabled remembering.

The pedagogic function of myth is widely accepted.[29] This function is complemented by repetition, which is linked to memory. The astronomical correlations outlined in the cases of Athens, Sparta, and mystery cults are suitable examples of what Pierre Bourdieu calls *explicit pedagogy*.[30] Bourdieu's idea makes use of objects and places as 'mnemonic pegs' which facilitate the narration of stories capable of explaining events of the past as relevant in present social life. This mechanism educates members of a society on the meaning of specific places and things.[31] The astronomical links and relevant myths associated with the Panathenaia, Arrephoria, and *Partheneion* are examples of 'mnemonic pegs' facilitating education by triggering memory. It is safe to conclude that these occurrences, which combined astronomical targets with festivals and civic life, operated also as implicit pedagogic actions,

impacting human cognition. This conclusion finds support also in Bourdieu's discussion of habitus, which considers the role of places and objects as mediums of shaping human cognition,[32] and the emphasis he places on the importance of space in implicit pedagogy. In Bourdieu's view, the body *hexis* which directly communicates with motor function (e.g., gestures, posture), particularly in children, impacts cognition without going through discourse or consciousness.[33] Symbolic gestures or words observed during ancient Greek festivals facilitated implicit and explicit forms of education.[34] This can be more clearly observed in festivals addressing pubescent boys and girls at the turning point of their status, marked through the performance of initiatory rites, such as the Arrephoria and the *Partheneion* ritual. I suggest that the rituals and their associated astronomical links functioned not only as an educational prop, but also as a mnemonic device, which offered necessary stimulants, triggering memories of a common mythical past and strengthening collective identity.

Performance invades and structures space. Movements impose the presence of the body within this space, and through the re-enactment of myth, mythical time becomes present, integrating the body within cosmic space. Thus, a dialogue is created between the human and divine realms. At the same time, if remembering is also a process of re-experiencing past events,[35] there is no reason why this should not apply also to myth. Ritual performance allows participants to understand the broader cosmological significance of primordial battles and mythical narratives (e.g., aetiological myths), to situate them within the wider framework of identity, and to learn 'history'. The Gigantomachy, in particular, portrays Athena emerging victorious from violence and primitiveness, in a similar manner the Classical Acropolis portrays her children emerging victorious from the Persian encounter. In human and divine 'history' violence was a recurring theme and the narrations linked with the canopy of stars were not excluded from this norm.

What I have tried to instil in this volume is the idea that ancient religious experience operated on a number of levels and involved a number of processes. Each festival participation was unique, as it was carried out at a different site in a different setting, and each festival experience involved not just the senses, but also the entire cosmos, both real and imaginary. The approach I present is not argued to be universal. Perhaps certain cults made more intensive use of the constructed cognitive environment than others. Similarly, the multiplicity of agents means that not everyone had the same experience, such as those too young to perceive all the messages; others, with poor vision, perhaps unable to observe the astronomy; *xenoi* who perhaps may not have known fully the mythological contexts and connotations; some who may not have felt this religious intensity to the extent described here; those uninterested or distracted, etc. But is this not also the case in many modern

religious performances today? The cognitive system was there, with the potential to fully unravel for those able to perceive it. Religious spaces were vibrant arenas of shared experience of the cosmos.

The study of ancient Greek cult practice requires a multifaceted approach which does not simply focus on one type of evidence. I hope to have made a strong case in support of this statement.

APPENDIX

LIST OF STRUCTURES. IN GREY ARE WESTERN ORIENTATIONS.

	Location	Site	Structure	Date	Deity	Latitude	Longitude	Dec.
1.	Acheron	Oracle of the dead	Main sanctuary	Hellenistic	Hades	39° 14' 13"	20° 32' 05"	+53° 21'
2.	Aegina	Sanctuary of Aphaia	Temple of Aphaia	Archaic	Aphaia	37° 45' 19"	23° 32' 2"	+18° 39'
3.	Agrigento	Valley of temples	Temple of Hera (D)	Classical	Hera	37° 17' 19"	13° 36' 01"	+5° 57'
4.	Agrigento	Valley of temples	Temple of Concordia (F)	Classical	Concordia	37° 17′ 23"	13° 35' 32"	+1° 30'
5.	Agrigento	Valley of temples	Temple of Herakles (A)	Archaic	Herakles	37° 17' 25"	13° 35' 11"	+1° 30'
6.	Agrigento	Valley of temples	Temple of Olympian Zeus (B)	Classical	Zeus	37° 17' 27"	13° 35' 4"	+11° 41'
7.	Agrigento	Sanctuary of Chthonic deities	Temple of Dioskouroi (I)	Classical	Dioskouroi	37° 17' 29"	13° 34' 53"	+7° 52'
8.	Agrigento	Sanctuary of Chthonic deities	Temple L	Classical	Demeter?	37° 17' 57"	13° 36' 12"	+11° 22'
9.	Agrigento	Sanctuary of Chthonic deities	Tempietto 1	Classical	unknown	37° 17' 27"	13° 34' 53"	+11° 46'
10.	Agrigento	Sanctuary of Chthonic deities	Tempietto 2	Classical	unknown	37° 17' 27"	13° 34' 53"	+54° 59'
11.	Agrigento	Sanctuary of Chthonic deities	Tempietto 3	Classical	unknown	37° 17' 27"	13° 34' 53"	−11° 08'
12.	Agrigento	Sanctuary of Chthonic deities	Recinto 2	Classical	unknown	37° 17' 27"	13° 34' 53"	−0° 33'
13.	Amathous	Acropolis	Temple of Aphrodite	Roman	Aphrodite	34° 42' 51"	33° 08' 25"	−32° 08'
14.	Amathous	Acropolis	Small Roman temple & Hellenistic temple	Roman & Hellenistic	unknown	34° 42' 51"	33° 08' 26"	−32° 30'
15.	Amphipolis	Sanctuary of Attis	Temple of Attis	Hellenistic	Attis	40° 49' 23"	23° 50' 20"	−6° 04'
16.	Amphipolis	Thesmophorion	Thesmophorion/Nymphaion	Classical	Demeter?	40° 49' 45"	23° 50' 44"	−36° 31'
17.	Amphipolis	Sanctuary of Kleio	Temple of Kleio	Classical	Kleio	40° 49' 33"	23° 50' 32"	−43° 48'
18.	Argos	Heraion	Old Temple	Geometric	Hera	37° 42' 00"	22° 46' 56"	−19° 12'
19.	Argos	Heraion	New Temple	Classical	Hera	37° 41' 58"	22° 46' 52"	−19° 56'
20.	Athens	Acropolis	Archaios Naos	Archaic	Athena	37° 58' 18"	23° 43' 33"	+10° 13'
21.	Athens	Acropolis	Parthenon	Classical	Athena	37° 58' 21"	23° 43' 40"	+11° 13'
22.	Athens	Acropolis	Temple Athena Polias	Classical	Athena	37° 58' 23"	23° 43' 38"	+5° 48'
23.	Athens	Acropolis	Erechtheion	Classical	Erechtheas	37° 58' 24"	23° 43' 37"	+54° 15'
24.	Athens	Agora	Temple Apollo Patroos	Classical	Apollo	37° 58' 36"	23° 43' 22"	−5° 19'
25.	Athens	Agora	Temple Zeus & Athena Phratria	Classical	Zeus & Athena	37° 58' 36"	23° 43' 22"	−4° 33'
26.	Athens	Agora	Hephaisteion	Classical	Hephaistos	37° 58' 36"	23° 43' 20"	−8° 6'
27.	Athens	Agora	Stoa of Zeus Eleutherios	Classical	Zeus	37° 58' 37"	23° 43' 22"	−9° 28'
28.	Athens	South slope	Old temple of Dionysos	Archaic	Dionysos	37° 58' 16"	23° 43' 42"	+13° 25'
29.	Athens	South slope	New temple of Dionysos	Classical	Dionysos	37° 58' 15"	23° 43' 42"	+14° 28'
30.	Athens	Agora	Metroon	Hellenistic	Mother of Gods	37° 58' 34"	23° 43' 22"	−6° 43'

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	Location	Site	Structure	Date	Deity	Latitude	Longitude	Dec.
31.	Bassae	Sanctuary of Apollo	Temple of Apollo Epikourios	Classical	Apollo	37° 25' 47"	21° 54' 01"	+66° 20'
32.	Bassae	Sanctuary of Apollo	Temple of Apollo (side entrance)	Classical	Apollo	37° 25' 47"	21° 54' 01"	−2° 37'
33.	Delos	Sanctuary of Apollo	Letoon	Archaic	Leto	37° 24' 10"	25° 16' 03"	−51° 38'
34.	Delos	Sanctuary of Apollo	Stoa (portico) of Antigonos	Hellenistic	Apollo	37° 24' 08"	25° 16' 03"	−51° 30'
35.	Delos	Sanctuary of Apollo	Artemision	Mycenaean	unknown	37° 24' 07"	25° 16' 01"	−49° 32'
36.	Delos	Sanctuary of Apollo	Artemision	Archaic	Artemis	37° 24' 07"	25° 16' 01"	−12° 37'
37.	Delos	Sanctuary of Apollo	Artemision	Hellenistic	Artemis	37° 24' 07"	25° 16' 01"	−12° 37'
38.	Delos	Sanctuary of Apollo	Horn temple	Classical	Apollo	37° 24' 01"	25° 16' 00"	+7° 52'
39.	Delos	Sanctuary of Apollo	*Oikos* of Naxians	Archaic	Apollo	37° 24' 01"	25° 16' 00"	−8° 57'
40.	Delos	Sanctuary of Apollo	*Oikos* of Naxians (back entrance)	Archaic	Apollo	37° 24' 01"	25° 16' 00"	+10° 00'
41.	Delos	Sanctuary of Apollo	*Oikos* of Naxians (side entrance)	Archaic	Apollo	37° 24' 01"	25° 16' 00"	+52° 53'
42.	Delos	Sanctuary of Apollo	Poros temple of Apollo	Archaic	Apollo	37° 24' 06"	25° 16' 03"	−4° 12'
43.	Delos	Sanctuary of Apollo	Temple of Athenians of Apollo	Classical	Apollo	37° 24' 06"	25° 16' 03"	−5° 23'
44.	Delos	Sanctuary of Apollo	Great temple of Apollo	Classical	Apollo	37° 24' 05"	25° 16' 03"	−4° 59'
45.	Delos	Sanctuary of Apollo	Archigesion	Archaic	Anios	37° 24' 18"	25° 16' 16"	−6° 47'
46.	Delos	Sanctuary of Mt Kynthnos	Temple Zeus Hypsistos	Hellenistic	Zeus	37° 23' 45"	25° 16' 28"	+12° 27'
47.	Delos	Sanctuary of Mt Kynthnos	Sanctuary of Artemis Lochia, Herakles-Baal Zeboul, gods of Askalon	Classical	Artemis	37° 23' 48"	25° 16' 26"	-52° 55'
48.	Delos	Sanctuary of Mt Kynthnos	Sanctuary of Artemis Lochia, Herakles-Baal Zeboul, gods of Askalon	Classical	Gods of Askalon Herakles-Baal Zeboul	37° 23' 48"	25° 16' 26"	+3° 28'
49.	Delos	Sanctuary of Mt Kynthnos	Sanctuary of Agathe Tyche	Hellenistic	Tyche	37° 23' 51"	25° 16' 20"	−3° 22'
50.	Delos	Sanctuary of foreign gods	Heraion	Archaic	Hera	37° 23' 53"	25° 16' 18"	−45° 8'
51.	Delos	Sanctuary of foreign gods	Heraion	Geometric	Hera	37° 23' 53"	25° 16' 18"	−45° 8'
52.	Delos	Sanctuary of foreign gods	Serapeion C	Hellenistic	Serapis	37° 23' 54"	25° 16' 16"	−50° 52'
53.	Delos	Sanctuary of foreign gods	Temple of Isis	Hellenistic	Isis	37° 23' 54"	25° 16' 07"	−1° 47'
54.	Delos	Sanctuary of foreign gods	Temple of Anubis, Serapis, & Isis	Hellenistic	Anubis, Serapis, & Isis	37° 23' 54"	25° 16' 07"	−1° 47'
55.	Delos	Sanctuary of foreign gods	Samothrakeion	Classical–Hellenistic	Kabeiroi (assoc. Dioskouroi)	37° 23' 55"	25° 16' 12"	−0° 43'
56.	Delos	Sanctuary of foreign gods	Monument of Mithridates	Hellenistic	Mithridates	37° 23" 54"	25° 16' 12"	−42° 06'
57.	Delos	Sanctuary of foreign gods	Serapeion A	Hellenistic	Serapis	37° 23' 57"	25° 16' 12"	+22° 24'
58.	Delos	Sanctuary of foreign gods	Sanctuary of Syrian gods	Hellenistic	Atargatis/Astarte-Aphrodite	37° 23' 58"	25° 16' 17"	+2° 11'

59.	Delos	Establishment of Poseidoniasts	Temple of Poseidon-Baal	Hellenistic	Poseidon-Baal	37° 24' 15"	25° 16' 03"	+4° 59'
60.	Delos	Establishment of Poseidoniasts	Temple of Astarte	Hellenistic	Astarte	37° 24' 15"	25° 16' 03"	+4° 59'
61.	Delos	Theatre district	Aphrodision	Hellenistic	Aphrodite	37 °23' 57"	25° 16' 7"	−42° 48'
62.	Delos	Sanctuary of Apollo	Temple Γ	Geometric	Apollo	37° 24' 05"	25° 16' 02"	+52° 24'
63.	Delos	Sanctuary of Apollo	Dodekatheon	Hellenistic	12 Olympians	37° 24' 08"	25° 15' 57"	−3° 42'
64.	Delphi	Sanctuary of Athena Pronaia	New temple of Athena Pronaia	Classical	Athena	38° 28' 52"	22° 30' 30"	−46° 59'
65.	Delphi	Sanctuary of Athena Pronaia	Old Temple of Athena Pronaia	Archaic	Athena	38° 28' 52"	22° 30' 33"	−45° 7'
66.	Delphi	Sanctuary of Apollo	Temple of Apollo	Archaic	Apollo	38° 28' 56"	22° 30' 03"	+47° 38'
67.	Delphi	Sanctuary of Apollo	Temple of Apollo	Classical	Apollo	38° 28' 56"	22° 30' 03"	+47° 38'
68.	Didyma	Oracle of Apollo	Temple of Apollo	Archaic	Apollo	37° 23' 05"	27° 15' 22"	+32° 56'
69.	Didyma	Oracle of Apollo	Temple of Apollo	Hellenistic	Apollo	37° 23' 06'	27° 15' 24"	+32° 27'
70.	Dion	Sanctuary of Isis	Temple of Isis	Roman	Isis	40° 10' 38"	22° 29' 45"	+13° 40'
71.	Dion	Sanctuary of Isis	Temple of Hypolympidia Aphrodite	Roman	Aphrodite	40° 10' 37"	22° 29' 45"	+13° 40'
72.	Dion	Sanctuary of Demeter	Temple A	Archaic–early Classical	Demeter	40° 10' 34"	22° 29' 40"	+19° 2'
73.	Dion	Sanctuary of Demeter	Temple 1	Hellenistic	Demeter	40° 10' 34"	22° 29' 40"	+14° 37'
74.	Dion	Sanctuary of Demeter	Temple B	Archaic–early Classical	Demeter	40° 10' 38"	22° 29' 40"	+8° 37'
75.	Dion	Sanctuary of Demeter	Temple 2	Hellenistic	Demeter	40° 10' 38"	22° 29' 40"	+13° 52'
76.	Dion	Sanctuary of Demeter	Small temple with offering table	Hellenistic	Demeter	40° 10' 35"	22° 29' 40"	+21° 12'
77.	Dion	Temple of Zeus	Temple of Zeus Hypsistos	Roman	Zeus	40° 10' 37"	22° 29' 43"	−40° 32'
78.	Dodona	Oracle of Zeus	Temple of Aphrodite (L)	Hellenistic	Aphrodite	39° 32' 52"	20° 47' 25"	−14° 15'
79.	Dodona	Oracle of Zeus	Temple of Themis (Z)	Hellenistic	Themis	39° 32' 53"	20° 47' 25"	−23° 51'
80.	Dodona	Oracle of Zeus	Temple of Zeus (*hieri oikia*) (E1)	Hellenistic	Zeus	39° 32' 54"	20° 47' 26"	−20° 50'
81.	Dodona	Oracle of Zeus	New temple of Dione (Q)	Hellenistic	Dione	39° 32' 54"	20° 47' 26"	−9° 56'
82.	Dodona	Oracle of Zeus	Old temple of Dione (G)	Classical	Dione	39° 32' 54"	20° 47' 26"	−38° 23'
83.	Dodona	Oracle of Zeus	Temple of Herakles	Hellenistic	Herakles	39° 32' 54"	20° 47' 27"	−42° 35'
84.	Dreros	Ancient Dreros	Temple of Apollo Delphinios	Geometric	Apollo	35° 15' 56"	25° 37' 57"	+48° 34'
85.	Eleusis	Sanctuary Demeter & Kore	Megaron	Mycenaean	*megaron*	38° 2' 31"	23° 32' 21"	−15° 27'
86.	Eleusis	Sanctuary Demeter & Kore	Telesterion-Solonion	Archaic	Demeter & Kore	38° 2' 31"	23° 32' 21"	+48° 46'
87.	Eleusis	Sanctuary Demeter & Kore	Telesterion-Peisistratid	Archaic	Demeter & Kore	38° 2' 31"	23° 32' 21"	−18° 06'
88.	Eleusis	Sanctuary Demeter & Kore	Telesterion-Periklean	Classical	Demeter & Kore	38° 2' 31"	23° 32' 21"	−17° 38'
89.	Eleusis	Sanctuary Demeter & Kore	Telesterion (side entrance)	Classical	Demeter & Kore	38° 2' 31"	23° 32' 21"	+49° 19'
90.	Eleusis	Sanctuary Demeter & Kore	Telesterion (side entrance)	Classical	Demeter & Kore	38° 2' 31"	23° 32' 21"	−44° 28'
91.	Eleusis	Sanctuary Demeter & Kore	Ploutonion	Archaic	Hades	38° 2' 33"	23° 32' 21"	−9° 18'

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	Location	Site	Structure	Date	Deity	Latitude	Longitude	Dec.
92.	Englianos	Nestor's Palace	*Hiero – Athena Potnia Ippia*	Mycenaean	Athena	37° 01' 38"	21° 41′ 43"	−40° 28"
93.	Englianos	Nestor's Palace	*Megaron*	Mycenaean	*megaron*	37° 01' 39"	21° 41' 42"	−39° 36'
94.	Ephesos	Upper Agora	Temple of Isis	Hellenistic	Isis	37° 56' 23"	27° 20' 27"	−5° 12'
95.	Ephesos	Vicinity of upper Agora	Temple of Serapis	Roman	Serapis	37° 56' 23"	27° 20' 21"	+51° 27'
96.	Ephesos	Sanctuary of Artemis	Temple of Artemis	Geometric	Artemis	37° 56' 59"	27° 21' 50"	+12° 10'
97.	Ephesos	Sanctuary of Artemis	Temple of Artemis	Archaic	Artemis	37° 56' 59"	27° 21' 50"	+12° 10'
98.	Ephesos	Sanctuary of Artemis	Temple of Artemis	Hellenistic	Artemis	37° 56' 59"	27° 21' 50"	+12° 10'
99.	Gortyn	Asklepieion	Temple of Asklepios	Classical	Asklepios	37° 32' 45"	22° 02' 76"	−1° 29'
100.	Himera	Sanctuary of Athena	Temple C	Archaic	unknown	37° 58' 15"	13° 49' 23"	+17° 56'
101.	Himera	Sanctuary of Athena	Naiskos A	Archaic	unknown	37° 58' 15"	13° 49' 23"	+17° 56'
102.	Himera	Sanctuary of Athena	Temple B	Archaic	unknown	37° 58' 15"	13° 49' 23"	+18° 42'
103.	Himera	Sanctuary of Athena	Altar of temple B	Archaic	unknown	37° 58' 15"	13° 49' 23"	+16° 47'
104.	Himera	Sanctuary of Athena	Temple D	Archaic	unknown	37° 58' 15"	13° 49' 23"	+8° 11'
105.	Himera	Sanctuary of Athena	Temple of Victory	Classical	Victory	37° 58′ 26"	13° 49′ 26"	+15° 38'
106.	Isthmia	Sanctuary of Poseidon	Old temple of Poseidon	Archaic	Poseidon	37° 55' 0"	22° 59' 61"	−6° 35'
107.	Isthmia	Sanctuary of Poseidon	New temple of Poseidon	Classical	Poseidon	37° 55' 0"	22° 59' 61"	−5° 49'
108.	Kalydon	Ancient Kalydon	Temple of Apollo	Archaic	Apollo	38° 22' 22"	21° 31' 50"	−29° 4'
109.	Kalydon	Ancient Kalydon	Heroon of Leon of Kalydon	Hellenistic	Leon (hero)	38° 22' 25"	21° 32' 02"	−51° 36'
110.	Kalydon	Ancient Kalydon	Temple of Artemis	Classical	Artemis	38° 22 '23"	21° 31' 50"	−22° 34'
111.	Klaros	Oracle of Apollo	Temple of Apollo	Hellenistic	Apollo	38° 00' 18"	27° 11' 35"	−4° 27'
112.	Klaros	Oracle of Apollo	Altar of Apollo	Hellenistic	Apollo	38° 00' 17"	27° 11' 37"	−5° 12'
113.	Klaros	Oracle of Apollo	Temple of Artemis	Hellenistic	Artemis	38° 00' 18"	27° 11' 36"	−6° 43'
114.	Klaros	Oracle of Apollo	Altar of Artemis	Hellenistic	Artemis	38° 00' 18"	27° 11' 37"	−7° 26'
115.	Klaros	Oracle of Apollo	Altar of Artemis	Archaic	Artemis	38° 00' 18"	27° 11' 37"	−6° 43'
116.	Korinth	Agora	Temple of Apollo	Archaic	Apollo	37° 54' 44"	22° 52' 82"	+12° 25'
117.	Kos	Asklepieion	Large Doric temple of Asklepios	Hellenistic	Asklepios	36° 52' 35"	27° 15' 26"	+46° 47'
118.	Kos	Asklepieion	Prostyle Ionic temple of Asklepios	Hellenistic	Asklepios	36° 52' 36"	27° 15' 27"	−18° 13'
119.	Kos	Asklepieion	Altar of Asklepios	Hellenistic	Asklepios	36° 52' 36"	27° 15' 27"	−18° 13'
120.	Kos	Agora-Limenas	Temple of Pandemos Potnia Aphrodite	Hellenistic	Aphrodite	36° 53' 41"	27° 17' 28"	+50° 45'
121.	Kos	Agora-Limenas	Hellenistic temple	Hellenistic	unknown	36° 53' 42"	21° 17' 29"	+50° 45'
122.	Kos	Agora-Limenas	Temple of Herakles	Hellenistic	Herakles	36° 53' 41"	27° 17' 30"	+52° 29'
123.	Kourion	Sanctuary of Apollo Hylates	Temple of Apollo	Roman	Apollo	34° 40' 25"	32° 51' 49"	−54° 19'

124.	Lebadeia	Sanctuary of Zeus Basileus	Temple of Zeus Basileus	Hellenistic	Zeus	38° 25' 54"	22° 51' 52"	+19° 42'
125.	Lemnos	Sanctuary Artemis Selene	NW room with benches	Archaic	Artemis	39° 53' 37"	25° 03' 44"	−15° 34'
126.	Lemnos	Sanctuary Artemis Selene	Main *temenos*	Archaic	Artemis	39° 53' 37"	25° 03' 44"	+33° 19'
127.	Lemnos	Theatre of Hephaistia	Theatre temple with altar	Archaic	Great Goddess?	39° 57' 53"	25° 19' 06"	−29° 42'
128.	Lemnos	Sanctuary of Great Goddess	Temple of Great Goddess	Archaic	Great Goddess	40° 01' 20"	25° 22' 37"	−28° 22'
129.	Lemnos	Kabeirion	Archaic Telesterion	Archaic	Kabeiroi	39° 58' 44"	25° 20' 30"	−25° 32'
130.	Lemnos	Kabeirion	Hellenistic Telesterion	Hellenistic	Kabeiroi	39° 58' 45"	25° 20' 30"	−36° 24'
131.	Lykosoura	Sanctuary of Despoina	Temple of Despoina	Hellenistic	Despoina	37° 23' 23"	22° 01' 52"	−0° 21'
132.	Lykosoura	Sanctuary of Despoina	Temple of Despoina (side entrance)	Hellenistic	Despoina	37° 23' 23"	22° 01' 52"	−21° 37'
133.	Magnesia	Sanctuary of Zeus	Temple of Zeus Sosipolis	Hellenistic	Zeus	37° 51' 10"	27° 31' 36"	+1° 56'
134.	Magnesia	Temple of Artemis	Temple of Artemis Leukophryne	Hellenistic	Artemis	37° 51' 12"	27° 31' 38"	−11° 56'
135.	Mantineia	Agora	Temple 2b	Roman	Euphrosynos & Epigone	37° 37' 15"	22° 23' 36"	+1° 45'
136.	Mantineia	Agora	Temple of Hera	Hellenistic	Hera	37° 37' 39"	22° 25' 27"	+2° 32'
137.	Mantineia	Agora	Temple 2g	Roman	Euphrosynos & Epigone	37° 37' 16"	22° 23' 60"	+1° 45'
138.	Mantineia	Agora	Podareion	Hellenistic	Podaris	37° 37' 16"	22° 23' 06"	+8° 03'
139.	Megalopolis	Agora	Temple of Zeus Soter	Classical	Zeus	37° 24' 84"	22° 07' 66"	−5° 53'
140.	Megara Hyblaea	City	Temple D	Classical	unknown	37 12' 14"	15° 10' 55"	−4° 01'
141.	Messene	Sanctuary Asklepios	Temple Asklepios	Hellenistic	Asklepios	37° 10' 32"	21° 55' 13"	−12° 16'
142.	Messene	Sanctuary Asklepios	Temple Artemis Orthia	Classical	Artemis	37° 10' 33"	21° 55' 12"	−22° 00'
143.	Messene	Sanctuary Asklepios	Altar of Artemis Orthia Phosphoros	Hellenistic	Artemis	37° 10' 32"	21° 55' 12"	−12° 16'
144.	Messene	Sanctuary Asklepios	Temple Artemis Orthia Phosphoros	Hellenistic	Artemis	37° 10' 32"	21° 55' 12"	−12° 16'
145.	Messene	Sanctuary Asklepios	Hierothysion	Hellenistic	12 Olympians	37° 10' 30"	21° 55' 13"	−40° 27'
146.	Miletos	Agora	Delphinion	Classical on Archaic foundations	Apollo	37° 31' 48"	27° 16' 51"	−16° 25'
147.	Miletos	Agora	Altar of Delphinion	Classical on Archaic foundations	Apollo	37° 31' 48"	27° 16' 51"	−14° 00'
148.	Miletos	Agora	Temple Dionysos	Hellenistic	Dionysos	37° 31' 47"	27° 16' 41"	−15° 35'
149.	Miletos	Agora	Temple of Demeter	Hellenistic	Demeter	37° 32' 09"	27° 17' 02"	−17° 2'
150.	Miletos	Agora	Serapeion	Roman	Serapis	37° 31' 41"	27° 16' 40"	−42° 19'
151.	Miletos	Agora	Temple of Athena (early)	Archaic	Athena	37° 31' 41"	27° 16' 18"	−11° 10'

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	Location	Site	Structure	Date	Deity	Latitude	Longitude	Dec.
152.	Miletos	Agora	Temple of Athena	Archaic	Athena	37° 31' 42"	27° 16' 18"	−45° 10'
153.	Miletos	Agora	Temple of Artemis	Archaic	Artemis	37° 31' 14"	27° 16' 02"	−0° 4'
154.	Monodendri	Altar of Poseidon	Altar of Poseidon	Archaic	Poseidon	37° 21' 14"	27° 11' 32"	−7° 39'
155.	Naxos	Sagri	Temple of Demeter	Archaic	Demeter	37° 01' 49"	25° 25' 54"	−42° 23'
156.	Naxos	City	Temple of Apollo Portara	Archaic	Apollo	37° 06' 40"	25° 22' 23"	−38° 14'
157.	Naxos	Sanctuary of Dionysos	Temple Dionysos	Geometric	Dionysos	37° 04' 43"	25° 22' 53"	−40° 54'
158.	Naxos	Sanctuary of Dionysos	Temple of Dionysos (early)	Archaic	Dionysos	37° 04' 43"	25° 22' 53"	−43° 46'
159.	Naxos	Sanctuary of Dionysos	Temple of Dionysos	Archaic	Dionysos	37° 04' 43"	25° 22' 53"	−44° 11'
160.	Nemea	Sanctuary of Zeus	Temple of Zeus	Classical	Zeus	37° 48' 63"	22° 42' 66"	+16° 8'
161.	Nemea	Sanctuary of Zeus	Temple of Zeus	Archaic	Zeus	37° 48' 63"	22° 42' 66"	+16° 8'
162.	Olympia	Sanctuary of Zeus	Temple of Zeus	Classical	Zeus	37° 38' 20"	21° 37' 51"	+7° 28'
163.	Olympia	Sanctuary of Zeus	Heraion	Archaic	Hera	37° 38' 24"	21° 37' 51"	+3° 39'
164.	Olympia	Sanctuary of Zeus	Pelopeion	Classical	Pelops	37° 38' 22"	21° 37' 50"	−42° 8'
165.	Olympia	Sanctuary of Zeus	Bouleuterion	Archaic	Zeus-Horkios	37° 38' 10"	21° 37' 53"	+14° 34'
166.	Orchomenos	Upper city Agora	Temple of Artemis Mesopolitis	Hellenistic	Artemis	37° 43' 46"	22° 18' 94"	+27° 23'
167.	Palaipaphos	Sanctuary of Aphrodite	Temple of Aphrodite	Roman	Aphrodite	34° 42' 26"	32° 34' 26"	−16° 13'
168.	Pella	Thesophorion	Thesmophorion (entrance 2)	Classical	Demeter	40° 45' 52"	22° 31' 41"	−0° 15'
169.	Pella	Thesophorion	Thesmophorion (entrance 1)	Classical	Demeter	40° 45' 52"	22° 31' 41"	+4° 47'
170.	Perachora	Heraion	Temple of Hera Limenia	Geometric	Hera	38° 01' 67"	22° 51' 27"	+61° 33'
171.	Perachora	Heraion	Temple of Hera Akraia	Archaic	Hera	38° 01' 75"	22° 51' 18"	+3° 50'
172.	Pergamon	Serapeion	Temple of Serapis	Roman	Serapis	39° 07' 19"	27° 10' 58"	+18° 43'
173.	Pergamon	Acropolis	Temple of Athena	Hellenistic	Athena	39° 07' 54"	27° 11' 02"	−44° 19'
174.	Pergamon	Acropolis	Temple of Dionysos	Hellenistic	Dionysos	39° 07' 56"	27° 10' 57"	−46° 46'
175.	Pergamon	Acropolis	Great altar of Zeus	Hellenistic	Zeus	39° 07' 51"	27° 11' 03"	−3° 47'
176.	Poros	Sanctuary Poseidon	Temple of Poseidon	Archaic	Poseidon	37 °31' 26"	23° 28' 51"	+18° 17'
177.	Poros	Sanctuary Poseidon	Building D	Hellenistic	Poseidon	37° 31' 23"	23° 28' 50"	+46° 06'
178.	Priene	Agora	*Hieri* stoa	Hellenistic	stoa	37° 39' 32"	27° 17' 54"	−52° 55'
179.	Priene	Sanctuary of Zeus	Temple of Zeus	Hellenistic	Asklepios or Zeus	37° 39' 31"	27° 17' 53"	+1° 36'
180.	Priene	Sanctuary of Athena	Temple of Athena Polias	Classical	Athena	37° 39' 33"	27° 17' 46"	+1° 43'
181.	Priene	Sanctuary of Demeter	Temple of Demeter	Classical–Hellenistic	Demeter	37° 39' 39"	27° 17' 46"	+4° 18'
182.	Priene	Sanctuary Egyptian Gods	Temple of Egyptian Gods	Hellenistic	Egyptian Gods	37° 39' 34"	27° 17' 57"	+62° 15'
183.	Rhodes	Kameiros	Temple of Pythian Apollo	Hellenistic	Apollo	36°20' 17"	27° 55' 17"	+53° 36'
184.	Rhodes	Kameiros	Temple of Athena Kameiras	Hellenistic	Athena	36° 20' 10"	27° 55' 17"	+9° 12'
185.	Rhodes	Ialyssos	Temple Athena Polias	Hellenistic	Athena	36° 24' 00"	28° 08' 40"	−53° 57'

186.	Rhodes	Lindos, Acropolis	Temple of Lindia Athena	Archaic	Athena	36° 05' 31"	28° 05' 19"	+41° 21'
187.	Rhodes	Lindos, Acropolis	Temple of Lindia Athena	Hellenistic	Athena	36° 05' 31"	28° 05' 19"	+41° 21'
188.	Rhodes	City of Rhodes	Temple of Aphrodite	Hellenistic	Aphrodite	36° 26' 49"	28° 13' 40"	−3° 10'
189.	Rhodes	Theologos	Temple of Erethimios Apollo	Classical	Apollo	36° 22' 33"	28° 01' 52"	+26° 34'
190.	Rhodes	Acropolis-Monte Smith	Temple of Pythian Apollo	Hellenistic	Apollo	36° 26' 28"	28° 12' 40"	−3° 58'
191.	Rhodes	Acropolis-Monte Smith	Temple of Artemis	Hellenistic	Artemis	36° 26' 28"	28° 12' 41"	−3° 10'
192.	Rhodes	Acropolis-Monte Smith	Temple of Athena Polias & Zeus Polieus	Hellenistic	Athena & Zeus	36° 26' 42"	28° 12' 43"	+10° 50'
193.	Samos	Heraion	Great temple of Hera	Archaic	Hera	37° 40' 22"	26° 53' 10"	+8° 47'
194.	Samos	Heraion	Hekatompedon I	Geometric	Hera	37° 40' 23"	26° 53' 12"	+9° 57'
195.	Samos	Heraion	Rhoecus temple	Archaic	Hera	37° 40' 22"	26° 53' 10"	+8° 47'
196.	Samos	Heraion	Hekatompedon II	Archaic	Hera	37° 40' 23"	26° 53' 12"	+8° 47'
197.	Samothrace	Sanctuary of Great Gods	*Orthostate* structure	Classical	Great Gods & Kabeiroi	40° 30' 04"	25° 31' 48"	+11° 15'
198.	Samothrace	Sanctuary of Great Gods	*Anaktoron*	Roman	Great Gods & Kabeiroi	40°30' 05"	25° 31' 48"	−17° 5'
199.	Samothrace	Sanctuary of Great Gods	Hall of Choral Dancers	Classical	Great Gods & Kabeiroi	40° 30' 03"	25° 31' 49"	+31° 30'
200.	Samothrace	Sanctuary of Great Gods	*Hieron*	Hellenistic	Great Gods & Kabeiroi	40° 30' 01"	25° 31' 49"	+45° 28'
201.	Samothrace	Sanctuary of Great Gods	Altar Court	Hellenistic	Great Gods & Kabeiroi	40° 30' 03"	25° 31' 49"	+23° 18'
202.	Santorini	Ancient Thera	Shrine of Artemidoros of Perge	Hellenistic	Zeus, Apollo, Kabeiroi, (Poseidon)	36° 21' 52"	25° 28' 41"	+28° 18'
203.	Santorini	Ancient Thera	Temple of Pythios Apollo	Hellenistic	Apollo	36° 21' 48"	25° 28' 41"	+30° 44'
204.	Santorini	Ancient Thera	Temple of Anubis, Serapis, & Isis	Hellenistic	Anubis, Serapis, & Isis	36° 21' 47"	25° 28' 40"	−42° 42'
205.	Santorini	Ancient Thera	Temple of Karneios Apollo	Archaic	Apollo	36° 21' 47"	25° 28' 43"	+38° 30'
206.	Segesta	Segesta	Doric temple	Classical	unknown	37° 56′ 29"	12° 49′ 56"	+7° 37'
207.	Selinous	Sanctuary of Demeter Malophoros	*Megaron* of Demeter Malophoros	Archaic	Demeter	37° 35′ 13"	12° 49′ 03"	+21° 58'
208.	Selinous	Sanctuary of Demeter Malophoros	Altar of Demeter Malophoros	Archaic	Demeter	37° 35′ 13"	12° 49′ 03"	+23° 28'
209.	Selinous	Sanctuary of Demeter Malophoros	Temple of Zeus	Archaic	Zeus Meilichios	37° 35′ 13"	12° 49′ 03"	+31° 37'
210.	Selinous	Sanctuary of Demeter Malophoros	*Megaron*	Archaic	Demeter	37° 35′ 13"	12° 49′ 03"	−03° 45'

(continued)

(continued)

	Location	Site	Structure	Date	Deity	Latitude	Longitude	Dec.
211.	Selinous	Sanctuary of Demeter Malophoros	Hekataion	Archaic	Hekate	37° 35′ 13”	12° 49′ 03”	+33° 04’
212.	Selinous	Acropolis	Temple of Hera	Archaic	Hera	37° 35′ 12”	12° 50′ 05“	+02° 14’
213.	Selinous	Acropolis	Temple C	Archaic	Apollo?	37° 34’ 60”	12° 49’ 31”	−2° 58’
214.	Selinous	Acropolis	Temple D	Archaic	unknown	37° 34’ 60”	12° 49’ 31”	−3° 03’
215.	Selinous	Acropolis	Altar of temple. D	Archaic	unknown	37° 34’ 60”	12° 49’ 31”	−8° 30’
216.	Selinous	Acropolis	Temple A	Classical	Leda & Artemis?	37° 34’ 60”	12° 49’ 31”	−5° 20’
217.	Selinous	East hill	Temple E	Classical	Hera	37° 35’ 06”	12° 50’ 09”	−4° 37’
218.	Selinous	East hill	Temple F	Archaic	unknown	37° 35’ 14”	12° 50’ 06”	−3° 26’
219.	Selinous	East hill	Temple G	Archaic	unknown	37° 35’ 14”	12° 50’ 06”	−3° 26’
220.	Sikyon	Agora	Temple of Artemis Limnaia or Apollo	Archaic	Artemis or Apollo	37° 59’ 10”	22° 42’ 85”	−2° 49’
221.	Sikyon	Agora	Temple Artemis Limnaia or Apollo	Hellenistic	Artemis or Apollo	37° 59’ 10”	22° 42’ 85”	−2° 49’
222.	Sounio	Sanctuary Poseidon	Temple of Poseidon	Classical	Poseidon	37° 39’ 04”	24° 01’ 30”	−11° 37’
223.	Sounio	Sanctuary Poseidon	Great temple of Athena	Archaic	Athena	37° 39’ 14”	24° 01’ 40”	−6° 31’
224.	Sounio	Sanctuary Poseidon	Small temple of Athena	Classical	Athena	37° 39’ 15”	24° 00’ 41”	−10° 3’
225.	Sparta	Sanctuary of Artemis Orthia	Temple of Artemis Orthia	Archaic	Artemis	37° 05’ 03”	22° 26’ 15”	−5° 52’
226.	Sparta	Sanctuary of Artemis Orthia	Early temple of Artemis Orthia	Geometric	Artemis	37° 05’ 03”	22° 26’ 15”	−0° 44’
227.	Sparta	Sanctuary of Artemis Orthia	Altar of Artemis Orthia	Archaic & Classical	Artemis	37° 05’ 03”	22° 26’ 15”	+13° 27’
228.	Sparta	Therapni, Menelaion	Sanctuary of Menelaos & Helen	Archaic	Menelaos & Helen	37° 04’ 00”	22° 27’ 00”	−45° 10’
229.	Sparta	Therapni, Menelaion	Sanctuary of Menelaos & Helen	Classical	Menelaos & Helen	37° 04’ 00”	22° 27’ 00”	−45° 10’
230.	Sparta	Therapni, Menelaion	Mycenaean building	Mycenaean	*megaron*	37° 04’ 00”	22° 27’ 00”	−14° 04’
231.	Tegea	Temple of Athena Alea	Temple of Athena	Classical	Athena Alea	37° 27’ 39”	22° 25’ 27”	+5° 29’
232.	Tegea	Temple of Athena Alea	Temple of Athena (side entrance)	Classical	Athena Alea	37° 27’ 39”	22° 25’ 27”	+55° 11’
233.	Thermon	Ancient Thermon	Temple of Apollo Thermios	Archaic	Apollo	38° 33’ 39”	21° 40’ 08”	−45° 26’
234.	Thermon	Ancient Thermon	*Megaron* A	Mycenaean	*megaron*	38° 33’ 39”	21° 40’ 08”	−44° 44’
235.	Thermon	Ancient Thermon	*Megaron* B	Geometric	*megaron*-religious	38° 33’ 39”	21° 40’ 08”	−45° 9’
236.	Thespies	Valley of the Muses	Altar of Muses	Hellenistic	Muses	38° 18′ 00”	23°10′ 00”	−3° 30’
237.	Tinos	Sanctuary Poseidon & Amphitite	Building B	Classical	Poseidon	37° 33’ 11”	25° 08’ 33”	−50° 56’
238.	Tinos	Sanctuary Poseidon & Amphitrite	Temple of Poseidon	Hellenistic	Poseidon	37° 33’ 11”	25° 08’ 33”	+5° 05’
239.	Tiryns	Palace	Temple of Hera	Geometric	Hera	37° 36’ 00”	22° 48’ 06”	−50° 42’
240.	Tiryns	Palace	*Megaron*	Mycenaean	*megaron*	37° 36’ 00”	22° 48’ 06”	−50° 42’

GLOSSARY

Acronychal rising (apparent): The last visible rising of a star in the evening twilight. On the following evening, the star will rise while there is still too much daylight for it to be seen.

***Adyton*:** The innermost room of the temple's *sekos*. The word is used to describe a variety of spaces, so the *adyton* did not denote a specific architectural form, but rather a space that, as its name signifies, was 'not to be entered'. Access to the *adyton w*as restricted. The chamber was accessible from the *sekos*, but visually separated from it.

Altitude: [T]he vertical angle between a given direction – such as the direction toward a particular point on the horizon from a given place – and the horizontal plane through the observer. A positive altitude indicates that the point being observed is above the observer; if it is below, then the altitude will be negative. Thus the altitude of a horizon point level with the observer is 0°. That of the summit of a high or nearby hill might be as much as 5° or 10°, but that of a sea horizon viewed from a high place might be −0.5° or −1°.

(Ruggles 2005a: 8–9)

Atmospheric extinction: The amount of reduction of a celestial object's visibility/brightness caused by the thickness of the atmosphere. Extinction is relative to the celestial object's altitude above the horizon, the air's transparency, and the observer's elevation above sea level. The lower the altitude of a star, the denser the atmosphere and thus the harder it is to see the star. This is why there is a time lapse between the actual and the visible (apparent) rising or setting of a star. For Greece, the altitude considered safe for a star's visibility above the horizon (taking also into account atmospheric refraction) is approximately 4°.

Atmospheric refraction: The bending of a star's light caused by the thickness and change in temperature of the atmosphere at low altitudes.

Axial precession: The gradual change of the position of the stars (declination) over the course of centuries caused by the movement of the earth's axis. The most obvious effect of this shift is the change in the North Star. Today, Polaris is the star closest to

the celestial sphere's due north point, but in 3,000 BCE Thuban was the North Star. Polaris will be the North Star again in 25,800 years, the time the earth's axis takes to complete a full circle (for more details on this see Magli 2016: 16–19; Ruggles 2005a: 345–7). This effect results in a gradual shift in the declination of stars in the celestial sphere over several centuries, meaning that the declinations of the stars observed in ancient Greece were different to their declinations today.

Azimuth: The bearing of a point in the horizon from a given location measured clockwise from true north (as opposed to magnetic north) in a horizontal plane. Thus the azimuth of due north is 0° and 360°, that of due east is 90°, that of due south 180°, etc.

Circumpolar constellations and stars: Located close to the north celestial pole (the concept also applies for the south celestial pole), these do not wander in the night sky. Their movement is circular, rotating counter-clockwise around the north celestial pole. They are never seen to rise or set, but rather to culminate.

Cosmical setting (apparent): The first visible setting of a star or small constellation in the west approximately an hour before sunrise, while the sky is still dark enough. This occurs annually on the same day and lasts one or two days, as the star sets below the horizon a few minutes earlier every day.

Culmination: The moment at which a celestial body reaches the highest altitude above the horizon, when it crosses the observer's meridian. For circumpolar stars, upper culmination is the moment when they most closely approach the observer's zenith, and lower culmination is the moment when they are the farthest from the zenith and the closest to the nadir.

Declination: The angular distance between a celestial object and the celestial equator. Declination is essentially 'latitude' on the celestial sphere, which, from a fixed point on the earth, can be imagined as spinning around on its axis once a day with the stars affixed to it (only the upper half being visible above the local horizon at any given time). Thus declination is the exact point on the celestial sphere where a star is located. This position is fixed and changes only in response to axial precession. The declination of a structure is the projection of the structure's orientation on the celestial sphere; in other words, the conversion of a structure's azimuth into celestial coordinates. This is deduced by taking into account the structure's azimuth, the local horizon's altitude, atmospheric refraction, and extinction. Calculating the declination of a structure makes it easy for us to see which astronomical bodies rise and set in this part of the celestial sphere at a given time.

Heliacal rising (apparent): The first appearance of a star or small constellation after its invisibility period, when it was either hidden below the horizon or had been rising during the day. During its heliacal rising, the star or constellation is seen to rise above the horizon before the morning twilight, while it is still dark enough to be seen. A few minutes later, the light of the rising sun, which moves faster, hides the star. This first visibility of the star in the pre-dawn sky occurs every year on the same day. The next day, the star or constellation rises above the horizon a few minutes earlier. So by the time the sun's glare washes the sky, the star has managed to climb a little higher in the sky than the previous day.

Heliacal setting (apparent): The last visible setting of a star approximately one hour after sunset, in the evening twilight. On the previous night, the star set below the horizon while there was still too much sunlight for it to be seen. The heliacal setting is the last annual appearance of the star, followed by a period of invisibility, which will end with the star's reappearance in the sky just before dawn during its heliacal rising.

Lunar standstills: The extreme positions of the moon in the horizon. These are divided into major and minor standstills in order to describe the closest north and south positions of the moon from the equator (minor lunar standstills) and the farthest north and south positions of the moon from the equator (major lunar standstills). A major lunar standstill takes place every 18.6 years, with a minor lunar standstill occurring 9.3 years later. For more information on this and how the concept may be relevant to ancient cultures, see González-García (2016); Magli (2016: 19–21).

***Opisthodomos*:** The rear chamber of a temple, literally meaning 'the room behind'. It was set against the back wall of the *sekos* and resembled the *pronaos*, matching its dimension and layout. Architecturally, it served to balance the temple's design, giving symmetry to its plan. The function of the *opisthodomos* is uncertain. It could be an inner room, sometimes used as a treasury, or the back porch of the temple.

***Parapegma* (pl. *parapegmata*):** Stone stelae inscribed with star names and their phases, such as first and last appearances of stars, or solar events. They were used for predictions of astronomical events, corresponding weather predictions, or even astrological predictions in the Roman period. Next to each entry, the *parapegma* has a hole, in which a peg was inserted in order to mark the appropriate day in the year. *Parapegmata* were displayed in public areas. We also have written *parapegmata*, which transfer these astronomical observations from stone to papyrus.

***Pronaos*:** The front porch of a temple, immediately in front of the *sekos*. An open room, formed by projecting the side walls of

the *sekos* forward and being enclosed at the front by a portico. It functioned as the transitional and protecting space between the outside and the *sekos*, its depth and number of columns varying according to the temple's plan.

***Sekos*:** The main rectangular chamber of the temple entered through the temple's main entrance, flanked by the *pronaos* at the front and *opisthodomos* at the back. It contained the cult image of the deity to which the temple was dedicated, as well as votive offerings. In the Roman period, it was called *cella*.

Solar arc: Marks the path in the horizon which the sun traces during its rising and setting in the year. For the latitude of Greece, the declination range of the solar arc extends between declinations $-23^\circ\ 45'$ and $+23^\circ\ 45'$. The extremities of this space mark the points in the horizon where the sun is seen to rise and set at the solstices. Halfway between these points are the parts of the horizon that the sun visits at the equinoxes (declination 0°).

NOTES

CHAPTER 1

1 For Holl, 'natural light, with its ethereal variety of change, fundamentally orchestrates the intensities of architecture' (1994: 22).
2 For modern examples of this see Ebbensgaard 2014: 9; Morris 2011: 322, 335.
3 As defined in Hamilakis 2014: 157.
4 On this consult Koslofsky 2011.
5 E.g., Ebbensgaard 2014; Edensor 2013, 2016.
6 Ruggles 2005a: xxii.
7 Much more progress in this field has been achieved in recent years for the Roman world. See, e.g., Aveni and Romano 2000; Bertarione and Magli 2015; Hannah and Magli 2011; Rodríguez-Antón *et al.* 2018.
8 Ruggles 2005a: xxiii.
9 E.g., navigation in Homer (*Odyssey* 5.270–8), agricultural practices as exemplified in Hesiod's *Works and Days*, etc.
10 E.g., Astyanax is likened in the *Iliad* to a 'lovely star', 6.401; Quintilian, *Institutio Oratoria* 1.4.4.
11 Thucydides, *History of the Peloponnesian War* 2.78.2.
12 Hippocrates, *Peri aeron, hydaton, topon* 2.11–26.
13 *Oedipus Tyrannus* 1135–9.
14 See, e.g., Fontenrose 1959: 434; Harrison 1912: 331. 'Myth might be defined as a narrative which is considered socially important, and is told in such a way as to allow the entire social collective to share a sense of this importance' (Csapo 2005: 9).
15 Csapo 2005: 134.
16 Cf. Berger 1967: 27–8; 'Die Welt last sich als "Welt", als "Kosmos" insofern fassen, als sie sich als heilige Welt offenbart'(Eliade 1984: 38).
17 *Frag.* 1.119, cf. Kirk *et al.* 2007: 54, 56.
18 Kirk *et al.* 2007: 54–5.
19 *Laws* 7.809c–d. Trans. Jowett, B. 1953. *The Dialogues of Plato*. Vol. 4. 4th ed. Oxford: Clarendon Press.
20 Taub 2003: 25.
21 col.v, col.xii, col.v, col.xiii, respectively. *Parapegma* first published by Grenfell and Hunt 1906. The numbering provided here follows Lehoux 2007: 217–23.
22 To Ares on 1 March, the date of the launching of Isis' boat on 9 March, the Egyptian New Year, and the Roman 'New Year' on 23 September (Lehoux 2007: 153–4, 164).
23 Gibbs 1976: 240; Hannah 2009: 122–5; Theodossiou *et al.* 2010.
24 Gibbs 1976: 270.
25 Hannah 2009: 96, 127.
26 Theodossiou *et al.* 2010: 166. These instruments developed early. Anaximander is linked with their earliest forms in the Greek space in the sixth century BCE (Diogenes Laertius, DK 12A1(1)), but the Mesopotamian upright *gnomon* is considered a simplified and earlier type of a sundial, which had been used several centuries before Anaximander's time (Couprie 2011: 28–9). What may be the earliest stone sundial was discovered recently in the Valley of the Kings and dates to the thirteenth century BCE (Bickel and Gautschy 2014). The water clock was also used by the Egyptians as early as the fourteenth century BCE (Couprie 2011: 25–6).
27 Suda, sv Προηροσίαι (π 2420 Adler); Hesychios sv Προηροσία = Klei(to)demos of Athens, *FGrH* 323 F 23, with Jacoby's commentary; Robertson 1996a. For a number of examples demonstrating the importance of performing religious activities at the correct time and in the correct manner see Chaniotis 2013: 182.
28 Euripides, *Bacchae* 6–10.
29 Dillon 1997: 37.
30 Dillon 1997: 24.
31 Apollonios Rhodios, *Argonautika* 2.516–27; Diodorus Siculus 4.82.1–3; Theophrastos, *De ventis* 14.

32 Burkert 1987: 109–11; Davidson 2007b: 207. The rising of Sirius was used as a herald of the peak of summer heat from at least the sixth century BCE. Alkaios describes the thirst of nature caused by the intense heat during the rising of Sirius, and blames the star for men's lack of strength during this time (*Frag.* 347a).
33 Boutsikas and Ruggles 2011: 55; Ruggles 2005a: x; Ruggles 2005b: 11.
34 For a more detailed discussion on archaeoastronomical methodology see Ruggles 1999, 2000.
35 Ruggles 1984: 14.
36 Ruggles 2000: 170.
37 Ruggles 1999: 154.
38 Sprajc 1993: 272–3; see also Aveni 1997: 139–42.
39 Bricker and Bricker 1996: 198–201; Ruggles 2005a: xvi.
40 Thomson 1943: 53; Trümpy 1997: 1; Geminus, *Elementa Astronomiae* 1.8–22; Herodotos 2.4.1.
41 E.g., Aristophanes, *Clouds* 755–6; Mikalson 1975: 9; Trümpy 1997: 1.
42 Bickerman 1980: 28.
43 In Athens and Delphi, for example, the year started with the first new moon after the summer solstice, in Boeotia and Delos after the winter solstice, in Chios and fourth-century-BCE Miletos at the spring equinox, in Sparta, Rhodes, Crete, and pre-fourth-century-BCE Miletos at the autumn equinox, etc. (Thomson 1943: 53).
44 For the Attic calendar see Trümpy 1997: 6–9; Corinthian, Trümpy 1997: 155–64 (esp. 163); Delphic, Trümpy 1997: 212–13; Theban, Trümpy 1997: 236–40; Macedonian, Trümpy 1997: 262–5; Rhodian, Trümpy 1997: 167–78.
45 Trümpy 1997: 130, 143, 182, 186, 253.
46 Aristophanes, *Clouds* 1134.
47 Herodotos 6.106.3; Plutarch, *Aristides* 19.7.
48 Boutsikas and Ruggles 2011: 58.
49 *Works and Days*.
50 Sourvinou-Inwood 1991.
51 Aristophanes, *Clouds* 615–19.
52 Bickerman 1980: 57.
53 *De re rustica* 1.28.
54 *Fasti* 4.913.
55 Plutarch, *Agesilaos* 11.3; Vernant 1983: 107. Consult Ferrari 2008: 109 n.11 for other such occurrences and for Richer's argument of this observance being not for a shooting star but instead for Sirius. Richer (1988) gives a detailed account of the role of astrology in the government of Sparta.
56 Pettersson 1992: 114, 119; Vernant 1983: 102–9.
57 Herodotos 6.56; Pettersson 1992: 119.
58 Homer, *Odyssey* 19.178–9; Plato, *Minos* 319c, *Laws* 624a–b; Diodorus Siculus 5.78.2–4.
59 Plutarch, *Theseus* 15; Thomson 1943: 64.
60 Thomson 1943: 64; Plutarch, *Theseus* 21; Kallimachos, *Delos* 307–13; Homer, *Iliad* 18.590–606.
61 Thomson 1943: 64; Hesychios θαργήλια, D.L. 2. 44; Anon., *VPlat.* 6 Cobet; Plutarch, *Moralia* 717d.
62 Parker 2011: 196.
63 Eidinow 2011; Gould 2001: 203–34; Kindt 2012: 16–35; Morgan 2003.
64 Eidinow 2011: 11.
65 Myth: the telling of a story 'with suspended reference structures by some basically human action pattern' (Burkert 1979: 57). Ritual: the 'stereotyped action redirected for demonstration' (Burkert 1979: 57).
66 Assmann 2011: 4.
67 Fogelin 2007: 66.
68 Anderson and Stoddart 2007: 41; Scott 2010: 14 and n.50. For a detailed account of the evolution of spatial analysis, its techniques, past applications, and limitations see Scott 2010: 15–21.
69 Three levels of spatial analysis have been forged: the micro-level, which includes the analysis of individual structures, the macro-level, which focuses on the broader landscape, and the semi-micro or middle level, which combines both. For a discussion on all three see Scott 2010: 21–3.
70 E.g., Himmelmann 2002; Hölscher 2002; Scott 2010.
71 See, e.g., the study by Morris noting the strain of the participants in an outdoor installation at night in order to see, hear, touch, and smell (2011: 316, 324–5).

CHAPTER 2

1 Such studies may focus on specific types of rituals and their effect on emotions and experience; for example, healing or cave rituals, mystery cults, divination (e.g., Boutsikas 2017; Petsalis-Diomidis 2005; Ustinova 2009, 2013). Of great interest are also studies which

focus more generally on the role of embodiment, memory, and experience in ancient religious performance (e.g., Barsalou *et al.* 2005; Chaniotis 2013; Cusumano *et al.* 2013; Gould 2001; Hamilakis 2011; Wescoat and Ousterhout 2012).

2 The list is endless, so only a few examples of major studies are provided here: Alcock 2002; Bickerman 1980; Chandor 1976; Cole 2004; van Dyke and Alcock 2003; Friese 2010a; Gerding 2006; Hurwit 2004; Jost 1985; Lambert 2002; Lyndon 2009; Mylonopoulos 2006; Parke 1977; Parker 2005; Robbins 1994; Sourvinou-Inwood 2011. More than a decade ago, James Davidson acknowledged the neglect of time in studies of Greek religion (2007b), but the scarcity of studies considering it stands as proof that much more work is needed (e.g., Boutsikas 2011; Boutsikas and Hannah 2012; Boutsikas and Ruggles 2011; Connelly 2014: 45–75, 247–93; Cooper 1968; Ferrari 2008; Ustinova 2009; Williamson 1993, 2018).

3 Kundtová Klocová and Geertz 2019: 78.

4 Dinsmoor 1939: 122, 133; Nissen 1906: 122; Penrose 1893a: 383.

5 The presence of wall paintings has been attested as early as the seventh century BCE at Isthmia and Kalapodi and perhaps at the Hephaisteion in Athens (Miles 2016a: 214). The warning carved on the interior of the Rhodian sanctuary of Lorymna further confirms good visibility inside temples. For the inscription see Miles 2016a: 214; Sokolowski 1955: 172–3 n.74.

6 Korres 1984; Williamson 1993: 25–7.

7 Pausanias informs us that the water provided humidity, which was essential for the maintenance of the gold and ivory statue. He also informs us of the presence of another similar pool at the temple of Zeus in Olympia, which he says contained olive oil, rather than water, used for the cleansing of the cult statue (5.11.10; Lapatin 2001).

8 For further details and data on this consult Williamson 1993.

9 Williamson 1993: 27.

10 The deposits around the Classical temple of Demeter Malophoros at Selinous, for example, contained thousands of lamps (Miles 2016a: 207).

11 The use of temples at night does not mean that they were not also used until sunrise or at sunrise as well, however.

12 Williamson 1993: 14–15.

13 Boutsikas and Ruggles 2011: 57. Cf. Penrose 1892: 395; 1893a: 383. On this consult also Ruggles 1999: 230 n.20.

14 Penrose 1892: 396.

15 Penrose 1893b: 808; 1896: 383.

16 Ruggles 2005a: 345–7.

17 E.g. Swerdlow 1980; Toomer 1980.

18 A detailed discussion on the accuracy of calculating star visibility and the parameters affecting it is offered in Robinson 2009.

19 Ruggles 1999: ix.

20 There is also the question of the degree to which the structural orientation that remains in today's material record reflects the orientation of the structure as originally built.

21 Boutsikas and Ruggles 2011: 58.

22 Boutsikas and Ruggles 2011: 58.

23 Penrose 1892: 396. See also Nissen 1885: 364.

24 Nissen 1887: 45.

25 Magnetic corrections were calculated using the online Magnetic Field Calculator of the National Centres for Environmental Information (www.ngdc.noaa.gov).

26 Lloyd 1984: 344–5.

27 For a number of sites, Google Earth lacks high-resolution images, for example.

28 There are no other cases of surveyed temples that were positioned close to metal structures (e.g., railings or fences) which may have caused errors in the magnetic compass readings. In those cases where metal poles are used to rope off the temples (as for example at the Erechtheion and the Parthenon in Athens), the survey permits enabled me to enter the structures, thus allowing sufficient distance between these objects and the points from where the orientation measurements were taken. The multiple readings taken from several points in these structures, and their cross-referencing with Google Earth, confirmed the accuracy of the measurements.

29 Declinations in this book have been calculated using the software GETDEC created by Clive Ruggles. GETDEC is purpose-designed for use by archaeoastronomers in that it adjusts its astronomical computations to account for empirical experience with refraction and other kinds of real-world atmospheric conditions to which naked-eye observations of sunrise and sunset phenomena are subject.

30 Boutsikas and Ruggles 2011: 57.

31 All ancient sky reconstructions included in this work were created using Starry Night Pro 6 and Stellarium.

32 Depending on one's definition of 'equinox'.
33 For a fuller explanation, see Ruggles 1999: 18.
34 For a more detailed discussion on factors to take into account when calculating the visibility of stars, consult Robinson 2009: 358–69.
35 Attlee 2011: 68–71.
36 Greyscale vision does not only exist in nocturnal conditions. Visual neuroscience research has revealed that even in diurnal conditions, far-away objects are perceived as grey or blue, as a result of atmospheric scatter (Middleton 1952; Schreuder 2008: 276).
37 Schreuder 2008: 215.
38 It should be noted, though, that there is a clear distinction between (subjective) brightness and luminance. Whereas luminance can be measured, brightness is a sensation, meaning that we have no way of creating units of measurement for it; it is a subjective impression. For more on this topic, consult Schreuder 2008: 281–4.
39 Schreuder 2008: 253.
40 Baker 2015: 750.
41 Kosslyn and Rosenberg 2003; Schreuder 2008: 223.
42 Schreuder 2008: 223.
43 Schreuder 2008: 284.
44 Hurlbert 2004: 186–7.
45 Schreuder 2008: 285.
46 Ruggles 2005a: xii.
47 *Homeric Hymn to Helios* 9, 15–17.
48 *Homeric Hymn to Selene* 7–13.
49 Hesiod, *Theogony* 744–54.
50 Geertz 2016: 128.
51 Vernant 1983: 116–19.
52 Berger 1967: 35.
53 Plutarch, *De genio Socratis* 590a–592e.
54 Pausanias 9.39.8.
55 A detailed discussion on these ideas can be found in Vernant 1983: 115–28.
56 Aristotle, *On Memory and Reminiscence* 451a, 14–17.
57 Hamilakis 2014: 118.
58 Sutton *et al.* 2011: 526.
59 The terms 'embodied' and 'embodiment' are used here as umbrella terms. In so doing, it is acknowledged that the terms can represent various aspects of the field, but to engage in a detailed discussion of their explanatory and/or methodological differences is beyond the scope of this work.
60 In short, *extended cognition* means creating tools capable of enhancing actions and interaction, such as symbols, objects linked to certain actions which thus carry a certain meaning, props, etc. Examples may include the red carpet in Aeschylos' *Agamemnon*, or the meaning of the wheat in the Eleusinian Mysteries, or the magnetised ring and purple belt of the Samothracian Mysteries. For a brief discussion on the meaning of *extended cognition* in general, see Kundtová Klocová and Geertz 2019: 78–9.
61 Geertz 2010: 306.
62 Van Gelder and Port 1995: ix; Kundtová Klocová and Geertz 2019: 78.
63 The term 'collective memory' has become loaded. Recent studies have warned against the dangers of overemphasising the polarities of individual and collective memory (e.g., Feindt *et al.* 2014: 30). When referring to collective memory and remembering in this study, I do so not in order to differentiate collective remembering from individual consciousness, but in order to denote a process which involves the participation of a group, as opposed to remembering in the context of a solitary individual.
64 Geertz 2011: 11–12. The idea that it is not possible for things (or even ideas) to have a cognitive life in isolation is also demonstrated in Wheeler 2010.
65 Kundtová Klocová and Geertz 2019: 81–4.
66 For a discussion refuting the unity and homogeneity of memory and a detailed analysis of why the study of the singular memory of a (religious) group offers only a simplistic understanding of a culture as comprised of static entities, see Feindt *et al.* 2014. See also Erll 2011; Jordheim 2012.
67 Halbwachs 1980. For a critical assessment of Halbwachs see Counsell 2009: 4–5.
68 Van Dyke and Alcock 2003: 4.
69 Connerton 1989, 2008.
70 Connerton 1989.
71 Van Dyke and Alcock 2003: 4.
72 Consult for instance Chang 1983: 33–43; McEnany 1995.
73 E.g., Tilley 1994: 173–200.
74 See, e.g., Petsalis-Diomidis 2005; Rutherford 2005, 2012.
75 Van Dyke and Alcock 2003: 4.
76 Feindt *et al.* 2014: 28. No further detail is required for the purposes of this study on the arguments and theories regarding memory. Debates on this topic and theories about the complexities of memory can be found in Feindt *et al.* 2014; Geertz 2016.

77 Koselleck 2003: 246–64; 2004: 255–76; 2010.
78 As concluded in his study of fashion in France after the Revolution (Connerton 1989: 10).
79 Thompson Drewal 1992: 4.
80 Assmann 2011: 6.
81 A distinction which does not affect the arguments presented in the following chapters – but which is nevertheless helpful to bear in mind in the context of the various mechanisms influencing the creation of memories – is that between passive (in the sense of an effortless recollection) and active (involving a deliberate effort to maintain recollection of something, which can be through taking notes, for example) transmission of cultural memories. On one hand, the need for repetition in ritual re-enactments in order to satisfy the need for tradition, essential in ritual performance, makes them 'the most passive transmission of memory'. On the other, the means by which religious tradition is transmitted is indisputably active (Harrisson and Roy 2012: 257).
82 Malafouris and Renfrew 2010: 2.
83 Thus rendering remembrance as much a cognitive process interacting with the surroundings as a bodily one (Jones 2007: 31–2).
84 Harris *et al.* 2010: 133. Jones demonstrates that knowledge and memory are gained through embodied engagement, resulting in a mutual interaction between and inseparability of the mind, the body, and the world (2007: 6–12, 27). Consult also for a detailed discussion on the problems of viewing memory as storage container and thus the mind as an isolated entity.
85 Godden and Baddeley 1975.
86 Gregory 1992: 463; Tulving and Pearlstone 1966.
87 Kundtová Klocová and Geertz 2019: 74.
88 Arlow 1961. See also Anastasopoulos *et al.* 2010: 126.
89 On this and the function of Social Network Theory in ancient Greek religion see Eidinow 2011.
90 Sutton 1998, 2009. Such context-dependent reconstructions are, of course, culturally determined methods of educating. Being part of a culture entails the production of modes of knowledge for the members of this culture (Kechagias 2009: 80–1).
91 Sutton *et al.* 2011: 545.
92 E.g., Bachelard 1964; Casey 1987; de Certeau 1984; Halbwachs 1980; Nora 1989.
93 Lyndon 2009.
94 *Physics* 4.210b.
95 Feld and Basso 1996; Jones 2007: 63.
96 Van Dyke and Alcock 2003: 6.
97 More detailed discussion on the ideas of place, memory, and social engagement can be found in van Dyke and Alcock 2003: 1–13.
98 Halbwachs 1980: 134.
99 Van Dyke and Alcock 2003: 4. A number of studies investigate these relationships. The best known of these include Bourdieu 1977; Foucault 1977; Giddens 1984; Harvey 1989; Lefebvre 1991; Soja 1996.
100 Examples of phenomenological approaches are Gosden 1994; Thomas 2006; Tilley 1994. Examples of landscapes and built environments influencing cognition include van Dyke and Alcock 2003: 4.
101 For a more detailed discussion on recent advances and criticisms of phenomenological approaches, see for instance Hamilakis 2014: 97–104.
102 Freitag's study on Olympia, for example, argues that Olympia was such a space from the 'earliest time' of its existence (2011: 72). Despite the difficulties in defining when this 'earliest time' is perceived to have been by the author, the study demonstrates the difficulty of trying to separate memory from religious spaces.
103 Crumley 1999: 271.
104 Bergson 1991; cf. Jones 2007.
105 For an example of this see Hamilakis 2011: 216–17.
106 Geertz 2010: 308. Recently, the absence of 'consensus on the concept of embodiment in its various uses ranging from cultural analysis to neuroscience' has been noted, as well as the possibility that clear unifying theoretical models sufficient to explain the empirical evidence on the interconnectedness of body and mind 'may never be realised' (Kundtová Klocová and Geertz 2019: 77). Mario Telò's work on embodiment and the senses, the discussion on what can be understood as material ('new materialisms'), and the materiality of emotions in the context of ancient Greek theatrical performance reveals a novel approach to understanding ancient performance (Telò 2018; Telò and Mueller 2018).
107 Barsalou *et al.* 2005: 14.
108 The idea that this communication is a constructed illusion achieved through the staging of rituals is discussed in Chaniotis 2013.

109 'Man is an animal suspended in webs of significance he himself has spun' (Geertz 1973: 5); Hamilakis 2014: 9–10.
110 Halbwachs 1980: 140.
111 Tuan 2003: 150.
112 Trigg 2009: 210–11.
113 Hamilakis 2014: 10.
114 E.g., Geertz 2016: 129.
115 Because of our general familiarity with ancient Greek culture (mostly in relation to mythology) we are in danger of forgetting the distance separating us from ancient Greece. For an interesting discussion on the problems of maintaining this cultural distance, see Versnel 2011: 11–17.

CHAPTER 3

1 E.g., Beyer 1990; Burkert 1988: 37; Mikalson 2010: 18; Scully 1979: 44, 151.
2 Boutsikas and Ruggles 2011.
3 Scully 1979: 140.
4 Aristophanes, *Birds* 999–1009.
5 Vernant 1983: 180–1, 186.
6 Shipley 2005; Vernant, 1983: 224. This idea becomes very prominent in the Roman period, where we have explicit references to the importance of astronomy and cardinal orientations both in city planning and in the layout of religious structures (Vitruvius, *de Architectura* 1.1.3, 1.6, 4.5.1, 4.9.1; González-García *et al*. 2014; Peterson 2007).
7 See Chapter 1 and Trümpy 1997.
8 See Chapter 6.
9 Dinsmoor 1939: 115. Dinsmoor understood that Penrose's model, which derived specific temple foundation dates based solely on the alignment between the temple's axis and the sun at sunrise, ignored archaeological dating, and indeed produced dates which contradicted archaeology. We discussed some of the problems of this idea in Chapter 2. Dinsmoor sought to improve on this earlier methodology by taking into account archaeological dating. However, he maintained the assumption that the axis of the temple was aligned towards sunrise on the day its foundations were laid. Giving priority to this assumption over archaeological dates, he also produced dates which contradicted archaeology, resulting in a continuation of the inherent problems found in Penrose's work. For example, Dinsmoor deduced that the temple of Olympian Zeus in Athens was constructed on 3 April 521 BCE, the temple of Hephaistos in the Athenian Agora on 17 October 449 BCE, the Erechtheion on 15 September 478 BCE, etc. (1939: 155–6, 162–4, 168).
10 See Appendix.
11 Burkert 1988: 37.
12 The constellation is very big, stretching from -20° to $+12^{\circ}$.
13 Consult Ruggles 1999: 60–3.

CHAPTER 4

1 E.g., epithets linking him with timekeeping and calendars such as Neoumenios/Νεομήνιος or Noumenios/Νουμήνιος (he of the new month or new moon; Graf 2009: 20) and Εἰκάδιος (from εἰκάς, meaning 'twentieth'; Rutherford 2001: 206 n.2). For references to Apollo being associated with the beginning of the new month see Herodotos 6.57.2; Hesiod, *Works and Days* 770.
2 Seneca, *Apocolocyntosis* 2; see also Graf 2009: 146–53.
3 Aeschylos, *Seven against Thebes* 859; Parmenides, DK 28A20; Empedokles, DK 31A23.
4 *Homeric Hymn to Apollo* 20, 48, 52, 120, 130, 146, 201, 254; Detienne and Doueihi 1986: 51.
5 Graf 2009: 151. For a further discussion on the translation of the two epithets and their solar meaning, see Farnell 1907: 139–41.
6 Herodotos, *Frag.* 48.3: φησὶν ἑῶν τὸν Ἀπόλλωνα προσαγορεύσθαι καὶ βωμὸν αὐτοῦ εἶναι ἐν τῇ νήσῳ; Apollonios Rhodios, *Argonautica* 2.686. Detienne and Doueihi go as far as to argue that Apollo becomes a synonym of the sun and the sun's light at dawn in the Orphic tradition (1986: 52; Detienne 1985).
7 Euripides, *Phaethon* 224–6; Plato, *Laws* 946c; Plutarch, *De Defectu Oraculorum* 413c; Plutarch, *De Pythiae Oraculis* 400c–d; Plutarch, *De E apud Delphos* 393c–d; *CIG* 3500: ἱερεὺς τοῦ προπάτορος θεοῦ Ἡλίου Πυθίου Ἀπόλλωνος Τυριμναίου; Ἥλιος ὃν καλέουσι Ἀπόλλωνα κλυτότοξον (*OF* 413.10); [...] τὸν δὲ Ἥλιον μέγιστον τῶν θεῶν ἐνόμιζεν εἶναι, ὃν καὶ Ἀπόλλωνα προσηγόρευσεν· (*OF* 536.2–4, cf. Bernabé 2005: 110); καὶ Φοῖβος Ἀπόλλων, ὅς τε καὶ Ἠέλιος κικλήσκεται (cf. Bernabé 2005: 109); Proklos, *On the Hieratic Art* 150.10–5.

Kallimachos disproves of the distinction between Apollo and Helios (*Frag.* 48). Alberto Bernabé lists the identification of Apollo as Helios – in Orphism (2010: 431, 439). For the worship of Apollo in the same precinct as Helios and the close association of the two gods in Classical Athens see Biliç 2012: 513–15; Hurwit 2017: 540. The solar character of Apollo is also prominent beyond Greece. A number of Apollo Helios cults are attested in Asia Minor: e.g., in Patara, Thyateira, Smyrna, and Phrygia (Farnell 1907: 139).

8 This idea was maintained in later philosophies (e.g., Aristotle, *Metaphysics* 1.985b 23ff.; Aristotle, *On the Heavens* 2.9). See also Barker 2004: 33; Kahn 2001: 26. For the association of Apollo's lyre as a symbol of cosmic harmony and the belief in Apollo tuning the cosmic harmony with his lyre and music, see McGuire and Rattansi (1966: 116); for Apollo associated with the harmony of the spheres in Heraklitos, see Bilić (2012: 514); and also Godwin (1993: 48) for similar references in Athanasius, a later source.

9 Plato, *Cratylos* 405c–d. See also Telò on the role of music and the Muses in cosmic harmony and the contrast with Typhon (2014, esp. 36–7).

10 Pliny the Elder, *Natural History* 4.88ff.; Fontenrose 1959: 382.

11 On the birth of the gods from the sea, see Beaulieu 2008: 2; Rudhardt 1971. Consult also Dietz 1997.

12 Graf 2009: 31, 42; Sourvinou-Inwood 1987: 226.

13 Plutarch, *De E apud Delphos* 8–9.

14 Friese 2010a: 277.

15 For a discussion on evidence of steps in Delphi, Klaros, and Didyma see Friese 2010a: 277–8.

16 Plutarch, *Moralia* 292e; Flaceliere 1965: 39; Fontenrose 1959: 383; Karouzos 1974: 127–8; Parke 1967: 28–9.

17 Plutarch, *Moralia* 292e; Theognis 775–9; Fontenrose 1959: 383. Alkaios (paraphrased by Himerios) reports that Apollo returned in the summer at a time that would nearly coincide with the Pythian festival (*Frag.* 2f). In Himerios, Apollo sojourns every ninth year with the Hyperboreans, ἀπὸ ἰσημερίας ἐαρινῆς ἕως Πλειάδος ἀνατολῆς (Diodorus Siculus 2.47.7); Farnell 1907: 104, 421, and n.256d; Fontenrose 1959: 383.

18 Cf. inscription of the Labyadai, *Bulletin de* Correspondance *Hellénique* 1895, vol. 19.1: 5–69, especially D.l.6.

19 Salt and Boutsikas 2005.

20 Plutarch, *De E apud Delphos* 389b–c; Mikalson 2010: 97. It is possible that the oracle offered consultation during the winter or on the biennial festival of Dionysos outside the temple of Apollo, but these oracles 'were considered less trustworthy' (Fontenrose 1959: 379).

21 Flaceliere 1965: 36.

22 Plutarch, *De E apud Delphos* 389c; Fontenrose 1959: 382; see also Cicero, *De Natura Deorum* 3.23.57.

23 The three months during which Dionysos was residing in Delphi were months of mourning, as Dionysos 'was seen as the god of winter and death' (Fontenrose 1959: 379). This is also attested in literature: the only songs sung in Delphi during these months were dithyrambs, while prayers were only addressed to Dionysos (Aeschylos, *Eumenides* 24–6; Plutarch, *Moralia* 365a, 389c). With Apollo's return on the seventh of Bysios (Plutarch, *Moralia* 292e; Fontenrose 1959: 383) κλητικοί hymns were sung, welcoming the god (Plutarch, *Moralia* 389c). For the next nine months, during Apollo's presence in Delphi, paeans replaced the dithyrambs.

24 Pausanias, 1.4.4; Farnell 1907: 101.

25 The most recent research on the temple's interior argues that the back of the *adyton* was shielded by a wall, as well as for the presence of two faults running underneath the *adyton*. The research contends that petrochemical fumes emanating from the faults could help induce visions (Amandry 1997; de Boer *et al.* 2001: 707–10; Friese 2013: 231).

26 Boutsikas 2007: 101–5; Salt and Boutsikas 2005.

27 See also Graf 1979: 4.

28 399–401, 436–7, 440–3, 493–6.

29 *Republic* 427b–c. See also Davies 1997: 50; Farnell 1907: 197, 202. Other examples of the legal input of the Delphic oracle in the Greek state of affairs are suggestions of a legislator or arbitrator by the oracle, such as those of Zaleukos to the Lokrians and Demonax of Mantineia to the Kyrenaians (Schol. Pindar, *Olympian* 11.12–19, quoting from Aristotle's *Lokron Politeia*; Farnell 1907: 197 n.d).

30 Herodotos 6.57.2–3.

31 Farnell 1907: 216.
32 Pausanias 8.38.8.
33 18.141.
34 Burkert 1979: 59; Chappell 2006: 331. For ancient sources on this see Burkert 1979: 59 and n.31. Consult also Janko 1982: 112–15.
35 Euripides, *Ion* 283–5. For a much more detailed study concerning the overlaps and deliberate distinctions of epithets of Apollo in ancient Greek cults see Davies 2007. On the idea of 'Pythian' seen as a toponymic in Delphi see Davies 2007: 57.
36 4.18. For the text and translation of the *parapegma* consult Lehoux 2007: 390.
37 1.316.
38 Salt and Boutsikas 2005.
39 Salt and Boutsikas 2005: 570.
40 Πυθιάδα ἐόντων τοῦ Βουκατίου μηνὸς τοῦ ἐν Δελφοῖς (*IG* II^2, 1126 line 46–7 (same as *IG* II, 545 [Koehler 1877])). For corrections on the spelling of the inscription see Rougemont 1973: 79.
41 Calame 2001: 102; Fontenrose 1959: 383; Pavlou 2011: 65; Vrettos 2008: 196.
42 For a description of the Daphnephoria see Wilamowitz-Moellendorff 1922: 186–7. See also Pavlou 2011: 65. For Septeria: Plutarch, *Quaestiones Graecae* 12; Clement Alexandria Schol. 298.29–299.19; Photius, *Bibliotheca* 321a–b; Burkert 1983: 144–7; Farnell 1907: 293–5; Fontenrose 1959: 453–61; Nilsson 1906: 151; Rutherford 2018. Or perhaps annually: Rutherford translates Pindar's reference as an annual festival on the grounds of the word *eniautos*, but does not identify it with the Daphnephoria (2001: 206). Against this suggestion Pavlou discusses Apollodorus' use of the word as indication of both annual and *enneateric* festivals (2011: 65 n.25).
43 Plutarch, *Quaestiones Graecae* 12.
44 Vrettos 2008: 638. Mommsen placed the timing of the Septeria in Metageitnion/Boukatios (1878: 114).
45 For a discussion on the Septeria procession and its importance in Thessalian identity see Graninger 2009: 112–13.
46 Calame also agrees with the suggestion by Nilsson and Farnell of the Theban Daphnephoria and the Delphic Septerion as spring festivals of renewal (2001: 103; Farnell 1907: 284–6; Nilsson 1906: 165).
47 An inconclusive suggestion put forward by Müller suggests that the Theban Daphnephoria took place in the same month and on the same day on which the Delphian boy broke the purifying laurel boughs in Tempe (1844, vol. 3: 329–31); an interesting suggestion, which needs, however, further support.
48 Calame 2001: 102–3.
49 *Chrestomatheia* 321^{b}32–322^{a}13; Pausanias 9.10.4; Farnell 1907: 427 n.267.
50 Βούλεται δὲ αὐτοῖς ἡ μὲν ἀνωτάτω σφαῖρα τὸν ἥλιον (ᾧ καὶ τὸν Ἀπόλλωνα ἀναφέρουσιν); Konaris 2010: 497. Against this identification, Farnell proposed that, although containing solar features, it should be perceived as a vegetation ritual reflecting 'sun-magic' rather than 'sun-worship' (1907: 143).
51 Müller 1844, vol. 3: 215. On the astronomical character of the Daphnephoria consult also Schachter 2000. A festival of similar nature seems to have been celebrated in Athens, but is only mentioned in Proklos, who notes that the Athenians honoured the seventh day as sacred to Apollo by carrying laurel boughs, adorning the basket with garlands, and singing hymns to the god (in Photius, *Bibliotheca* 321a–b).
52 Lehnus 1984: 83; Rutherford 2001: 256.
53 Farnell 1907: 104, 294. The principal ancient source is Plutarch, *Quaestiones Graecae* 12.
54 Calame 2001: 103; Farnell 1907: 284–6; Nilsson 1906: 165. On the festival see also Lehnus 1984: 83–4; Schachter 1981: 83–5.
55 Further indications of the importance of time in the Daphnephoria include the use of the words *nyn*, *eniautos*, and *horae*, all of which seem to associate the festival with cyclical time, renewal, and the regeneration of nature. On this see in particular an excellent discussion in Pavlou 2011: 66–7.
56 The late Byzantine *Lexica Segueriana* associates Apollo with the sun at the summer solstice (i.247.1–6 *Anecdota Graeca* Bekker sv Ἑκατομβαιών) cf. Biliç 2012: 515). Documented evidence of the use of the solstices in timekeeping dates at least to the time of Hesiod (*Works and Days* 479, 564, 663). It is believed that the even earlier reference to τροπαὶ ἠελίοιο in the *Odyssey* refers to the solstices (15.404). We are informed that a solstice-marking device (ἡλιοτρόπιον) was set up in the Pnyx in fifth-century-BCE Athens and was used by Meton for observing both the winter and the summer solstice (Philoch. *FGrHist* 328F122; Lehoux 2007: 96). We mentioned also in Chapter 1 the cave in

Syros used as a solstice marker and the fourth-century-BCE solstice marker of the Cretan Itanos (Diogenes Laertius, *Frag.* 1.119, cf. Kirk *et al.* 2007: 54–5, 56).

57 Plato, *Laws* 12.945e.

58 Plato, *Laws* 12.945e, 946b, 946c.

59 Bilić 2012: 513–15; Burkert 1985: 336.

60 Strabo 9.2.11; Lambert 2002: 381. That this lightning was considered to be a message from Apollo Pythios is attested in Euripides, *Ion* 285. For more references to the custom of the Pythaistai see Farnell 1907: 395–6 n.156d–n. On the Pythaistai see also Parke 1939, although he places the time of the Pythaistai watch in the three summer months.

61 Lambert 2002: 370.

62 Lambert 2002: 392.

63 Lambert 2002: 370.

64 Strabo 9.2.11; Lambert 2002: 370.

65 Richards 1919: 113.

66 Dow 1965: 186, 191, 201.

67 The group of the Pythaistai is mentioned in the Erchian sacrificial calendar (259–61, 336–7, 536–8). See Dow 1965: 211.

68 The constellation's cosmical setting is also listed in the Oxford *parapegma*, which Lehoux dates to 15 CE. For the relevant *parapegma* entries consult Lehoux 2007: 221–2, 397; for the dating of the Oxford *parapegma* consult Lehoux 2007: 164.

69 Plutarch, *Theseus* 18.1.

70 Dietrich 1978: 9 n.176 and 177. For example, the eternal flame at Athens was from Delphi (Plutarch, *Numa* 9.5–6) and in Lemnos the people put out their fires for nine days and rekindled them with new pure fire brought from Delos (Philostratos, *Heroikos* 53.5–7). For further links between the two sanctuaries, see Boutsikas 2015: 89, 91.

71 *Homeric Hymn to Delian Apollo* 80–2; Virgil, *Aeneid* 3.84–99.

72 For a discussion on the possibility of an oracle at Delos see Parke 1986: 127 n.21.

73 Rolley 1973: 523.

74 Bruneau and Ducat 1965: 79, 80, 176.

75 Bruneau and Ducat 2005: 173, 174.

76 Bruneau and Ducat 2005: 174.

77 Boutsikas 2015: 91.

78 Bruneau and Ducat 2005: 186.

79 Kallimachos, *Hymn to Apollo* 60; Plutarch, *Theseus* 21.2.

80 Kallimachos, *Hymn to Delos* 304–13, with Mineur's commentary on line 313 (1984: 242); Graf 2009: 36. Mineur links the described performance with the Delia/Apollonia (1984: 239). Atheneos also mentions dancing performances in front of the temple of Apollo, but it is unclear whether he refers to the crane dance (*Deipnosophistae* 11.24).

81 Bruneau and Ducat 2005: 201–2.

82 Diogenes Laertius 8.1.13.

83 Clement of Alexandria, *Stromata* 7.6.32. The altar received only bloodless sacrifices (Macrobius, *Saturnalia* 3.6.2; Clement of Alexandria, *Stromata* 7.6.32; Diogenes Laertius 8.1.13).

84 *Homeric Hymn to Apollo* 140–64. For an analysis of this part of the myth see Miller 1986: 57–68. For more links between Delos and the Hyperboreans see Boutsikas 2015: 91.

85 Servius, *To Virgil Aeneid* 4.143. See also Farnell 1907: 291.

86 Apollodoros, *FGrHist* 244 F 37; Diogenes Laertius 3.2.

87 κανηφορήσασαν Δήλια καί Ἀπολλώνια (Homolle 1879: 379). The reason behind the double name of the festival may have been because the Athenians referred to it as Delia, whereas the Delians preferred to call it Apollonia (Ringwood-Arnold 1933: 453).

88 Lambert 2002: 382; Ringwood-Arnold 1933: 453; Sale 1961: 88, 89; Trümpy 1997: 64.

89 Farnell 1907: 289–90; Pascual 2009: 84.

90 3.104.1–3. Further evidence favouring Thargelion includes that no Athenian festival to Apollo was held in Athens before 7 Thargelion, which was also Apollo's birthday for the Athenians. The timing of the festival is much contested, though, and Rutherford suggests that it is impossible to confirm its timing with certainty (2004: 83).

91 E.g., Theognis 775; Dionysios Periegetes 527; Farnell 1907: 288.

92 Boutsikas 2015: 92.

93 *Frag.* 8.2. Consult Lambert 2002: 393.

94 Kallimachos, *Hymn to Delos* 36–40, 191; Apollodoros, *Library* 1.4.1; Hesiod, *Theogony* 409; Pindar, *Paean* 5.42. In Hygginos, Apollodoros, and Servius, Asteria becomes a quail instead of a star (Apollodoros, *Library* 1.4.1; Hygginos, *Fabulae* LIII; Servius, *To Virgil Aeneid* 3.73). In all versions of this myth Asteria becomes the island of Delos after abandoning her starry or bird shape.

95 Mineur links the construction of the Altar of Horns with the foundation of the city. Since this was the city altar of Delos, he deduces that

it must have been dedicated to the eponymous goddess (1984: 242). See also Bruneau 1970: 20ff.; de Santerre 1958: 180, 189ff.; Williams 1978: 59ff.

96 Ἀπόλλων, ἀστέρι εἰδόμενος (*Homeric Hymn to Apollo* 441); *Homeric Hymn to Apollo* 440–5. See also Buxton 2010: 84.

97 Morgan 1990: 134.

98 Kirsten 1940; Sporn 2002: 81–3.

99 Xanthoudides 1918: 27.

100 Marinatos identified evidence for cult activity outside the structure, in the west and north-west corners (Marinatos 1936: 268).

101 Burkert 1985: 92; Graf 2009: 115; Marinatos 1936: 257–8.

102 Klein and Glowacki 2009: 165 and n.54.

103 The animals brought at Delphi by the oracle seekers were goats and according to a later myth, goats were the first creatures to come in contact with the oracular gases emanating from the chasm (Davies 2007: 60).

104 Liritzis *et al.* 2017: 133.

105 Trümpy 1997: 188, 195.

106 Chaniotis 1996: 36, 38, 40.

107 As Beresford's recent study acknowledges, Greek seafaring remained largely consistent and 'was confined within a reasonably well-defined season' (2013: 12). All three ancient sources which inform us about the sailing season (Hesiod's *Works and Days* and two late Roman sources) propose dates 'which start and finish within virtually a month of each other' (Beresford 2013: 9). These sources seem to initially place the beginning of the sailing season in March or April and its end around mid/late autumn (Hesiod, *Works and Days* 618–94; Vegetius 4.39; *Codex Theodosianus* 13.9.3). However, even in Hesiod's time it was acknowledged that voyages (albeit risky) were still made outside those dates, thus placing the actual sailing season from late March to early November (*Works and Days* 618–29, 682–3; Beresford 2013: 10–12; Farnell 1907: 289; Hemberg 1950: 108; Snider 1978: 131). It is possible that during the Roman period, when seamanship had developed greatly in comparison to Hesiod's Archaic Greece, this season may have been extended further, but this would have not been the case in late Archaic and Classical Greece (on this see also Beresford 2013: 12). For a further discussion on the sailing seasons consult also Morton 2001: 255–65.

108 Lucian, *Bis Accusatus* 1.

109 Herda 2005: 258.

110 For more detailed discussions on the origins of the cult consult Brown 2004; Fontenrose 1988: 116–18; Parke 1985. Miller rejects the Asian origin of Apollo (1939: 5–24, 52–3), which is supported by Nilsson (1967: 559–64) and Wilamowitz-Moellendorff (1922: 30–1). Brown, on the other hand, contests this idea (2004).

111 Brown 2004; Parke 1985.

112 Kallimachos, *Branchos Frag.* 229 Z. 12–13; Fontenrose 1988: 121. See Pfeiffer, Kallimachos, *Frag.* 229 Z. 12–13. On the associated myths and their dates see Fontenrose 1988: 106–10.

113 Nilsson 1906: 168.

114 Herda 2011: 60, 65, 73. For the Boiegia/Didymeia consult Herda 2006: 187–211, 317–19, 351, 441–2, 453–4. For the date, Herda 2006: 167–70.

115 Herda 2011: 60.

116 Kawerau and Rehm 1914; Samuel 1972: 114–18.

117 Gorman 2001: 38; Herda 2011: 60.

118 Herda 2005: 258.

119 See plan in Herda 2005: 259, 281.

120 Herda 2005: 261, 285.

121 Herda 2005: 261, 260.

122 Fontenrose 1988: 85; Parke 1986: 128–9.

123 Conon, *Narrations* 33; Kallimachos, *Branchos* 229.7; Parke 1986: 124–5.

124 Lehoux 2005: 137.

125 Herda 2011: 60, 68.

126 Herda 2006.

127 Parke 1985: 28–30.

128 Pausanias 5.13.11; Parke 1985: 25.

129 Friese 2010a: 168.

130 Friese 2010a: 168.

131 Soyoz 2006: 14.

132 Parke 1985: 51.

133 Jan Köster has shown in a 3D reconstruction how the space of the *pronaos* combined with natural light created a mystical atmosphere (2018).

134 Parke 1985: 53.

135 Fontenrose 1988: 85.

136 Günther 1971: 193–4; Moretti *et al.* 2014: 38 n.39.

137 Fontenrose 1988: 80–2.

138 Parke: 1986: 122.

139 *To Apollo* 3.40; *To Artemis* 9.5.

140 Dewailly 2001: 367; Parke 1985: 128. For the history of the oracle see Parke 1985: 126–7.

141 Dewailly 2001: 367.

142 Curnow 2004: 129.
143 ἡ νὺξ ἐτύγχανεν ἡ ἱερὰ ἐπικειμένη; Aelius Aristide, *Hieroi logoi* III.312.11–12 (Jebb); Moretti 2010: 118, 121.
144 Moretti 2010: 113, 121.
145 De la Genière 1992: 209.
146 Moretti 2009: 175.
147 Moretti 2009: 172–5; 2013: 237.
148 Moretti 2011: 289; Moretti *et al.* 2014: 36.
149 Moretti 2013: 244; Moretti *et al.* 2014: 38.
150 Moretti 2010: 118.
151 Moretti argues for the presence of openings in the pavement of the *sekos* above the crypt for ventilation (2009: 171).
152 Moretti *et al.* 2014: 39, 40 and Fig. 5. For a reconstruction of the rituals consult Günther 1971: 119–23; Lane Fox 1997: 193–4; Parke 1985: 210–19; Parke 1986.
153 Tacitus, *Annales* 2.54.
154 Soyoz 2006: 11.
155 Moretti *et al.* 2014: 48.
156 De la Genière 1992: 198.
157 Friese 2010a: 178.
158 Moretti 2010: 121; 2011: 300; 2013: 239, 240, 244; Moretti *et al.* 2014: 34.
159 Iamblique, *De Mysteriis Aegyptiorum* 3.11.2–22; Busine 2002: 190–1. Some inscriptions of the second century AD, however, state that the delegates of the cities were admitted in the temple and were initiated. See, e.g., *CIG* II, 3538 = *Iscr. Perg.* n° 234, 1.4–5: μυηθέντες καὶ ἐμβατεύσαντες. Busine balances the two contradictory testimonies by asserting that the majority of oracle seekers would remain outside, in the *pronaos*, and only a privileged few would be allowed to pass through the labyrinth and arrive at the entrance of the first underground hall (2002: 193).
160 Moretti *et al.* 2014: 41; Moretti and Laroche 2010: 49, 50.
161 Lane Fox 1997: 192. For further similarities and differences between Didyma and Klaros see Lane Fox 1997: 191–3.
162 Moretti *et al.* 2014: 49.
163 Moretti 2010: 126.
164 Andersen *et al.* 2019.
165 Barrett 2004; Barrett and Lanman 2008; Guthrie 1980, 1993.
166 Andersen *et al.* 2019: 59.
167 Plutarch, *Moralia* 590; Pausanias 9.39; Friese 2013: 233.
168 On the importance of labyrinths in oracular consultation see also Soyoz 2006: 15–18.
169 Jost 1985: 94–5.
170 Pausanias 8.30.3–4.
171 According to Jost, the cult statue is more likely to have been placed in the *sekos* than in the *adyton* (1985: 95).
172 Cooper 1968: 106–7.
173 Jost 1985: 95.
174 Moggridge 1982: 18.
175 Kelly 1995: 263.
176 Kelly 1995: 232.
177 Kelly 1995: 234, 238, 241.
178 Kelly 1995: 242–3.
179 Kelly 1995: 243.
180 Kelly 1995: 248 and 235–6 for detailed plans on this.
181 Dinsmoor 1933: 213.
182 Kelly 1995: 242.
183 Cooper 1968: 106, 108–9.
184 Cooper 1996: 129–30.
185 Forte 2018.
186 For a detailed account of the problems encountered when entering astronomical data into UE4 and how these were resolved, consult Price 2020.
187 Digital reconstructions have started to be used recently in Classical archaeology as tools for interpreting the total environment of religious sites (e.g., Köster 2015).
188 Minor in terms of affecting the outcome and aims of this specific analysis.
189 Advanced Spacebourne Thermal Emission and Reflection Radiometer.
190 *2018* GDAL/OGR 2.4.0 release. For methodological difficulties of the landscape data, heightmap and resolution problems, methodology for establishing the model's coordinates and orientation, procedures, and the model's protocol, see Price 2020.
191 It is unfortunate that it has not been possible to produce realistic light diffusions in the VRM, but it has been possible to establish the movement of direct sunlight in the temple's interior, despite its non-realistic diffusion. This software limitation lies behind the omission of a lighting analysis discussing the light/shadow effects of the reconstructed moments.
192 The roof and side door thickness were modelled on Spawforth's illustrations (2006: 156–7).
193 Cooper 1968: 107.
194 Ruggles 1997: 127–8; Steele in press.
195 Boutsikas in press.
196 Miles 2016b: 154–5.
197 Jenkins 2006: 134; Psycharis *et al.* 2000.

198 Cooper 1996: 10.
199 See Madigan 1992: 19.
200 Cooper 1996: 69.
201 One of two ever discovered in sanctuaries, the second also dedicated to Apollo at Mon Repos in Kerkyra.
202 Madigan 1992: 18–22, 27.
203 Madigan 1992: 27.
204 Madigan 1992: 13–14.
205 Hirst and Hirst 1927: 113; Rutherford 2004: 82–3.
206 Plato, *Phaedo* 58a–b. For a discussion on the links between the Delia/Apollonia and the myth of Theseus see also Rutherford 2004: 82–3; Stehle 1997: 159 n.111.3.
207 Dietrich 1978: 10.
208 Pindar, *Olympian* 2.61–3; Boutsikas in press; Woodbury 1966: 607.
209 Busine 2002: 195; Lewy 1978: 22.
210 Wescoat 2012: 66. See also Jones 2000.
211 Homer, *Iliad* 18.590–605; Diodorus Siculus 4.77.
212 Soyoz 2006: 16–21.
213 For more detail on the architecture and experience of Herakleia Pontica and Herapolis see Friese 2010a: 171–5.

CHAPTER 5

1 In Meskell's words the 'lived body' rather than the represented body (1996).
2 On the form of Kekrops combining man and snake and his importance to Athenian identity see Ogden 2013: 260–3. Ogden adds the lawgiver Drakon to the list of Athenian serpentine ancestry (2013: 263, 270). The figures of Erechtheus and Erichthonios are hard to distinguish and seem to have a number of overlapping myths and attributes. For the purposes of this study, since they are both considered to be autochthonous and half-snake, with very similar birth myths, both had a wife called Praxithea, and both were associated with the yoking of chariots, etc., it is sufficient to consider them as variant names of the same figure. For further discussion and support of this argument and for a discussion of Erechtheus and Erichthonios' nature see Burkert 1983: 156; Connelly 1996: 56; Ogden 2013: 263–7; Sourvinou-Inwood 2011: 25–31, 51–65.
3 For a more detailed discussion on the function of the myth of Kekrops and Erechtheus/Erichthonios and Athenian autochthony see Csapo 2005: 237–44.
4 Much has been written about the importance of the myths celebrating Athenian autochthony in the formation of Athenian identity. See, e.g., Clark 2012: 83–8, Forsdyke 2012; Loraux 1993. For instances where Athenian autochthony is used in literature to denote ethnic superiority see, e.g., Plato, *Menexenus* 237b, 245c–d; *Timaeus* 23d.
5 Psarra 2004: 79.
6 Neils 1992: 26.
7 Cf. Holland 1924 IV: 433–4.
8 On the various interpretations of the location of the Erechtheion's cult spots consult Lesk 2004: 42–50; Overbeck 1972.
9 See Holland's initial assessment of the existence of a Bronze Age palatial complex (1924 I: 1–23, II: 142–69). The pottery assessment has been lightly revised since Holland's publication. For the structure under the Erechtheion see also Iakovides 1983: 75; 2006: 69–75, 147. The idea of the existence of a Mycenaean palace is contested by later studies of the remains (Bundgaard 1976; Iakovides 1962). For an overview of the Bronze Age Acropolis consult Hurwit 1999: 67–84; Iakovides 2006: 190–6.
10 Hurwit 1999: 71.
11 Lesk 2004: 30 n.12.
12 Stevens 1946: 93.
13 Casanaki and Mallouchou 1985: 98; Dörpfeld and Schleif 1942; Elderkin 1941; Hawes 1935, 1936; Holland 1924 II: 155–6, 159; Hurwit 1999: 72–4; Paton *et al.* 1927; Stevens 1946: 97, 102.
14 See also Hollinshead 2015; Lesk 2004: 112–14.
15 Hollinshead 2015: 183.
16 Holland 1924 II: 157; Stevens 1946: 102.
17 Stevens 1946: 97.
18 Hollinshead 2015: 177, 181, 183. The *poros* blocks of the paved area were laid in rows underlying the late fifth-century marble paving blocks and they extend nearly 3 m farther to the east, much farther than what seems necessary if their function was to simply support the marble paving. These marble blocks, dated to the Themistoklean phase, have been interpreted as a forerunner of the Classical theatral area (Hollinshead 2015: 181). Hollinshead argues that the rituals performed in the theatral area were associated with the Plynteria and the Kallynteria, when the

wooden *xoanon* of Athena was washed and dressed (2015: 179).

19 Athena entering the 'Strong House of Erechtheus' in *Odyssey* 7.78–81 and *Iliad* 2.546–9.

20 Burkert 1985: 50; Hurwit 1999: 74; Nilsson 1950: 485–98.

21 Hurwit 1999: 192.

22 Aristophanes, *Wasps* 438; Euripides, *Ion* 1163–4; Ogden 2013: 265; Parker 1994: 193.

23 Later references maintain the presence of a snake cult near the Erechtheion (Herodotos 8.41; Aristophanes, *Lysistrata* 759).

24 E.g., Aristophanes, *Frag.* 637; Pseudo-Eratosthenes, *Katasterismoi* 13; Hellanikos (in *FGrHist* 324F:2); Philochoros (in *FGrHist* 328F:8); Pseudo-Apollodorus, 3.14.6. On the foundation of the festival by Erichthonios see Sourvinou-Inwood 2011: 270–1.

25 Parker 1994: 196.

26 Pausanias 1.24.7.

27 The Erechtheion's predecessor is argued to have been oriented somewhat more north-easterly than the extant structure. Although the shift in orientation between the two structures is similar to the processional shift in β *Draconis*' declination from $+54^\circ\ 55'$ in 1400 BCE to $+53^\circ\ 17'$ in 400 BCE, such a change is so small as to be impossible to observe with the naked eye.

28 Aratus, *Phaenomena* 45–62; Pseudo-Eratosthenes, *Katasterismoi* 3; Hipparchus, *In Arati et Eudoxi Phaenomena* (e.g., 1.2.3, 1.4.4–5).

29 In Pseudo-Eratosthenes, Draco's head comprised three stars and its body and tail twelve, for a total of fifteen stars (*Katasterismoi* 3). The ancient constellation included also μ *Draconis*, which Aratus tells us formed the dragon's chin (Figure 5.2).

30 Lesk 2004: 113; Stevens 1946: 99.

31 Ogden 2013: 195–8 n.14.

32 Hyginus, *De Astronomica* 2.3. Another katasterism myth for Draco associates it with the snake Ladon, who was guarding the golden apples of the Hesperides (Euripides, *Herakleidai* 782–3) and was katasterised by Hera (Pseudo-Eratosthenes, *Katasterismoi* 3). Although the exact mythical serpent seen in the night sky is a matter of debate (Allen 1963: 203; Condos 1997: 102), the constellation is always identified as a serpent in Greek literature. For references and other versions of Draco's identity, see Condos 1997: 102–3.

33 Parker 2005: 255.

34 Aelius Aristides, *Panathenaicus* 13.189.4–5; Scholia on Aelius Aristides, *Panathenaic Oration* 362 (Lenz and Behr) = Dindorf 3.323 = Jebb 189, 4; Aristotle, *Frag.* 637 Rose. For references to works discussing the myth of Asterios and his relationship with the Panathenaia, see Connelly 2014: 46; Parker 2005: 255 n.11; Sourvinou-Inwood 2011: 271–80. For examples of the word Aster meaning 'star', see Aristophanes, *Peace* 833; Euripides, *Rhesus* 535; Homer, *Iliad* 4.75, 5.5, 22.289; Xenophon, *Memorabilia* 4.7.5. Vian (1952: 246–64) discusses Asterios as 'comprised of stars'.

35 Probus, on Virgil *Georgics* 1.244.

36 Neils 1992: 14, 15; Parke 1977: 33.

37 Anghelina 2017: 175 and n.2; Connelly 2014: 253–67; Proklos, on Plato *Timaeus* 17b; schol. Plato, *Republic* 327a. On the Great Panathenaia: schol. Aristides 13 *Panathenaikos* 115.19, 147.9, 147.13 (Dindorf); schol. Euripides, *Hecuba* 469 (Michaelis).

38 Parke 1977: 49; Robertson 1996a: 63; Aristophanes, *Frogs* 371; Euripides, *Heraclidae* 782–3.

39 For example, during a twenty-four-hour period, Draco will move from having its head up and its tail down to having its tail up and its head down.

40 Homer, *Odyssey* 5.272–6.

41 On possible dates when the *Odyssey* was committed to writing: Graham 1995: 4–8, esp. 7.

42 E.g., *Works and Days* 609–11. On ancient Greeks observing the upper and lower culminations of Draco for navigation see Biliç 2009.

43 Boutsikas 2011: 304–5. Auriga the Charioteer (Heniokhos) was associated with the katasterism myth of Erechtheus (Pseudo-Eratosthenes, *Katasterismoi* 13) and was visible in the north-east horizon, but its movement does not coincide at all with the festival (heliacal rising 16–30 May; acronychal rising 25 September–3 October).

44 Boutsikas 2011: 305–7.

45 Anghelina has recently argued that the timing of the Panathenaia on the twenty-eighth, which was also Athena's birthday, on an almost moonless night was intentional and associated the goddess with the crescent moon and dark nights (2017: 177, 180–1).

46 Meritt 1928: 118–20.
47 Meritt 1928: 118–20.
48 Gerding 2006: 392.
49 Mommsen 1898: 137–8.
50 *IG* II^2 334.
51 Gerding 2006: 393; Hoepfner 1997: 153–4.
52 Ogden 2013: 82, 84.
53 Ogden 2013: 84, 195 n.17, 196.
54 Hurwit 1999: 108, 110.
55 Ogden 2013: 84.
56 During the Plynteria, the sacred vestments of Athena were washed for the first time a year after Aglauros' death (Hesychios, sv Πλυντήρια; Photios, *Lexicon* κ 124 sv Καλλυντήρια; Philochoros, (Jacoby 1964) 328, F 106; *Lexeis Rhetorikai*, sv Καλλυντήρια (Bekker 1814: 270.1–5)). On the festival being initially founded in honour of Aglauros, see also Connelly 1996: 78; Harrison 1891: 353; Valdés Guía 2005: 64 n.57. Dontas refutes the linking of Aglauros with the Plynteria and instead argues that she was commemorated during her festival, which had mystic characteristics and was held in Skirophorion, in the cave of Aglauros in the east foot of the Acropolis hill, adding that her sisters were also honoured during the festival (1983: 56–7 and n.25; Athenagoras, *Legatio* 1.1). His argument is supported by the sacred calendar of Erchia, which lists sacrifices offered to Aglauros on the third day of Skirophorion (Sokolowski 1969: 57–9; see also Parke 1977: 179).
57 Herrington 1955: 29.
58 Burkert 1985: 228; Mikalson 1975: 166–7.
59 Pausanias 1.27.3; Broneer 1932: 50–5; Hurwit 1999: 42. An alternative interpretation has been offered in Robertson's seminal study of the Arrephoria, arguing that the basket was not taken to a sanctuary, but instead to an underground passage, since this would have been not only a more fitting setting to re-enact the birth of Erichthonios from inside the earth but also a better setting for an encounter with snakes as a re-enactment of the myth of Erichthonios and Kekrops' daughters (1983: 254–8).
60 Pseudo-Eratosthenes, *Katasterismoi* 13; Hyginus, *De Astronomica* 2.13.
61 Boutsikas and Hannah 2012.
62 Boutsikas and Hannah 2012.
63 For their association with the death of the maidens, see, e.g., Mansfield (1985), who discusses the similarities between the closing of the temple (Plutarch, *Alkibiades* 34.1) and the closing of the house of the deceased, the bathing of the statue and its wrapping in a shroud for transfer to the sea shore (Xenophon, *Hellenika* 1.4.12; Plutarch, *Alkibiades* 34.1), and the similar preparation of the deceased's body, etc. See also Boutsikas and Hannah 2012.
64 Suda sv Χαλκεία; Harp.; Robertson 1983: 276–7 and n.96; Sourvinou-Inwood 2011: 268. Whether the *peplos* was dedicated to the goddess once every four years or annually, with a grander *peplos* every four years, is still a matter of controversy. On this see Mansfield 1985; Parker 2005: 265; Sourvinou-Inwood 2011: 267.
65 Euripides, *Erechtheus* [Kannicht 2004] *Frag.* 65.77–80; Calame 2001: 181. More versions and details of this myth: Boutsikas and Hannah 2012: 1–2. According to a different tradition, the Hyades and their sisters, the Pleiades, were daughters of Atlas from different women, and the Hyades were the five daughters of Atlas and Aithra (Condos 1997: 171). In Euripides, Athena proclaims that the souls of Erechtheus' daughters 'have not gone to Hades'. Instead, she has 'caused their spirit to dwell in the upper reaches of the sky and [she] shall make a famous name throughout Hellas for men to call them the Hyakinthian goddesses' (Euripides, *Erechtheus* [Kannicht 2004] *Frag.* 370.71–4; Hard 2004: 370). See also Connelly 2014: 241–2. A scholiast to Aratos identifies these with the star cluster of the Hyades (Schol. Aratos, *Phaenomena* 172; cf. Connelly 2014: 148 n.96; Ferrari 2008: 147 n.66). For a discussion of the reason for calling them Hyakinthidae rather than Hyades see Davidson 2007a: 242–3.
66 *Frag.* Agora I 7577, Face B, line 16; Gawlinski 2004: 47, 49, 53.
67 Hurwit 2004: 7–8.
68 Dontas 1983: 50–3, 58–63; supported by Hurwit 1999: 101, 340 n.8 and Miller 1995: 211, 236.
69 A less-favoured option for the location from where the maidens jumped is the cliff behind the sanctuary of Artemis Brauronia in the south-west corner of the Acropolis. This location assumes that the girls ran from the Parthenon (Robertson 1983: 275).
70 Inscription no. 13371, lines 12–14. The cave is securely identified. It is also mentioned in

Herodotos in relation to the 480 BCE Persian attack (8.52–3; Connelly 2014: 30. Dontas associates Aglauros, Herse, and Pandrosos with 'the liquid element which is essential for the growth of plants' and links these offerings to the promotion of growth (1983: 55).

71 Inscription no. 13371, lines 28–9.

72 It follows that the setting of the star cluster would have been visible from the west end of the Parthenon. Its heliacal setting was visible from this location a month before the Kallynteria and the cosmical setting near the time when the weaving of the *peplos* commenced (Table 5.2).

73 ἔμπροσθε . . . πρὸ τῆς Ἀκροπόλιος, Herodotos 8.53.1; δαίμονές τ' ἀντήλιοι, Aeschylos, *Agamemnon* 519. See also Dontas 1983: 59.

74 Aratus, *Phaenomena* 172; Sourvinou-Inwood 2011: 123.

75 Sourvinou-Inwood 2011: 131–2.

76 Dio Cassius 54.7.3. It is certain that the gold and ivory statue faced east and it is possible that this was the direction that the Athena Polias statue also faced, as scholars interpret this reference to the latter image of the goddess (Ridgway 1992: 126).

77 Ancient writers very commonly incorporate in their narrations description of landscapes: Euripides, *Ion* 714–20; Euripides, *Phoenissae* 226–38; Sappho's description (Sappho, *Frag.* 2) [Lobel E. and Page D. (1963) Poetarium Lesbiorum Fragmenta, Oxford, 2nd ed.]; and Sophokles' description of Kolonos (Sophokles, *Oedipous at Kolonos* 668–700).

78 For a very similar conclusion, but from a different angle: Sourvinou-Inwood 2011: 280.

79 In a similar manner to the epiphany of Artemis at Brauron (Platt 2015: 492–3).

80 Whether the rite was borrowed through contacts with Lydia attested at the time by artefacts found in Sparta (Bosanquet 1906a: 331) or Alkman himself was brought from Lydia to Lakonia as a slave cannot be established on current evidence. It is generally accepted that whatever Alkman's origin, it is unlikely that he composed a poem describing a ritual that recounted an alien tradition (e.g., Penwill 1974: 25).

82 Detailed analysis of the poem is beyond the scope of this study. I therefore present the generally accepted interpretations only of verses relevant to this study.

82 Lines 1–35; Calame 1983; 2001: 1–2; Ferrari 2008: 20–69.

83 Much ink has been dedicated to the interpretation of the word φάρος, interpreted here as 'robe'. The interpretation of 'plough' is now mostly abandoned. The most recent extensive study on the interpretation of the word is Priestley, who convincingly argues that the word should be translated as 'robe' rather than 'plough' (2007).

84 ὀρθρίαι could also be interpreted as 'early morning', thus changing the translation of the passage to 'the Pleiades are rising in the early morning as we carry the robe'.

85 Based on other literary examples comparing robes to stars, Priestley has also suggested that the comparison of the brilliance should not be between the Pleiades and Sirius, but between the robe and Sirius: 'the robe shines like the star Sirius' (2007: 181). This suggestion was first put forward by West (1965) but has not been viewed favourably. Although it may have some merit, the generally accepted translation of this passage is adopted here (e.g., Bowra 1961: 45; Page 1951: 22; Segal 1983: 263).

86 I do not claim to have solved the translation of this perplexing passage. My aim here is to provide a working translation.

87 E.g., Patterson 2005: 122; Segal 1983: 263.

88 E.g., Burnett 1964: 31; Dale 2011: 28; Hutchinson 2001: 90–3; Segal 1983: 263–4; West 1965: 197. From a scholion on Theokritos we know that the Pleiades were also called *Peleiades* (Σ Theokritos 13.25a Wendel). The scholion states this to be the case according to Kallimachos (*Frag.* 693 Pf.). On this see also Dale 2011: 30.

89 E.g., lines 25–7, where the moon and the path (*poros*) of the stars are mentioned. Alternative interpretations include the word being a reference to an actual rival chorus (e.g., Page 1951: 52–7; Rosenmeyer 1966), an implied chorus, or the two *choregoi* Hagesichora and Agido (e.g., Robbins 1994; Segal 1983). A less-favoured interpretation is its translation as flying doves (e.g., Bowra 1961: 56; Too 1997: 19; Wilamowitz-Moellendorff 1897).

90 Bowie 2011: 48; Calame 1983: 332.

91 Patterson 2005: 124.

92 Page 1951: 25.

93 Hesiod, *Works and Days* 618–22; Hyginus, *De Astronomica* 2.21; Pindar, *Nemean* 2.17.

94 Hesiod, *Works and Days* 618–22.

95 Bowra 1961: 48, 51; Carter 1988: 91, 92; Garvie 1965: 187; Griffiths 1972: 17; Page 1951: 75–6.

96 Boutsikas and Ruggles 2011; Bowra 1961: 48, 51; Burnett 1964; Carter 1988: 91, 92; Garvie 1965: 187; Griffiths 1972: 17; Page 1951: 75–6; Segal 1983: 263–4.

97 Boutsikas and Ruggles 2011: 62–5.

98 West 1963: 156.

99 For the translation of *Aoti* as 'lady/goddess of dawn': Bowra 1961: 41; Ferrari 2008: 84, 93; Segal 1983: 262.

100 *Orthria* derives from the word *orthros*, which means daybreak or dawn. Whether *orthria* is dative singular, 'to the goddess of early morning', identified with *Aotis*, or nominative plural in an adverbial sense, 'the Pleiades in the early morning', cannot be determined on the basis of present knowledge. Most scholars prefer the former, also adopted here (e.g., Bowra 1961; Page 1951; for the latter interpretation: Segal 1983).

101 Bosanquet 1906a: 333; Bowie 2011: 63; Bowra 1961: 51; Brelich 1969: 136; Campbell 1983: 158–9; Carter 1988: 92–6; Podlecki 1984: 112; Priestley 2007: 189–90; Rose 1929: 406; Salapata 2009: 334 n.20; West 1965: 192. For arguments against the identification of the *Partheneion* goddess with Artemis Orthia see Page 1951: 77, Calame 2001: 5, and Segal 1983: 262. More recently, Ferrari reinitiated discussion on the topic, demonstrating that much is yet to be understood about the rite and the poem (2008).

102 Clark 1996; Page 1951. For a more detailed analysis of the history of the translation of *orthriai* and the identification of the poem's deity with (Artemis) Orthia see Miller 2009: 34–5, 41–52.

103 Page 1951: 24.

104 The earlier dates of the ninth or tenth century by Dawkins (1929: 7–10, 14, 17–18) and Rose (1929: 399) are now contested.

105 Rose 1929: 406.

106 ἄδειν τὸ παρασκευασμένον ἐγκώμιον τῆς Παρθένου αἱ ἐν τῷ χορῷ ἀκόλουθοι (Athenaios, *Deipnosophists* 14.646a; Bosanquet 1906a: 333).

107 Rose 1929: 406. For examples of such inscriptions see Woodward 1907–8: 75.

108 In boustrophedon: Ἐπανίδας ταῖ Πα(ρ)[θένοι ἀνέ]θεκε ϝορθά[ι] (Bosanquet 1906a: 333–4).

109 Des Bouvrie 2009: 159. On the later festivals, see Rose 1929: 406; Tillyard 1905–6: 36. On their date: Kennell 1995: 137.

110 Strabo 8.4.9 362c, cf. 6.3.3; Pausanias 4.4.2–3, cf. Bowie 2011: 47 n.26. There is indication that the sanctuary of Artemis Limnatis was identical to the Artemis Orthia sanctuary (Luraghi 2002: 54) although Calame disagrees with this identification (2001: 5, 157). If Luraghi is correct, the story entails further evidence of the role of young girls in the worship of Artemis Orthia and strengthens the argument in favour of the *Partheneion* describing an Artemis Orthia rite.

111 Carter 1987: 375; Dawkins 1929: 401 n.11; Rose 1929: [in Dawkins 1929] 401.

112 Carter 1988: 96 n.47; Daux 1973.

113 Wide 1893: 113, cf. Falb 2009: 131. E.g., the ca. 420 BCE inscription from Mt Hymettos mentioning Artemis Orthosia (Ἀρτέμιδος Ὀρθοσίας: *AM* 49, 1924, 15–16; cf. Falb 2009 n.128).

114 Falb 2009: 127, 145; Kennell 1995: 136. A seventh-century-BCE ivory plate depicting Artemis with a bird on one hand and a snake at her feet has also been interpreted as Artemis Orthia (Christou 1968: 145; Salapata 2009: 335). For more examples see Dawkins 1929: 104 Fig. 78b; Stibbe 1998: 71–3).

115 Artemis as the mistress of wild animals is established as early as Homeric times (Burkert 1985: 149). For the Spartan figurines see Dawkins 1929: 149, 205–8, 259–61, and associated Figures and Plates.

116 See Calame 2001.

117 πλήρης μὲν ἐφαίνετ'ἀ σελάν[ν]α, αἱ δ' ὡς περὶ βῶμον ἐστάθησαν: 'the moon was shining at the full, and they stood around the altar...' Sappho, *Frag.* 154 Voigt.

118 Pausanias 6.22.9.

119 Homer, *Iliad* 16.179–92; Philochorus, *FGrH* 328 F101. But other examples are to be sought also in Brauron and Karyai (Philochoros, *FGrH* 328 F101; Hellanicos, *FGrH* 4 F168a = Fowler fr.168; cf. Bowie 2011: 46 n.25; Calame 2001: 150. More examples of attempted or successful abductions of girls while dancing can be found in Bowie 2011: 46–7.

120 αἱ Πελειάδες, φησί Καλλίμαχος, τῆς βασιλίσσης τῶν Αμαζόνων ἦσαν θυγατέρες, πρῶτον δ' αὗται χορείαν καὶ παννυχίδα συνεστήσαντο παρθενεύουσαι (Schol. Theokritos, 13.25; cf. Segal 1983: 264).

121 Φαεσφορία, Kallimachos, *Hymn to Artemis* 10.
122 Des Bouvrie 2009: 164; Themelis 1994: 111–15.
123 Προσηώας, Farnell 1907: 460.
124 For a discussion on Orthia's association with dawn through her Near Eastern connections see Miller 2009: 51.
125 Themelis 1994: 105–8, 116; 1999: Figs. 73 and 74.
126 Depicting the goddess 'covered with a cloth called *faros*' (Themelis 1994: 116).
127 Plutarch, *Life of Theseus* 31.1–2. For more references on dancing, see Page 1951: 24.
128 Dawkins 1907: 75, 93–5; Parker 1989: 151; Pettersson 1992: 52.
129 E.g., Euripides, *Elektra* 467; Hyginus, *De Astronomica* 2.21.
130 Burnett 1964; Hooker 1979.
131 Pausanias 3.14. 6.
132 Calame 2001: 167 n.238; Dawkins 1929; Parker 1989: 151–2; Vernant 1991: 225–43.
133 Garvie 1965.
134 Monaldi 1991.
135 Cyrino 2004; Gentili 1988.
136 Further discussion on the problems of this identification can be found in Miller 2009: 37–9.
137 Ferrari 2008: 87, 106–7, 147–50.
138 Euripides, *Alkestis* 448–52; Plutarch, *Symposiacs* 717d; *IG* XII 3 *SEG* 1324.
139 The Gymnopaidia was held a lunar month earlier, ending during the full moon (Richer 2005: 247; Vrettos 2008: 404).
140 Cartledge 2003: 310; Dawkins 1907: 68.
141 Cartledge 2003: 309–10; Dawkins 1907: 68–9; 1929: 8, 49; Falb 2009: 132; Rose 1929: 399.
142 Bergquist 1967: 48–9; Cartledge 2003: 310; Dawkins 1929: 10, 19, 21, 34; Falb 2009: 131–2; Rose 1929: 399–400. The date of the eighth century BCE for the earliest temple given by Dawkins was contested in Boardman's more recent analysis. Boardman's dating, which dates the earliest traces of a temple to 700 BCE at the earliest, is now widely accepted (1963; Bergquist 1967: 47–9; Falb 2009: 132).
143 Dawkins 1907: 55; 1929: 32, 34; Rose 1929: 400, 404.
144 Kennell 1995: 111; Rose 1929: 406; Tillyard 1905–6: 361.
145 Bosanquet 1906b: 311–12; Dawkins 1929: 38.
146 Rose 1929: 399.
147 The entire constellation of Orion stretches from -15° (Rigel) to $+3^{\circ}$ (Betelgeuse).
148 Hesiod, *Works and Days* 383–7; Boutsikas and Ruggles 2011: 63.
149 The Pleiades, Sirius, and Orion were known to the Greeks since Homeric times (*Iliad* 18.487–90). In the Homeric epics, Orion is mentioned with admiration for his strength and as a constellation (*Iliad* 18.487), comparable to giants (*Odyssey* 11.308–10). The movement of the Pleiades had an extensive agricultural function in ancient Greece: their heliacal rising (the same time as the rite of the *Partheneion*) marked the time of harvest and their heliacal setting the time of sowing (Hesiod, *Works and Days* 383–4; see also Aratus, *Phaenomena* 254–67).
150 ὄρθρου ἀνιστάμενος (*Works and Days* 577). For earlier works which noticed this similarity, see Ferrari 2008: 86 and n.43.
151 Or less likely Sirius, while the Pleiades had already climbed high above the eastern horizon.
152 Pausanias 4.27.2–3, 4.26.6–7; Plutarch, *Lysander* 12.1; Sahlins 2011: 73.
153 Luraghi 2008: 235, 282 and n.122; Morizot 1994; Schoch 2009: 244; Themelis 1994: 101–7.
154 Luraghi 2008: 281.
155 The link of the altar and its temple with Artemis Orthia is confirmed by the numerous statues found inside the temple. The statue bases bear inscriptions referring to the priestess of Artemis or naming Messenian maidens associated with the Artemis Orthia cult (Damaskos 1999: 42; Luraghi 2008: 281–2; Müth 2007: 141–202; Themelis 1994: 101–22; 2003: 85–7).
156 For the image see Themelis 2003: 87–90, Fig. 78. For parallels, see Luraghi 2008: 125 n.84, 126.
157 Themelis 1998: 182–6.
158 Luraghi argues that this idea is strengthened by the presence of Archaic shrines in Messene dating to the early fourth century and the presence of a *perioikic* settlement in the area from the late seventh century onwards (2002: 58).
159 Luraghi 2002: 65.
160 Luraghi 2008: 281. On some indications which could associate Artemis with Asklepeios see Loube 2013: 101 n.528.
161 Damaskos 1999: 50–2, 225; Morizot 1994: 405; Müth 2007: 141–202; Themelis 2003: 74–6, 85–7.

162 On the positioning of the statues in relation to the temples and the altar see Schoch 2009: 244–5.
163 Schoch 2009: 305, Themelis 2004: 148.
164 Schoch 2009: 259, 303–4, 305.
165 Themelis 1994: 101. That lit torches were used during the festival of the Messenian Artemis is also confirmed in epigraphic evidence: e.g., πρὸ βωμῶν σῶν ἔτεινα λαμπάδα in Piolot 2005: 125.
166 Themelis 1994: 116.
167 Damaskos 1999: 50–2; Orlandos 1963: 128–9; Parisinou 2000: 81–2; Themelis 1994: 111; 2003: 134; 2014: 88.
168 4.31.10–11. The other two were Artemis Laphria, the statue of which he says he saw, but the location of the sanctuary has not been identified (Pausanias 4.31.7; Piolot 2005: 126 n.53); and Artemis Limnatis, whose sanctuary he knew of (Pausanias 4.4.2, 4.31.3). An inscription from a statue base depicting a priestess of Artemis Orthia mentions that the priestess held a torch before the goddess's altar (πρὸ βωμῶν σῶν ἔτεινα λαμπάδα) (Orlandos 1963: 128). On further ancient and modern references to these cults, as well as other possible cults of Artemis in Messene, see Piolot 2005: 121–9 and n.54–5.
169 Themelis 2001: 411; 2014: 88. For the inscriptions and their translation see Piolot 2005: 114 n.4, 123, 125; Schoch 2009: 242.
170 *SEG* 23.217 and 220. Οὐπησία is a variant of Οὔπις (fair-faced bringer of light) (Οὔπι ἄνασσ' εὐῶπι φαεσφόρε: Kallimachos, *Hymn to Artemis* 204). The epithet Oupesia is attested in Messene much later, in the first century CE (*SEG* 23.208 cf. Loube 2013: 102).
171 Brulotte 1994: 241–51; Felten 1983: 85–6; Sineux 1997: 9; Torelli 1998: 469–74. Piolot has argued that the word Phosphoros is more accurately described as an epiklesis rather than an epithet (2005, esp. 121–2). For the other names with which Artemis is invoked in Messene (e.g., Oupesia, Laphria, Limnatis, Hagemona) see Brulotte 2002; Piolot 2005.
172 Loube 2013: 102–3 and n.536.
173 Luraghi 2008: 282.
174 Shipley 2003.
175 2009: 120–3.
176 Luraghi 2008: 282. The introduction of the cult at the time of the Dorian invasion is implied by two inscriptions dating to the second or third centuries CE: *SEG* 23.215 and 217.
177 *Perioikoi* were the inhabitants of conquered cities in Lakonia and Messenia, who maintained a free status but worked as the merchants, traders, and farmers of the Spartans. Des Bouvrie 2009: 160.
178 Luraghi 2002: 45.
179 Pausanias 4.27.11.
180 Thucydides 4.3.3, 4.41.2. See also Luraghi 2002: 46 and n.5–6.
181 Not excluding the possibility of a simultaneous internal colonisation process, but only to a certain extent.
182 Luraghi 2002: 59.
183 Luraghi 2002: 68. The Messenian adoption of the cult of Artemis Laphria from Kalydon during the same time is another example of the Messenians structuring a newfound identity. On this see Solima 2013: 58–9.
184 Bremmer 1997: 14–5.
185 On this see also Solima 2013: 59–60. Bonanno goes as far as to suggest that Messenians deliberately omitted the name of their tutelary divinities as an attempt to distinguish their identity from the Spartans 'with whom they had been forced to share divinities and sacred space for too long' (2013: 67–8).
186 *SEG* 23.215 and 217.
187 Luraghi 2002: 50–5.
188 Luraghi 2002: 56–7, 65; Parker 1989: 145.
189 Segal argued that the comparison between bright Sirius and the dim Pleiades is in fact a paradox: Agido's light and Hagesichora's beauty together create a radiance against which the rest of the chorus cannot compete (1983: 270–1).
190 Burnett 1964; also followed by Ferrari 2008: 85 and Gianotti 1978.
191 E.g., 'When the Pleiades born of Atlas rise before the sun, begin the reaping; the ploughing, when they set' (Hesiod, *Works and Days* 383).
192 Burnett 1964; Priestley 2007: 192.
193 Hesiod, *Works and Days* 582–96.
194 The term 'citation' refers to a word or a thing; to make sense, it is necessary to 'reiterate components of previous sentences or objects' (Jones 2007: 55).
195 Luraghi 2008: 282. E.g., the Phylian heroes and all other hero cults.
196 Jones 2007: 7.
197 Sutton *et al.* 2011: 521.

198 For a discussion on the extended mind see Clark 1998: 99; 2001: 134; 2006a, 2006b: 371–2; 2008: 99; 2010; Sterelny 2010; Sutton *et al.* 2011: 525–7.

199 This kind of memory construction could be linked also to education. For Plato, choral dancing represented 'the entirety of education' (*Laws* 672e), and this does not seem too difficult to imagine when we compare it to the numerous examples of youth initiatory rites which involved dancing performances and would have been integrated as part of the ephebic *paideia* of boys and girls (e.g., in addition to the cults investigated in this chapter, also the Karneia in Sparta, Arkteia in Brauron, etc. For more such examples and their importance, see Calame 2001: 222–38). Knowledge of mythic detail has been interpreted by Ken Dowden as a sign of education and knowledge of culture (2012: 142), and Loucas-Durie argues that the Panathenaia contained an element of military education, in particular for the first stage of the military career of the Athenian *ephebes*, which was linked to Athena's role in the Gigantomachy (1989: 112). Furthermore, Connelly discusses how the myth of Erechtheus' daughters sacrificing themselves was invoked as an example of civic selflessness to inspire young men to be willing to die for the common good, and also as inspiration for honouring oaths (2014: 141–2).

200 Mylonopoulos 2006.

201 Ogden 2013: 214.

202 The name clearly signifies an association with 'time' (Ogden 2013: 79).

203 E.g., Pherekydes, *FF*73, 78–80 Schibli, cf. Ogden 2013: 78–9; Apollonius, *Argonautica* 1.495–511; Lykophron, *Alexandra* 119–7; Kirk *et al.* 2007: 66; West 1963: 161. Robert Graves identifies Ophion (the Pelasgian *demiurge*) with Kekrops, a link which further strengthens this argument (1960 vol. 1: 100). In an alternative version of the Gigantomachy, Ophion was the leader of the Giants who fought against Zeus and were cast into Erebos (Ogden 2013: 79). This version directly links Ophion with the Gigantomachy commemorated in the Panathenaia. These snakes of cosmic significance attest to the validity of Buxton's idea of the use of animals in Greek mythology as a means of thinking about the world (1994: 201–2).

204 *Pirithous*, *Frag.* 594.

205 Lines 13–18. Dated to ca. fifth century BCE.

206 In my view, Hurwit's excellent recent study of the pediment concludes the debate about the identity of the goddess as Selene, not Nyx (2017).

207 A very similar pairing of the two siblings is also present on either side of Athena's *chryselephantine* statue base inside the Parthenon to assign a temporal frame to Pandora's creation (Hurwit 2017: 547–8).

208 For recent discussions on this see e.g., Forsdyke 2012; Lape 2010.

209 Seen for example in the power of the Attic *genos* of Eteoboutadai, who traced their lineage back to the first kings of Athens.

210 Buxton's argument about the re-enactment of myth as a political act and on the power of myth to shape perceptions agrees with this conclusion (1994: 194, 213).

211 Clairmont 1971: 485–91. Also Calder 1969: 154–6.

212 Connelly 2014: 217–44.

213 Ferrari 2008: 118.

CHAPTER 6

1 E.g., Burkert 1987; Casadio and Johnston 2009; Cole 1984; Cosmopoulos 2003; Palagia and Wescoat 2010.

2 See, e.g., Graf 1974: 27 n.28; Mylonas 1974: 228, 231; Riedweg 1987: 47 n.81.

3 Bianchi 1979: 5. But consult also the very detailed discussion on the definitions and terminology of 'mystic' and 'mysteric' in Casadio and Johnston (2009: 1–6). The term 'mystery cult' was also defined locally with certain variations. See, e.g., Jost (2003: 144–6) for the case of Arkadia. Further elaboration on these terms and their meaning would be superfluous and beyond the scope of this work.

4 In relation to the impact of mystery initiation, Burkert talked about a 'change of mind through experience of the sacred' (1987: 11).

5 See, e.g., Burkert 1987: 43; Cole 1984; 1989.

6 Bremmer 1999: 50.

7 I am not referring to the promises for a better afterlife here, as it is difficult to assert the time of introduction of eschatological concerns to the initiation of any of the mysteries, even in Eleusis. See further in the chapter for a possible date of this addition being the sixth century BCE.

8 E.g., Graf 2003: 250.
9 E.g., Graf 2003: 244, 245.
10 Graf 2003: 250; Rogers 2012: 81–2, 131, 145.
11 Bremmer 2014: 18.
12 *Homeric Hymn to Demeter* 480–3; Pindar, *Frag.* 137; Sophokles, *Frag.* 837; Plato, *Gorgias* 493b; Cicero, *De Legibus* 2.36; Graf 2011.
13 270–4, 476.
14 *Hymn to Delian Apollo* 384–5, 443–8, 480–502, 523.
15 See also Cosmopoulos 2003: 5 Fig. 1.3, 8 Fig. 1.6.
16 Cosmopoulos 2003: 7–8, 17–19. For an account of the Mycenaean structures which appear in the Middle Hellanic period see Mylonas 1974: 29.
17 Cosmopoulos 2003: 3, 12.
18 Binder 1998: 132; Clinton 1992: 29; 1993: 114; Cosmopoulos 2003: 8, 17–18; Miles 1998: 21.
19 Cosmopoulos 2003: 7–8, 16–19.
20 Binder 1998: 131, 132; Sourvinou-Inwood 1997: 133, 134; 2003: 45 n.3.
21 Nielsen 2017: 34; Vanderpool 1982. The threshing floor is also mentioned in an inscription dating to 320 BCE (*IG* II^2 1672, line 233 = I. Eleusis 177).
22 Cavanaugh 1996: 211–12; Ustinova 2013: 105.
23 Eusebius, *Praeparatio Evangelica* 3.120; Bremmer 2014: 2.
24 Sourvinou-Inwood 2003: 26–8.
25 Plato, *Gorgias* 497c; Plutarch, *Demetrios* 26.2; *IG* I^3 6 B 36–47; Burkert 1983: 265 n.2; Mommsen 1898: 406.
26 Chandor 1976: 139; Kerényi 1967: 45; Mikalson 2010: 118 n.8; Robertson 1996b: 359.
27 *Hymn to Demeter* 446–7; Robertson 1996b: 346–7. Although a scholiast on Aristophanes states that 'The Greater Mysteries were Demeter's and the Lesser Persephone's' (cf. Mylonas 1974: 240), it seems that both goddesses were believed to be present in the Lesser Mysteries, as is confirmed by the fragment of Douris: 'The goddess Demeter is coming to celebrate her daughter's Mysteries' (cf. Mylonas 1974: 239–40).
28 Livy, *Ab Urbe Condita* 31.14.7–9; Parker 2005: 346.
29 Parker 2005: 331.
30 *IE* 19 (=*IG* I^3 6) cf. Bowden 2010: 229.
31 Miles 1998: 1; Mylonas 1974: 245.
32 Miles 1998: 16–18.
33 Miles 1998: 25–8, 33.
34 This appears to be the case since Pausanias discusses the temple in detail in his account of the sanctuary (1.14.3–4). See also Miles 1998: 44, 50.
35 Miles 1998: 44, 51.
36 E.g., Sophokles, *Antigone* 1146–7; Euripides, *Ion* 1074–86; Aristophanes, *Frogs* 342–3.
37 Ovid, *Fasti* 4.535–6; Burkert 1985: 287. But also an interesting reference to Iakchos (the Eleusinian Dionysos) as 'the light-bringing star of our nocturnal rite' (Aristophanes, *Frogs* 342–3) and the identification of Plouton as a 'conspicuous star' (Pindar, *Olympian* 2.53–83). See also Seaford (2010: 203) for more on Eleusinian associations of stars and the sun.
38 *Antigone* 1147; Seaford 2010: 203.
39 Seaford 2010: 203. ἀστροφαῆ Διόνυσον ἐν ἀκτίνεσσι πυρῶπον D.S. 1.11.3, cf. Seaford 2010: 205 n.11.
40 ἐξορχεῖσθαι in Lucian, *De Saltatione* 15: Ἐῶ λέγειν, ὅτι τελετὴν οὐδεμίαν ἀρχαίαν ἔστιν εὑρεῖν ἄνευ ὀρχήσεως, Ὀρφέως δηλαδὴ καὶ Μουσαίου καὶ τῶν τότε ἀρίστων ὀρχηστῶν καταστησαμένων αὐτάς, ὥς τι κάλλιστον καὶ τοῦτο νομοθετησάντων, σὺν ῥυθμῷ καὶ ὀρχήσει μυεῖσθαι. ὅτι δ' οὕτως ἔχει, τὰ μὲν ὄργια σιωπᾶν ἄξιον τῶν ἀμυήτων ἕνεκα, ἐκεῖνο δὲ πάντες ἀκούουσιν, ὅτι τοὺς ἐξαγορεύοντας τὰ μυστήρια ἐξορχεῖσθαι λέγουσιν οἱ πολλοί. Also in Lucian, *Piscator* 33; Euripides, *Ion* 1074–89; Arrian, *Epictetus* 3.21.16; Clement, *Protrepticus* 2.12.1.
41 *SVF* I, no. 538; Burkert 1983: 288.
42 Also the Hydria from Istanbul, Kerényi 1962: pls. 37 and 2; Metzger 1951: pl. 32; cf. Burkert 1983: 288 n.66.
43 Aristophanes, *Frogs* 340–4; Mylonas 1974: 261–3, 272; Sourvinou-Inwood 2003: 29–31.
44 Lactantius, *Divinae Institutiones* 23; Clinton 2003: 67.
45 Sourvinou-Inwood 2003: 44.
46 Sourvinou-Inwood 2011: 107–8.
47 Sourvinou-Inwood 2011: 131.
48 Jameson deduces that the sacred truce commenced at this time (*IG* I^2 6.76–87) and the timing of the Anthesteria would fall on the tenth to the thirteenth of the month (1965: 160 n.3). Other scholars place the principal date of the Lesser Mysteries on the twentieth (e.g., Mommsen 1898: 406). Plutarch only names the month (*Demetrios* 26.1).
49 ἰσόμοιρά τ' εἶναι ἐν τῷ κόσμῳ φῶς καὶ σκότος, Diogenes Laertius 8.26; also in Aristotle, *Metaphysics* 1.986a22; Boutsikas in press.

50 Sv Προηροσία = Klei(to)demos of Athens, *FGrH* 323 F 23. Brill's New Jacoby argues that the evidence for the two festivals being the same is not certain (Anonymous on Delos (de Delo, ex Lycurgo) (401c) F3), but the celebration of the Proerosia on 5 Pyanopsion falls indeed a few days before the time of the heliacal rising of Arktouros (which occurred around 2 October, thus at the end of the previous month). Προηροσίαι· αἱ πρὸ τοῦ ἀρότρου γινόμεναι | θυσίαι περὶ τῶν μελλόντων ἔσεσθαι | καρπῶν, ὥστε τελεσφορεῖσθαι. ἐγίνετο δὲ | ὑπὸ Ἀθηναίων ὑπὲρ πάντων Ἑλλήνων. F3 Suda, sv Προηροσίαι (π 2420 Adler) *Proerosiai*: 'The sacrifices taking place before the ploughing | concerning the future crops, | so that they may come to fruition. [These sacrifices] were performed | by Athenians on behalf of all Greeks.'

51 Katasterismoi 9. The movement of Spica is also recorded in the Hibeh 27 papyrus, as rising on the sixth day of the Egyptian month Pachon (Lehoux 2007: 221). Hipparchos was believed to have discovered the Precession of the Equinoxes in the second century BCE by comparing earlier observations of Spica to his own.

52 Hyginus 2. 25. Ptolemy's later description of the stars of Virgo is in *Tetrabiblos* 1.9.

53 *Phaenomena* 96–7; Kidd 1997: 216.

54 Van der Waerden 1974: 81.

55 Sachs 1952: 146, cf. van der Waerden 1974: 101.

56 Aratus, *Phaenomena* 138; Hipparchus, *In Arati et Eudoxi Phaenomena* 2.5.5, 3.1.4.

57 Evans and Berggren 2006: 277; Webb 1952: 31.

58 E.g., *A.xvii*. Paris, *A.xii*. Madrid, *A.vi*. Columella, etc. See Lehoux 2007.

59 Lehoux 2007: 81–2, 234.

60 Evans and Berggren 2006: 233, 270 n.e, 280; Lehoux 2007: 233.

61 *Suppliant Women* 29–31.

62 Aristides, *Panathenaicus* 38; Pindar, *Olympian* 9.150b and c; cf. Parker 2005: 202.

63 Burkert 1983: 286–7; Sourvinou-Inwood 2003: 40–1.

64 A priest of Dionysos in Alexandria, third century BCE.

65 Körte 1931: 446, line 48, cf. Kerényi 1967: 43.

66 *Orphic Hymn* 31; Hippolytus, *Refutation of All Heresies* 5.8.39–41; Bremmer 2014: 15; Henrichs 1975, 1984.

67 E.g., Euripides, *Suppliants* 54; Hippolytus, *Refutation of All Heresies* 5.8.39–41, cf. Burkert 1983: 288–90.

68 Bremmer 2014: 15.

69 Hippolytus, *Refutation of All Heresies* 5.8.39–40; Burkert 1983: 273; Sourvinou-Inwood 2003: 35–7. 'The Athenians, while initiating people to the Eleusinian Mysteries, similarly show to those admitted as *epoptai* the great, admirable, most perfect secret, … in silence, a reaped ear of grain' (Hippolytus, *Refutation of All Heresies* 5.8.39); Varro in Augustine, *City of God* 7.20; Burkert 1987: 80–1 and n.87, 100; Bremmer 2014: 18). Ploutos may have also been associated with these moments as the personification of wealth (*Homeric Hymn to Demeter* 487–9; Clinton 1992: 91–5).

70 *Homeric Hymn to Demeter* 208–10; Burkert 1985: 286; Cosmopoulos 2015: 18–21.

71 *Refutation of All Heresies* 5.8.39–41. Hippolytus describes a ritual taking place on the last day of the Mysteries, during which two *plemochoai* were filled and poured out, one in the west and one towards the east, at the time the initiates stretched their hands towards the sky, shouting 'rain', and down towards the earth, shouting 'conceive' (Proclus, *In Platonis Timaeum commentaria* 3.176.26–30; *HN* 293; Kritias, *Tragicorum Graecorum Fragmenta* F 2; Athenaios, *Deipnosophists* 11.496a–b; Burkert 1983: 293 and 1985: 289). For the vessels see Clinton 2009; Krauskopf 2006; Miles 1998: 95–103; Mitsopoulou 2010, with a unique representation of the ritual at 168–72.

72 *Homeric Hymn to Demeter* 398–403.

73 Burkert 1987: 85.

74 Burkert 1987: 90.

75 *SVF* 1 no. 538.

76 Transl. Burkert. Sopater, *Rhetores Graeci* 8.114.23–8, 7.115.1, cf. Burkert 1987: 90 and Clinton 2004: 92–3.

77 Plato, *Phaedrus* 247c; Burkert 1987: 92–3.

78 Aristotle, ap. Synesius, *Dio* 8; *Orat.* 48; Ustinova 2013: 108–10 and n.30.

79 Plato, *Phaedrus* 250c–15a.

80 Relevant evidence based on clues from ancient texts (e.g., Lucian, *Kataplous* 22; Plutarch, *Frag.* 178 (Sandbach)) on this experience being part of the initiation is discussed elsewhere (e.g., Ustinova 2013; Wasson *et al.* 2008: 53–7).

81 In Plutarch, bright light comes to meet the initiates (Plutarch, *Frag.* 178 (Sandbach) or Plutarch, *Frag.* 168 (=Stob.4.52.46); Lactantius, *Divinae Institutiones* 23, cf. Clinton 1993: 118–19; Sourvinou-Inwood 2003: 30).
82 Plutarch, *Frag.* 178; Proclus, *Theology of Plato* 3.18; Plutarch, *Agesilaos* 24.7; Lucian, *Cataplus* 22; Aristophanes, *Frogs* 285–322. For shuddering: Cairns 2013: 100–1.
83 251a.
84 E.g., Aristophanes, *Clouds* 610–19.
85 Sourvinou-Inwood 2003: 40.
86 *IG* II^2 4058 [=*I. Eleusis* 399], cf. Clinton 2004: 93.
87 Pausanias 8.25.7, 8.37.9.
88 8.37.9.
89 Nilsson 1906: 346.
90 Durie 1984: 136.
91 Jost 1985: 173.
92 Kourouniotis 1912, cf. Jost 1985: 174–5.
93 Jost 1985: 175; Lehmann 1964.
94 Jost 2003: 165 n.5; Loucas and Loucas 1988: 29.
95 8.37.8–10.
96 Jost 1985: 177, 178; 2003: 148–50; Kourouniotis 1912: 154; Loucas and Loucas 1988: 29.
97 Jost 2003: 149; Kourouniotis 1912: 148.
98 Burkert 1985: 280.
99 Jost 2003: 161.
100 Jost 2003: 149; 2006: 499.
101 Orlandos 1967–8: 44 n.1, 45.
102 Loucas-Durie 1992: 87.
103 Nielsen 2002: 108.
104 Mylonopoulos 2006: 96.
105 Jost 2003: 149; 2006: 499; Loucas-Durie 1992: 88; Mylonopoulos 2006: 96.
106 Jost 2003: 157–9.
107 Mylonopoulos 2006: 95.
108 Becker 2003: 234 n.106; Mylonopoulos 2006: 95–6.
109 Ginouvès 1972: 68; Jost 2003: 149; Orlandini 1969–70: 354–7.
110 Bather and Yorke 1893: 228; Loucas and Loucas-Durie 1985–6: 563; Parisinou 2000: 98.
111 8.37.6.
112 Dickins and Kourouniotes 1906: 395. Jost disputes the interpretation of Despoina's cosmic role based on this decoration and argues instead that these themes were common in Hellenistic art (1970: 148; 1985: 334).
113 Pausanias 8.37.2, 8.37.7.
114 Jost 2003: 154, 155, 164; Kantirea 2016: 34.
115 Jost 2006: 500.
116 For an excellent discussion on the function of epiphany in various contexts, including ritual, consult Platt 2015.
117 Herodotos 2.51.2–3.
118 The Forecourt was monumentalised later by Ptolemy II.
119 Cole 1984: 26; 1989: 1574.
120 10.3.7; Clinton 2003: 62–3; Dimitrova 2008: 245.
121 Clinton 2003: 65, 74 n.49; Wescoat 2012: 93–9. For *thronosis* as a preliminary rite of initiation see Plato, *Euthydemos* 277d. For a helpful 3D reconstruction of the Theatral Circle, the adjacent prostyle, and surrounding area, see Wescoat 2017: 71.
122 Clinton 2003: 65, 74 n.50.
123 For evidence of lamps from the sanctuary, see Lehmann 1998: 39–41, 140. For the use of torches, Lehmann 1969, Text I: 135–7. For torch-stones and nocturnal rites, Lehmann 1969, Text II: 13, 17–19, 31–2, 54–5, 73–4. See also Wescoat 2017: 83 n.37.
124 Wescoat 2012: 75–6.
125 Anderson and Stoddart 2007: 41–2.
126 Wescoat 2017: 69–70.
127 Wescoat 2017: 72, 74.
128 Wescoat offers an excellent reconstruction of the pilgrim's experience from the ancient city to the sanctuary's *Propylon* and subsequently to the Theatral Circle and procession to the Hall of Choral Dancers (2017: 75–9).
129 A similar sensory-deprived descent into the earth was also discussed in the example of the oracle of Trophonios.
130 Consult Clinton (2003: 61 and n.43) for justification of this conclusion.
131 Clinton argues that the word *Hieron* should be used to refer to the most sacred area of the sanctuary, not just the structure (2003: 61–2).
132 Burkert 1985: 283.
133 Clinton 2003: 61.
134 Clinton 2003: 61, 67. Clinton concludes this based on the theme of the frieze depicting dancers, which according to his argument should be linked to the function of the structure. The dances are explicitly mentioned in the ancient sources: Kritolaos, *FGrH* 823 F1; Statius, *Achilleid* 1.830.
135 The extant structure dates to 340–330 BCE, but replaced an earlier stone altar. Bremmer 2014: 25; Lehmann and Spittle 1964; Mylonopoulos 2006: 98.
136 Bremmer 2014: 31.

137 Burkert 1985: 283; Fraser 1960: 118–20 and n.63.
138 Clinton 2003: 61. Burkert, on the other hand, based on the presence of benches along the east wall, believed that this was an initiation structure (1985: 283).
139 Burkert 1985: 284.
140 Clinton (2003: 67) quotes Ephorus, *FrGrH* 70 F 120. The similarities between the two mystery cults were also observed by ancient authors in later periods (Diodorus Siculus 5.77.3; Bremmer 1995: 71).
141 Schol. Apollonius Rhodius, *Argonautica* 1.917. Bowden argues against the identification of the Samothracian gods with the Kabeiroi (2010: 63) and uses instead the Eleusinian Mysteries to assist in interpreting the Samothracian (2010: 64).
142 Graf 2003: 244, 245.
143 Aristophanes, *Peace* 277–8 with scholia relating to *Peace*; Apollonius Rhodius, *Argonautica* 1.915–18; Diodorus Siculus 4.43.1–2, 4.48.5–7, 5.94.5.
144 Nonnus, *Dionysiaca* 3.35–4.248.
145 Clinton 2004: 93 and n.27. For the inscription see Karadima-Matsa and Dimitrova 2003. Further evidence on the importance of light, albeit from a late source, can be found in Valerius Flaccus, *Argonautica* 2.439–42.
146 '[B]ut you, gloomy Hades, extremely powerful bastion of necessity, lead this man to the Region of the Reverent and place him there' (Isidoros, document 29; transl. Dimitrova 2008: 244).
147 Dimitrova 2008: 244–5.
148 *Orationes* 12.33.
149 *De Lingua Latina* 5.10.57–8, cf. Lehmann *et al.* 1959: n.175. For more detailed discussions on symbols supporting the interpretation of a sexual union consult Burkert 1993: 181–2; Clinton 2003: 68–9. Consult also Lehmann-Hartleben (1939: 138) for a detailed description of finds.
150 Hemberg 1950: 126–8; Valerius Flaccus, *Argonautica* 2.437–42, cf. Burkert 1985: 283.
151 Dimitrova 2008: 73, 249.
152 Cole 1984: 39.
153 Dimitrova 2008: 248.
154 Bremmer 2014: 23; Schroeder 2012: 322–4.
155 Converted from inscription dates listed in Dimitrova 2008: 245–6.
156 The July date of initiation does not survive in the inscription.
157 A number of lists mention the Dioskouroi along with the Samothracian gods. Chapouthier (1935: 181–2) cites a round offering table from 159/8 BCE, dedicated by a priest of the Great Gods and Dioskouroi and Kabeiroi; in 158/7 BCE, an Athenian held the priesthood of the Great Gods, Dioskouroi, and Kabeiroi; in 101, a ship in honour of Mithridates was consecrated to the Great Gods of Samothrace Dioskouroi Kabeiroi. On the other hand, the altar of Artemidoros in Thera distinguishes between the Dioskouroi and the Samothracian gods as testified by the presence of two separate altars (Cole 1984: 63). For inscriptions mentioning the Dioskouroi alongside the Samothracian gods see 153–4 (Delos), 155 (Rhodes), 167 (Fasilar), cf. Fraser 1960.
158 Converted from inscription dates listed in Dimitrova 2008: 245–6.
159 For the numbers on the *mystai* lists used for these deductions see Dimitrova 2008: 245–6.
160 Dimitrova 2008: 78.
161 Hippolytus, *Refutation of All Heresies* 5.8.9–10.
162 Burkert 2002: 46–7.
163 Blakely 2011: 62.
164 Wescoat 2012: 92–3.
165 Wescoat 2012: 98. Goudeli's description of the Samothracian landscape aptly links these ideas of death, rebirth, and cyclical flow with the abundant springs, crevices, waterfalls, and gorges of the volcanic but forested Samothracian topography (2001: 299).
166 E.g., Aristotle, ap. Synesius, *Dio* 8; *Orat.* 48; Bellman 1984: 86–8; Picton 1990: 194; Ustinova 2013: 108–10 and n.30.
167 Aristotle, *Frag.* 15 Rose (Synesius, *Dio* 10), Ἀριστοτέλης ἀξιοῖ τοὺς τελουμένους οὐ μαθεῖν τι δεῖν ἀλλὰ παθεῖν καὶ διατεθῆναι, δηλονότι γενομένους ἐπιτηδείους, cf. Dio Chrysostom, *Orationes* 12.33.
168 The early-imperial marble ash-urn (Urna Lovatelli) held in Palazzo Massimo in Rome presents three scenes of Herakles' mythical initiation probably into the Eleusinian Mysteries. In one scene, he is depicted seated with his head and shoulders entirely covered by a cloth. This late depiction confirms the importance of sensory deprivation persisting throughout the life of the Eleusinian Mysteries, even in the later periods.
169 10.3.9, trans. H. L. Jones, Loeb.

170 Pindar, *Threnoi* Frag. 137 Maheler (= Frag. 62 Cannatà Fera), cf. Bernabé 2016: 37.
171 Chaniotis 2013: 177–80.
172 Clinton 2003: 66–70; Ustinova 2013: 107.
173 *Argonautica* 2.439–42.
174 LSS 25, cf. Chaniotis 2013: 182 n.54.
175 398–403.
176 Foley 1994: 93.
177 Guthrie and Guthrie 1962: 358, 471–2; Leszl 2007: 43; cf. *Ethics* 193 [F67] in Graham 2010: 633.
178 As Platt very accurately points out, 'epiphanies are inevitably culturally meditated' (2015: 493).
179 Beck 1998; 2000: 157–63; Turcan 1993: 80–1. *De Antro Nympharum* 24: 'To Mithras as his proper seat, they assigned the equinoxes.' On the passage, see Beck 1976: 95.
180 Boutsikas 2017.

CHAPTER 7

1 Hillier 1996: 215; Hohmann-Vogrin 2006: 200.
2 Ustinova 2009.
3 The idea of this triple code was put forward by Burkert (1985: 227).
4 Wescoat and Ousterhout 2012: 367.
5 Junker 2012: 55–9.
6 Friese 2010a: 336.
7 Wescoat interprets the use of Corinthian order in the *Propylon* as a symbol of interiority and regeneration, or even rebirth (2012: 98–9).
8 Wescoat and Ousterhout 2012: 373.
9 Eidinow 2011: 17. For an excellent paradigm of the importance of environment and sensory deprivation in shaping experience see Friese's study on necromantic experience (2010b).
10 Smith 1992.
11 Gould 2001: 203–34; Kindt 2012: 15, 77, 81.
12 Hamilakis 2014: 167–8.
13 Gagné 2011: 130.
14 In fact, Geertz calls religion 'one of the most powerful cultural institutions ever created by sapiens minds' (2010: 317). As Eidinow remarks, 'institutions rarely exist in isolation'. Instead, they coexist and overlap (2011: 18).
15 Geertz 2010: 307.
16 Andersen et al. 2019: 53.
17 The difficulty of defining the human mind has been recognised by philosophy and has recently been made explicit in cognitive and social neuroscience. See, e.g., Ingold 2007, 2008; Knappett 2002, 2007; Malafouris and Renfrew 2010; Olsen 2003; Webmoor and Witmore 2008.
18 Xygalatas *et al.* 2013: 11–13. For earlier research on this see Whitehouse 1992, 2004.
19 Sutton *et al.* 2011: 526.
20 Hellström 2009.
21 Mylonopoulos 2006: 107.
22 For a discussion of such devices dating to the Roman period, see Rüpke 2013.
23 Leduc 2009: 163.
24 Sterelny 2010.
25 E.g., Feld and Basso 1996; Hamilakis 2014: 168–70.
26 Sutton *et al.* 2011: 526.
27 Sterelny 2010: 479.
28 Sutton *et al.* 2011: 537.
29 There are many examples of such studies. The one of the educational value of the myth of Prometheus as presented by Aeschylus through the lens of psychoanalytic thought is an excellent paradigm of the value of myth in constructing world views (Williams 2013). Supplementary to this analysis is also Kechagias and Boutsikas 2018.
30 Bourdieu 1977: 94–5.
31 Bourdieu 1977: 94; Tilley 1994: 33. With further discussion in Hamann 2002: 353.
32 In Bourdieu's words, the link between 'a whole group and a whole symbolically structured environment' (1977: 87).
33 Bourdieu 1977: 87–8.
34 It is indeed possible that these mechanisms are successful because they manage to 'suppress individual cognition' and promote instead established religious narratives and interpretations (Schjoedt *et al.* 2013: 49).
35 Jones 2007: 25.

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