

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 *paraepgmata* 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 Hibe *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 veni 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