

Introduction

The early 21st century, in the wake of the developments in the second half of the 20th, can be confidently defined as a period of eclecticism in its approach to myth; the same applies to the apparently polyparadigmatic field of study of religion in antiquity, which naturally includes the study of Greek myth.¹ However, some approaches are unsurprisingly favoured on account of others—those more in accordance with current scholarly sensibilities—while others are considered outdated or superseded by more appropriate ones. Thus, even in eclecticism and polyparadigmaticism there is a relatively clearly defined centre and margin. This seems the only way in which research can properly function and is thus hardly controversial; but one should always be aware of the commitment—for various reasons—to a dominant paradigm and its ideological background as important factors in streamlining current research. Concomitant to this, one should also be aware of the often-ideological background in discarding earlier scholarship, occasionally based on inadequate research and hastily accepted by the majority of scholars in order to ‘move on’ unhindered by the often silly—in hindsight—and methodologically flawed approaches of the past. Once again, this seems to be the way in which research regularly develops, but it does not seem as non-controversial as the preceding point on the centre-margin relation in polyparadigmaticism. In itself, this does not entail that the current approaches are in some way flawed; but it does suggest that their attention is perhaps too heavily focused on some facets of evidence on account of others and that some lines of evidence are considered irrelevant on incompletely justified grounds. It seems that precisely those categories of evidence that were central, or at least very important, to earlier approaches, are considered peripheral to those that succeeded them and now dominate the field. This does not evaluate properly their relevance (neither did their central place in earlier paradigms), but more correctly measures the interest of current scholarship and the preoccupations of researchers working under a dominant paradigm, or rather the central core of a polyparadigmatic system. This has an unwanted consequence of leaving the body of evidence—and its interpretation—central to a once dominant paradigm in the state of research appropriate for the time,² which puts it in an unfair position in comparison with the evidence appropriated by current research. The subject of solar movement, especially its annual aspect, as envisaged in myths, is a prominent example of such practice. Once both an attractive field of study and an important interpretative

tool, it is now considered a subject almost unworthy of serious scholarly engagement. In addition, another reason for its peripheral status in current research is its technical nature, which seems to have restrained modern scholars from engaging with this subject. Finally, with the move from substantive to socio-cultural framework of interpretation of religion,³ the ‘physical’ content of myth was overshadowed by other concerns. These circumstances leave the subject of solar movement mostly in the hands of amateur researchers,⁴ which, in its turn, in a vicious circle even more downgrades the potential attractiveness of the subject for the researchers working under the current polyparadigmaticism, i.e., it relegates it to a distant margin of scholarly interest frequently tainted by ‘unscientific’ and ‘unserious’ feelings it evokes.

It seems inevitable that the once discarded interpretative approach is marginalised together with the body of evidence it once held central for its paradigm. The treatment of (especially annual) solar movement in myths is a particularly illuminating example of such practice. It was once the main pillar of the solar-myth (or nature-myth in a wider sense) school that dominated the 19th-c. discussions on the subject, which culminated in W. H. Roscher’s work, especially his famous *Mythologisches Lexicon*.⁵ Despite the heavily ideologised dismissal of the solar/nature-myth paradigm,⁶ as well as the inadequacies of its rival and conqueror, the anthropological-fertility paradigm, the eccentricities of the former frequently did not require an especially meticulous criticism in order to be refuted. But since the threat in the form of solar/nature-mythology no longer lurks in the background (it was already long-dead when R. Dorson in 1955 wrote an article titled ‘The Eclipse of Solar Mythology’), it seems an opportune moment to attempt to reassess some of its subject matter, emancipated from the interpretative method that was convincingly proven to be inherently unusable.⁷

¹ On the concept of paradigm in the humanities see Ober 1989: 136–37 and Versnel 1994: 11–14, 86 (= 1990a: 65). On the eclectic approach to the study of myth see immediately below.

² Cf. Goodison 1989: xiii, citing M. L. West’s inaugural lecture of 1975; Hämeen-Anttila 2006: 6.

³ Versnel 1994: 7–11. For the ideological background of the denouncement of intellectualist explanations of religion by modern scholars see Horton 1968: 629–32 and Versnel 1994: 8 n. 13.

⁴ Such as Bailey 1997; 1998.

⁵ Versnel 1985–86: 134–35 = 1994: 289–92; Konaris 2010: 484–87; 2016: 123–30.

⁶ See Dorson 1955; Arvidsson 2006: 125–31, 168–73, 176; Konaris 2010; 2011; 2016.

⁷ For a consensually negative assessment of the work of the leading exponent of solar-myth theory, F. M. Müller, see Dorson 1955: 394–405; de Vries 1984[1967]: 36–40; Kirk 1974: 43–44; Rogerson 1974: 34–36, 40–43, 56, 176; Ackerman 1975: 116–17; Dowden 1992: 18–19; Davidson 1993: 146–48; Graf 1993: 25–26; Turner 1993: 346–47; Lincoln 1999: 67; Von Hendy 2001: 78–83; Segal 2004: 20; Csapo 2005: 19–30; Arvidsson 2006: 73, 76–83, 87–90, 127, 130–31, 311; Calame 2009a: 23–24; Konaris 2016: 106–23.

In general, I will attempt such a reconsideration of some of the subject matter treated by the solar/nature-mythology, although my emphasis will not be on the actual source-material gauged by the 19th-c. scholarship faithful to this paradigm, since most of it was constructed by the proponents of the paradigm themselves by strained or completely implausible interpretations. Thus, this essay is intended as a reintroduction of the study of 'solar' material engaged by myth into mainstream scholarship, but without the package of discarded and untenable interpretative approaches. In doing this I will decidedly focus on Greek myth, but will occasionally incorporate material from other ethnographic contexts, in the first place the Mesopotamian and, in a lesser measure, Egyptian. At the same time, I will not offer a monolithic theory of myth, but only an interpretation of a provisionally yet clearly defined group of traditional narratives in their respective ethnographic contexts—in the first place a group of Greek narratives and their particular cultural setting.

More specifically, I will try to provide an analysis of the presence of the results of the observation of diurnal and annual solar movement, as well as other related phenomena (such as the fixed, i.e., geographical, arctic circle),⁸ in certain narratives, in the first place those that are customarily classified as myths. This presence manifests itself in two different ways: as incorporation of motifs drawn directly from the observation and/or interpretation of solar movement (representing the main body of evidence) and as actual narratives built upon solar movement (represented by a modest number of stories). In addition, I will study the perpetuation of this presence in those texts usually understood as closer to the modern scientific standard.

With respect to the latter category (the narratives built upon solar movement), the spiral of scientific development⁹ has now, I believe, reached the point when some of the central preoccupations of 'solar mythology', devoid of its extremist and extravagant interpretative environment, can be reintroduced into discourse on ancient beliefs, certainly not as forcefully as when it dominated the field, but only as a useful hermeneutic approach in certain rigorously selected cases.¹⁰ An obvious and very pertinent case in point is the anthropomorphisation of celestial bodies, in the first place the sun, and the explanation of their movements and related phenomena in terms of human behaviour. What I am arguing for here is simply an acknowledgement of the fact that the interpretation of some mythic motifs, episodes or narratives in terms of solar movement can be justified if applied selectively and judiciously. Indeed,

this type of interpretation is widely if implicitly accepted in the treatment of such straightforward myths as that of Helios' journey in his chariot or cup, but the hermeneutic principles involved in such an interpretation are rarely followed out to their logical end.

Without taking into consideration the now often neglected substantive facet of mythic motifs, narratives and clusters of stories, notably those referencing solar movement discussed in the main part of this book, the fertility, shamanistic,¹¹ ethological or sociobiological,¹² myth-ritual¹³ or initiatory¹⁴ paradigms fail to provide a framework for persuasively explaining, for example, the Laestrygonian episode from the *Odyssey*, which will be treated in chapter 2 of this study, even though I readily accept that some of these interpretive approaches can cogently explain at least some portions of the traditions discussed here (including the Laestrygonian episode).

The substantive facet of the myths that will be studied in this essay, i.e., their subject matter, will in the course of time become the object of study of the newly-emerged disciplines of geography and astronomy. Considering the widely diverging understandings of basic terminology and the concepts behind it, it seems fair to say that deciding whether there is any relation between myth on one side and geography and astronomy on the other (the two disciplines which jointly treated the problem of solar movement) in the first place depends on the definition of myth one accepts, as well as on the definition of science.¹⁵ The aspect of this relation in which I am interested pertains to the potentially shared subject matter, more precisely, the common segments of the respective objects of study shared by these two intellectual strategies, but also, in a lesser measure, to their potentially corresponding approaches and goals, in the first place to the question whether myth can have and was intended to have a descriptive and explanatory function (as science certainly by definition did and still does). In this context it is important to emphasise that I

¹¹ On which see the refutation in Bremmer 2002: 27–40, 145–51; 2016; 2018 and Zhmud 2012: 207–12.

¹² This approach is mainly championed by W. Burkert, on whose work see Versnel 1990a: 61–62, 64–65 = 1994: 77–79, 83–84, Csapo 2005: 163–80 and Iles Johnston 2018: 50–52; on the ideological background of the 'biological' in 'sociobiological' see Csapo 2005: 162, 172 (on the 'social' see below).

¹³ Convincingly criticized by Fontenrose 1971; cf. Iles Johnston 2018: 34–55, 57–63.

¹⁴ For the rise of the initiation paradigm and its supplanting of the earlier fertility paradigm see Graf 2003: 5–6, 19–20 (cf. Versnel 1990a: 50 = 1994: 59 and Fowler 2013: 174); for its ideological roots see Graf 2003: 6, 8, 19–20 and Lincoln 2003, esp. pp. 249–50; for its diminishing relevance see Graf 2003: 20 and Lincoln 2003: 250; for an analysis of its approach to myth from an emic and reflective perspective see Graf 2003: 15–19.

¹⁵ The Greeks of the early period would have used the term 'meteorology' for the discipline that treated solar movement; I will not use this term, since it would be confusing to modern readers, who expect something else of this discipline. At the same time, when I use terms such as 'astronomy' and 'geography' in discussing pre-Hipparchean material, I am aware of the anachronistic character of such practice. When used in this context, the terms such as 'astronomical concepts' or 'geographical tenets' must be understood in a qualified sense, but I believe it would be pedantic to qualify them on every occasion.

⁸ The geographical (fixed) arctic circle is at a latitude corresponding to a polar distance equal to the obliquity of the ecliptic (i.e., at ca. 66°30'), while the arctic circle in Greek sense (i.e. an always-visible circle) varies with latitude.

⁹ Ackerknecht 1954: 124–25, cited in Versnel 1990a: 66–67 = 1994: 87–88.

¹⁰ Compare Goodison 1989 for a similar approach in a compatible field of study and Fowler 1993: 41 for a plea for reintroduction of myth-and-ritual paradigm—not in its original form, but naturally updated to modern standards—in the study of myth.

am going to treat ancient scientific and narrative accounts of solar phenomena concurrently not with respect to their accuracy, i.e., their correspondence with objective reality, but as attempts at description and explanation (with differing accents of these respective approaches on these two activities) of the specific phenomena of physical reality. At the same time, I will put an accent on narrative accounts, given that the scientific ones are easily understandable (with the exception of some controversial points, which will be treated in detail), since they are given in an idiom almost identical to the one used in modern western scientific culture, its direct descendant.

Naturally, the observation and interpretation of solar movement was always recognised as an important subject in the study of ancient science, but it was rarely associated in any profitable way with the widespread solar elements in ancient myth and cult, except perhaps in Egypt, where the solar element in myth and religion is difficult to ignore. However, the interconnectedness of these two traditions—mythic and ‘rational’—with respect to the sun and solar phenomena was never truly discarded: Copernicus’ in the long run successful reintroduction of the sun in the centre of universe was, in a way, its final offshoot.¹⁶

It is well out of scope—and contrary to its fundamental postulates—of this study to attempt to define myth in general; but I will try to bring into sharper focus those pertinent characteristics of some narratives usually labelled myths and their relation with—specifically—geography and astronomy that will allow a coherent interpretation of a group of mythic motifs and myths in terms of the subject matter shared by the two cognitive approaches conveniently labelled ‘mythic’ and ‘rational’. At the same time, I am not privileging the group of myths that in some way treat the solar movement as representing ‘real’ myths, as opposed to others that do not fall under this provisional definition, nor do I find them paradigmatic for myths in general; in this way I believe I have succeeded to circumvent the circularity often met in discussions on myth.¹⁷ In this sense, it will be argued that the term ‘mythic’, with reference to traditional accounts of solar movement in general and solstices in particular discussed in the main part of the book, could be considered as designating a discourse that treated identical referents with the discourse styled ‘scientific’, with the main difference (for the purpose of this study) between the two in the use of their characteristic ways or idioms in describing and explaining them.

1.1. Selective interpretation of myth

In comparison to the ‘standard’ comprehensive theories of myth, a more selective interpretation applicable to a

group of particular traditional accounts, those referencing solar phenomena, is offered here. This approach is in this respect similar to Dowden’s, whose initiatory theory explains, as he himself is happy to recognise, only one class of Greek myths.¹⁸ Similarly, Fowler interprets a group of myths (Cephalus and Procris, Cephalus and Eos, Philonis, Ixion, Golden Fleece) in terms of weather and seasonal rituals, in the first place rain magic, without applying this interpretative approach on the entire corpus of Greek myth.¹⁹ With respect to ancient precedents to this approach, all ancient hermeneutic traditions selectively focused on those particular myths that were relevant, or seemed to be relevant, to their particular interpretative strategy.²⁰

The interpretative approach advanced here proposes to explain another class: narratives referencing either diurnal or annual solar movement, as well as certain related phenomena. The myths involved either explicitly include references to solar movement or their recognition does not require strained interpretations. This is a simple and I believe noncontroversial general principle that does not involve many theoretical and methodological subtleties, even though the recognition of references to solar movement in some cases will require a more detailed explanation. At the same time, the principle is rigorous up to a point that allows a profitable—or any type of—discussion on the subject, with the alternative being the perpetuation of ignoring this type of testimonies. It will be shown that the corpus of narratives built upon solar movement is very modest, but that there is a large body of myths that incorporate motifs drawn directly from the observation and/or interpretation of solar movement. However, the modest number of narratives actually built upon solar movement, to paraphrase Parker, is not what matters, but their very existence needs to be accounted for, and this will be attempted here.²¹ Both these categories of material testify to the importance of the observation and interpretation of solar movement in various mythic traditions, in the first place Greek, while the interest of myth-makers in these phenomena also speaks something of the nature of the respective mythic traditions as an appropriate medium for discussing this type of phenomena. Finally, I will not discuss in any detail the unambiguous and noncontroversial ‘standard’ account of the diurnal solar movement in Greek tradition, which is accounted for by the well-known model of chariot-ride, including its best known iteration in the Phaethon myth, except where it has some repercussions on other less-known pieces of

¹⁸ Dowden 2011b: 494.

¹⁹ Fowler 1993: 33–34, 36–40; 2013: 184–85, 461–62. Parker (2011: 25–26) distinguishes between different classes of myths dealing specifically with gods.

²⁰ Hawes 2014: 35, cf. 6, 11, 13, 24, 79–80, 89–91, 114–16, 194, 201, 205, 212, 225. In a somewhat similar fashion Plato offered an astronomical explanation of some myths (*Polit.* 268e–274e, *Tim.* 22a–23c), although elsewhere he discarded the physical explanation of myth in general (*Phaedr.* 229c–230a).

²¹ Parker 2011: 79 (cf. Konaris 2016: 271) argued that it is not the modest scope of the worship of natural phenomena in Greek cults practice that matters, but that its very existence should be explained.

¹⁶ Cf. Yates 1964: 153–55; Kahn 2001: 161; Gee 2013: 180–83. The importance and centrality of the sun—if in a different way—was already heavily emphasized in scholastic cosmology (Grant 1994: 226–27, 231–33, 235, 311, 452–54).

¹⁷ Csapo 2005: 2; Hawes 2014: 73.

evidence. In-depth discussions of this familiar model are readily available in a number of studies focusing on early Greek astronomy or myth.²² Yet this mythic model must always be borne in mind as a paradigmatic example of the Greek practice of accounting for solar phenomena in anthropomorphic terms.²³

The selective approaches conform to the dominant scholarly paradigm on the subject, which strongly discards the notion of monolithic theories of myth.²⁴ In general, one could argue for the move from dominantly dogmatic to dominantly sceptic approaches to myth as a characteristic of modern—i.e., late 20th and early 21st-c.—studies of myth. Somewhat surprisingly, this process resulted in a creation of a ‘hermeneutic environment’ analogous to the one characteristic of the approach of Greeks themselves to their myths.²⁵ This position entails, even if its proponents do not always state it explicitly, the acceptance and implementation of different interpretative strategies in myth analysis.

1.2. Ethnographic context

This polyparadigmaticism is consonant with the emphasis on myth’s dependence upon and relation to its cultural setting, entailed in the recognition of the so-called ethnographic context, which is a rather commonsensical concept that offers more possibilities for understanding and interpreting myths than many of the ‘monolithic’ theories. In its turn, the concept of ethnographic context nicely illustrates the complementarity—although not an identity—of myth and scientific accounts. This interpretative tool will be used, often implicitly, throughout this study, giving support to a concurrent treatment of narrative and descriptive accounts of phenomena of physical reality.

Ethnographic context was already evoked by Lévi-Strauss, even though he used it sparingly in his work. He

insisted that myths should be interpreted by reference ‘to the ethnography of the societies in which they originate’, analysing their different aspects, such as technology, economy, political and familial structures, systems of representation, aesthetic expression, ritual, religion, etc.²⁶ The concept was further elaborated by Detienne, who introduced the notion of a specifically Greek ethnographic context, which is composed of both ‘economic, technical or religious facts’ and also ‘different branches of knowledge—botany, medicine, the study of religious festivals’ etc.²⁷ It is thus extremely heterogeneous, and must be studied by an analysis of various complementary sources—including both myths and scientific writings.²⁸ It is possible to recognize these notions characteristic for Detienne’s method in the studies of other adherents of the Paris School (Vernant, Vidal-Naquet, etc.), who in their discussions of Greek myth focus on the ethnographic context of ancient Greece, consisting of a wide range of cultural phenomena.²⁹ Mythic narratives are thus studied in their cultural context that encompasses different branches of knowledge, including the ones that would later be called respectively mythic and scientific.

The notion of ethnographic context is, however, often left implicit in modern classical scholarship. Specifically with respect to the subject of this book, the interrelation of various intellectual and other cultural phenomena is implicitly acknowledged, without recourse to the concept of ethnographic context, when ancient literary tradition is accepted as a relevant source for the study of ancient geography. This remains the case even though the perception of geographical space of the authors working in this tradition is recognised as more subjective in comparison with a more ‘scientific’ outlook of some ancient geographers, such as Eratosthenes.³⁰ Certainly, myths—together with poetry in which they often appear—are acknowledged as an important source in the study of ancient geography,³¹ while, in its turn, ancient geographical tradition shows a remarkably ‘literary’ (i.e., descriptive and narrative) character.³² A consideration of both corpora (if one wishes to retain the traditional division between them)

²² E. g. Dicks 1970: 31–34; Gantz 1993: 30–34.

²³ As opposed to Eos’ chariot (*Od.* 23.243–46), Helios’ chariot only appears in a post-Homeric tradition (Gantz 1993: 30). For its earliest appearances (7th–6th c.) see Hes. fr. 311 M-W (Gantz 1993: 31, 33 is undecided on which part—if any—of Hyginus’ report came from the Hesiodic author); [Hes.] fr. 390 M-W *ap. Σ A. R.* 3.309–13b (p. 229 Wendel) (Malkin 1998: 188–89 believes that this fragment could actually be Hesiodic); Mimner. fr. 12.1–3, 9–11 West; *hDem.* 88–89 (late 7th–early 6th c., Faulkner 2011: 10); *Titanomachia* fr. 7 West (late 7th to late 6th c., West 2002: 109, 129–30); *hHer.* 68–69 (second half of the 6th c., Vergados 2013: 130, 145–47). Earliest iconographical attestations: *LIMC* V.1.1008, 1015 s.v. *Helios* 1 (670–660 BC: Thera neck-amphora), *Helios* 2, 95, 97 (510–500 BC: Attic lekythoi), *Helios* 101 (late 6th c.: Attic lekythos).

²⁴ Kirk 1970; 1972a: 76; 1972b: 84; 1984[1973]: 54–55, 58–61; 1974 (cf. des Bouvrie 2002: 22); Honko 1984[1972]: 46–47; Rogerson 1974: 174; Burkert 1985: 9; Wyatt 2005[1987]: 28–29; Versnel 1988: 121 = 1994: 89; 1990a: 27, 66 = 1994: 19, 86–87; 1990b: 29; 1994: 7, 11, 13; Edmunds 1990: 17; Dowden 1992: 16, 24–25; Davidson 1993: 151, 160; Patton & Doniger 1996: 2–3, 21; Lightfoot 1999: 231; Von Hendy 2001: 251, 277; Csapo 2005: 7–8, cf. 290–91; Bremmer 2011: 539 (conditionally); Parker 2011: 22, 25; Dignas & Audley-Miller 2018: viii; Iles Johnston 2018: 6–7.

²⁵ Hawes 2014: 10–13, 24–25, 35, 93, 103–15, 120, 152 (citation from p. 25); on Plutarch in this context see Hardie 1992: 4760.

²⁶ Lévi-Strauss 1976: 65; cf. Segal 1980b: 32–33; Champagne 1992.

²⁷ Detienne 1994: 130; for ethnographic context cf. 1981: 98–99, 106, 108; 1994: 143; 1999: 140 = 2009: 36–37.

²⁸ Detienne 1994: 131, cf. 1981: 107. For Detienne’s method cf. Champagne 1992 (esp. chapter 6); Calame 2011: 512–13.

²⁹ Champagne 1992 (who refers to the exponents of this approach as ‘contextualists’ or the ‘contextualist school’); Von Hendy 2001: 271–72. For the notion of (neo-structuralist) ‘school’ cf. Buxton 1981: x; Versnel 1990a: 27 with n. 7 on pp. 68–69 = 1994: 18 with n. 7; 1990b: 28–29; Champagne 1992.

³⁰ Meyer 2001: 225–27, cf. Lightfoot 2014: 8.

³¹ See Dueck 2012: 20, 24, 27, 51 for the importance of myths in the study of ancient geography and pp. 20–35 for geography in poetry and myth. For geography in poetry see also Nicolet 1991: 8, Skinner 2012: 121–22, 124, Lightfoot 2014: 8–9, Dan 2017: 172, 189–91 and Kaplan 2018: 196–201 and for fiction in general Clarke 1999: 23–25 and Roller 2018: 325–26. For astronomy in poetry, including ‘philosophical’, see Kidd 1997: 12–13 and Van Noorden 2015: 173 with n. 30; for cosmology, see Hardie 1986: 5–11, 22.

³² Van Paassen 1957: 56–57 (on Eudoxus’ geographical work) and *passim*; Romm 1992: 3–5, 7; Clarke 1999: 23–25; Meyer 2001: 225–27; Lightfoot 2014: 8. For ‘descriptive geography’ see in general Dueck 2012: 20–67, cf. Poiss 2014: 70.

seems as a prudent methodological approach to the study of a concept that appears, if with a different emphasis and from a different point of view, both in myths and in non-mythic texts.

1.3. Inclusive definitions of science

Several modern definitions of science are sufficiently broad to encompass traditional disciplines that are excluded if the criteria for delineation of modern science are applied. On the other hand, the definitions reached by judging ancient science by the standards of modern seem too restrictive and are useful for distinguishing ‘modern science’ in antiquity, but not ‘science in antiquity’.³³ They exclude much of material that—according to a recent nuanced classification of ancient geographical knowledge—belongs to the parts of the discipline that can be styled intuitive/naïve and scholarly/canonical, encompassing only the scientific/fully reasoned category,³⁴ or that—according to a similar classification of ancient astronomical knowledge—belongs to the parts of the discipline that can be styled metaphysical and cosmological or speculative astronomy, encompassing only the mathematical astronomy, itself developing from the scientific or descriptive astronomy.³⁵

These nuanced classifications offer some useful distinctions which suggest that not everything deserving of the name geography or astronomy should be judged by the criteria of mathematical, or even descriptive, science. At the same time, the place of myth—specifically those myths that refer to solar movement in some way—in these classifications is not specified. Instinctively, it would probably be placed in the ‘lowest’ respective categories, those farthest from the mathematical part of the disciplines. The inclusion of this type of myths in a discussion of ancient geography or astronomy seems justified since empirical observations were in different ways involved in the creation of mythic accounts referencing solar phenomena, while anthropomorphic causality and narrative accounts of phenomena were certainly helpful in their understanding, thus satisfying at least the minimal criteria for inclusion under the terms ‘geography’ and ‘astronomy’, however qualified.

Another favourable view of the scientific nature of early astronomy finds in it a number of traits of modern science: ‘systematic and selective observation, and the collection, coding, and eventually the visual storage of data; the analysis of stored data for regularities and cohesive structure; and the formulation of predictions on the basis of these regularities’.³⁶ The materialisation of these

procedures can be recognised in Neolithic, Chalcolithic and Bronze Age ‘megalithic observatories’, interpreted as symbolic analog models of time and space used for marking, measuring, predicting and verifying periodical events, including the annual solar movement.³⁷ What is missing in this discussion is a clear understanding that any ‘theory’ (a term used by Donald) that stood behind these models must have been expressed in terms of anthropomorphic causality, i.e., myth. Another interpretation of early buildings, this time solstitial orientations of various Egyptian temples dedicated to the solar deity, as analog devices, explicitly recognizes that the Egyptian knowledge of astronomy was expressed in stories involving gods, i.e., in mythic discourse.³⁸

These inclusive definitions of science allow the comparison of mythic cosmologies with later attempts at studying similar phenomena. Specifically, the acknowledgement of myths—narrative accounts of phenomena in terms of anthropomorphic agents—as speculative explanations based upon, in equal measure, intuitive ideas and empirical observations is of special importance in terms of my discussion in general.³⁹ One could thus attempt to assess traditional prehistoric observations and interpretations of solstices (as an important concept in the context of solar movement), dating perhaps as early as the Upper Palaeolithic period,⁴⁰ by using a set of epistemological and methodological criteria for defining science, such as empiricism, that is, information obtained from direct observation of phenomena as foundation of all knowledge, theory as a result of the study of these phenomena, and prediction of phenomena on the basis of theory.⁴¹ With respect to Donald’s example (‘observatories’), the observation of solar movement can be recognised in the orientations of certain structures towards the rising and setting points of the sun at solstices. These orientations could have been implemented in the layout of these architectural features only by the application of the data gathered through the observations of the annual solar movement. But the observations were interpreted in terms of regularities—the recognition of the cyclic nature of the annual solar movement—resulting in the manifest ability to predict the sun’s return to its extreme rising and setting points, without which the orientations would be pointless. In addition, the recognition of regularities in the sun’s behaviour must have been verbalised, i.e., described and explained, in terms of anthropomorphic causality in the form of stories. One such description and speculative explanation of the annual solar movement based upon

³³ E.g., Neugebauer 1945: 7; Clagett 1955/1957: 4, cf. Lloyd 1970: 1; Graham 2013: 256. For a criticism of such approach see Bowen 2018: 293–94.

³⁴ Dan, Geus & Guckelsberger 2014: 19–21, 26–31.

³⁵ Couprie 2011: xxviii–xxxii. For a similarly sensitive and inclusive approach to ancient ethnographic knowledge, although with no attempt at classification, see Skinner 2012, *passim* (but especially pp. 7–8, 14–17, 43–44, 49–50, 59, 133, 233–36, 241–43, 255).

³⁶ Donald 1991: 339.

³⁷ Donald 1991: 335, 337–39, cf. 340.

³⁸ Lettvin 1980: 134–35. Lettvin’s inferences with respect to the orientations of Egyptian temples are indeed supported by later studies (Shaltout & Belmonte 2005; 2006; Shaltout, Belmonte & Fekri 2007; 2008; Belmonte, Fekri, Abdel-Hadi, Shaltout & González García 2010). For the Egyptian use of metaphors rather than technical vocabulary in describing celestial phenomena and for the overlap in astronomical and religious use of certain terms see Ross 2020: 191 with n. 3.

³⁹ Cf. Popper 1982: iii.165; Gattei 2009: 33, 102 n. 4.

⁴⁰ Ruggles 2005: 318, 386; Hayden & Villeneuve 2011: 332, 347, 350–51.

⁴¹ Donald 1991: 339; Rochberg 2004: xv.

intuitive ideas—but also empirical observations—is the story of Apollo’s seasonal voyage, which can be interpreted as a narrative model that represents a specific aspect of physical reality in the context of early Greek society (chapter 7). Similar narrative models can be recognised in Homer’s account of the land of Laestrygonians (chapter 2) and the island of Syriê (chapter 5), while some resonances of this approach can be found in Pytheas’ much later account of the island of Thule, even though the latter is certainly based on solid scientific theory and a corpus of observational data.

This takes us back to the notion of ethnographic context, which seems an appropriate tool for approaching evidence belonging to different categories of texts without prejudicing the intentions of their authors solely on account of their literary classification (i.e., an epic or lyric poem, a mythic or mythographic narrative, an astronomical handbook, a periplus or periegesis, etc.). Therefore, a reference to solar movement in a dominantly literary work—such as a retelling of a myth—should be treated as an expression of familiarity with the concept, even though there is a good chance that this expression would be more idiosyncratic (or idiosyncratic in another way) than an account of solar movement in a manifestly descriptive and explanatory treatise.

1.4. Myth and physical phenomena

The appropriation of the results of the observation of solar movement by the myths discussed in this book, in the first place by the limited number of myths built upon solar movement, and their idiosyncratic treatment of these pieces of information can be explained by two fundamental characteristics of myth in general: its narrative structure—myth being a ‘syntagmatic chain of “motifemes”’—and its referencing of phenomena of common reality.⁴² The first of these characteristics explains the emphatic anthropomorphisation of these phenomena, which include seasonal processes and cosmology,⁴³ while the second acknowledges myth’s descriptive and explanatory function.⁴⁴ It is pertinent for my subject that Burkert’s definition applies to such phenomena as solar movement in general and solstices in particular, which might have been treated in story-form, perhaps only descriptively, but possibly with an attempt at causal explanation in an appropriate idiom. This approach to myth is indeed another comprehensive explanation, but on a more basic

level, which only tangentially touches upon the contents of myth. It rather focuses on its form and gives it the widest possible referent, conditioned only by the latter’s social importance (admittedly, the category of social importance is here defined in somewhat circular terms). Burkert’s definition of myth can thus be understood as an umbrella-term able to encompass different hermeneutical approaches to particular classes of motifs, episodes, stories and clusters of narratives.

In this context, a number of scholars adhere to the view that myth can describe and, perhaps, account for physical phenomena in its specific idiom characterised by anthropomorphisation and narrativisation (without claiming that it is its sole or even dominant purpose), and this view will also be supported by the present study. Earlier scholars who believed that myth accounts for physical phenomena in anthropomorphic terms usually did so in the form of comprehensive theories that were easily falsified by providing examples of myths blatantly inexplicable in these terms. This line of interpretation can be traced from the Sophist and Presocratics to the modern period and it was more vulnerable the more all-embracing it professed to be.⁴⁵ But—as I already noticed—the application of an iteration of this hermeneutical method, one formulated upon a firm set of arguments, to a circumscribed group of narratives selected by rigorous criteria, will prove successful in interpreting a number of instances otherwise insufficiently explained and at the same time it will provide theoretical support for these instances when its pertinence was ‘instinctively’ recognised.

1.5. Myth and ancient science

Some nuanced iterations of this hermeneutical method already appeared in the studies that pay more attention to details and contexts, and some of these more recent interpretative strategies will be employed and further developed in this study, especially those that problematize the relation of myth to science. In general, the most important postulate of the currently standard view on this relation seems to be that any unverified projection of modern classifications onto ancient material is anachronistic and that modern criteria should not be applied to ancient systems of thought.⁴⁶ Ancient traditions employed their own idioms in approaching physical reality, with anthropomorphisation and narrativisation being the most important characteristics

⁴² Burkert 1988: 11. For the elaboration of this definition see Bremmer 1988; it is discussed by Von Hendy 2001: 269, 277 and Calame 2009a: 1, 152. For the definition of myth as ‘applied narrative’ see further Burkert 1979a: 23 (with Iles Johnston 2018: 1–2); 1979b: 29; 1982 (cited in Calame 2003: 4). Elsewhere, Burkert (1979a: 57, cf. des Bouvrie 2002: 23, 30; 1985: 120) refers to myth’s ‘suspended reference’, or to its function ‘to illuminate reality’.

⁴³ Burkert 1979a: 23. For Burkert’s notion of phenomena of collective importance see further des Bouvrie 2002: 24.

⁴⁴ For myth as an explanatory mechanism see Popper 1980[1959]/2005: 127; Kirk 1972b: 87–88; Celoria 1992: 24, cf. 31; Brisson 1998: 7, 9; Naddaf 1998: xlii n. 25, cf. 2005: 2, 4, 37–38; Calame 1996b: 23 (further cited in des Bouvrie 2002: 15–16, 25, 47); 1999: 140.

⁴⁵ An example is the intellectualistic theory of religion, for which see Ross 1971: 105, 115; Ackerman 1975: 117–19, 124, 134; Segal 1980a: 173–74; 1980b: 4–6, 19, 26, 43; 1999: 7, 12–13, 16–18, 20–21, 39, 41, 69, 80–81, 84, 136–37, 143, 147, 149; 2004: 14–17, 19, 24, 30–31, 63, 67; Guthrie 1993: 21, 26. The proponents of the so-called myth-ritual theory upheld similar beliefs (Ackerman 1975: 124; Segal 1980a: 173–75; 1980b: 38–40, 43; 1999: 3, 41, 80, 134; 2004: 24, 27, 67).

⁴⁶ Blumenberg 1985: 12, 48 (cf. Segal 1999: 149–50); Finkelberg 1986: 322–23, 325, 327–28, 332–35; Allen 1988: ix, cf. 1988: 56; Lloyd 1990: 7, cf. 1989: 176; Kingsley 1995: 80–81, 87, 90; Calame 1996a: 22, 46 = 2003: 9–10, 27–28 (cf. Buxton 1999: 10); 1999: 121; Morgan 2000: 44–45; Betegh 2004: 178–79, 221, 284; Rochberg 2004: xii, xv; 2010: xxi.

of traditional idioms. But anthropomorphic causality was programmatically excluded from serious consideration by the Greek philosophers' creation of the explicit categories of metaphor and myth, on one side, and the concept of 'naturalness' of phenomena on the other.⁴⁷ More generally, the conflicting categories such as *logos*, 'rational', 'philosophical', 'scientific' and 'literary' on one hand, and 'myth' (*muthos*), 'fictitious', 'magic' and 'metaphorical' on the other, were introduced and utilised in polemical texts precisely in order to differentiate the novel from the traditional 'style of inquiry'.⁴⁸

This creation of categories and their hierarchical arrangement by an apparently objective criterion of assessment of their truth-value or explanatory potential is similar to the phenomenon of successive paradigm shifts, or changes in interpretative frameworks, in science. Indeed, the entire so-called *muthos-logos* transition can be understood precisely as a paradigm shift, rather than a substantial transformation of intellectual activities.⁴⁹ This also applies to dichotomies contrasting science, rationality, etc. with myth, superstition and other similar notions, in human intellectual activities in general.⁵⁰ The intellectual transformation that occurred in Greece should rather be contextualised in its political, social and historical environment, in the first place the creation of polis and adjacent phenomena, such as public debate.⁵¹

The understanding of the so-called *muthos-logos* transition as a paradigm shift is supported by and at the same time explains the existence of shared subject matter between these two approaches. The continuities between mythic and philosophical interests in similar phenomena are particularly evident in scientific theories aimed at accounting for natural phenomena and in philosophical cosmologies,⁵² with the result in 'science [becoming]...

an alternative... to some myths, or some aspects of some myths... it is scientific cosmogony, and scientific astronomy, and scientific meteorology... that are the successors, or at least the rivals, of mythical "cosmology", "astronomy", and "meteorology"'.⁵³ The paradigm-shift model emphasizes the shared subject matter but at the same time also highlights the diachronic nature of the process. However, in order to explain the juxtaposition or even intertwining of these two approaches, a rather long period of transition in which this mixing was possible must be envisaged. This is actually quite unprofitable and uninformative, since this period would, in Greek case, encompass the entire antiquity. It is more in accordance with the available evidence to note the appearance of a paradigm shift, but also to recognize the parallel existence of a previously dominant mythic paradigm with the now dominant philosophical-scientific one within the same ethnographic context. At the same time, the latter should not be understood as a monolithic construct, but rather as a continuum stretching from the fairly inclusive to extremely critical approaches, as noted above.

1.6. Anthropomorphisation and narrativisation

The presence of anthropomorphic deities is among the most typical features of myth. To a modern reader (including many scholars), this characteristic seems utterly opposed to scientific method. The deities' human form, however, appears to be not an end in itself, but could represent a base for accounting for physical phenomena in terms of human behaviour, such as in the case of Greek Helios or Mesopotamian deities in omen text, in which celestial phenomena were described and explained in terms of behaviour of anthropomorphic gods.⁵⁴ Another example, hitherto hardly acknowledged, is recognised in the concept of 'Hyperborean' Apollo as articulated in myth and cult, which, it will be argued, represents an analogous account in anthropomorphic terms referring to a phenomenon—in this case the annual movement of the sun with an emphasis on solstices—in terms of gods, that is, in mythic terms.⁵⁵ This method is not as arbitrary and unprofitable as it might seem at first. Anthropomorphism in both religion and science is an almost universal explanatory method, a strategy of hypothesising about the surrounding world and attempting a plausible interpretation of it.⁵⁶ It has its place in scientific interpretations of nature when understood as a model-building on the basis of metaphor and analogy. It is, moreover, 'uniquely intelligible' and accounts for a large number of phenomena with avoiding multiplication of hypotheses.⁵⁷ In effect, the traditional method of

⁴⁷ Detienne 1986: 102; Lloyd 1989: 210; 1991: 418, 422, 431–32.

⁴⁸ Lloyd 1990: 10, 15, cf. 46, 105; 1989: 209–11. See in more detail Hack 1939: 152; Jaeger 1946: i.43; 1947: ii.9–10, 211; Lloyd 1966: 404–405; 1989: 101–102, 172, 209–12; 1990: 7–8, 10, 23, 34, 45–46, 67, 97; 2003: 101–103, cf. 108; Detienne 1986: 107–109 (discussing Cassirer's notions); Mansfeld 1990[1986]: 43, 52–53; Lincoln 1996: 11; 1999: x, 18 (= 1997: 363), 43, 155–56 (= 2002: 225–26); Morgan 2000: 2–4, 7, 10, 17, 23, 24, 29–31, 34, 40, 45, 46, 53, 84; Struck 2004: 23–24, 50, 64, 67–70, 155, 170.

⁴⁹ Cf. Popper 1980⁴[1959]/2005: 126–28; Segal 2004: 33–34. For criticism of the *muthos-to-logos* model see Segal 1980b: 3, 44 n. 11; Vernant 1982: 103–104; 1983: 371–72, 400; Blumenberg 1985: 27; Buxton 1999: 1; Lincoln 1999: 3 = 1997: 341, 209, cf. 1996: 2; Morgan 2000: 33; Clay 2007: 210; Calame 2009a: 3; 2011: 521; Pirenne-Delforge 2009: 39; Fowler 2011: 46, 48–49; Hawes 2014: 18.

⁵⁰ Hack 1939: 38–39 (cf. Segal 1980b: 44 n. 11); Kirk 1974: 286, cf. 1984[1973]: 58–59; Lloyd 1975: 199–200 = 1991: 146; Rochberg 2010: 408.

⁵¹ See especially Vlastos 1947: 173, 175; 1953: 361–63; 1955: 75–76; Lloyd 1972: 385, 394 = 1991: 131, 139; 1989: 78–81; 1990: 8, 96–97, 105, 124–25, 141; 1991: 124–25; Vernant 1982: 10–11, 51, 39, 51–52, 59, 81, 107–108, 122, 124–32; 1983: 215–16, 237, 249, 380–81, 387–90, 396–97, 404; 1990: 92–93, 96, 99 (cf. von Reden 1999: 65; Hahn 2001: 19, 21–26, 28–35, 53; Seaford 2004: 176, 182–88, 201–202, 207); Zhmud 2012: 254–255 (citing Zaicev).

⁵² Cornford 1912: ix, 6, 11, 19, 42–43, 61; Durkheim 1995[1912]: 431; Nilsson 1949: 186; Onians 1951: 248 n. 3; Morrison 1955: 62; Kahn 1960: 158; Lloyd 1966: 50, 193, 195, 199–200, 208; 1967: 32; 1970: 9; Vernant 1990: 255; Naddaf 2005: 2, 7–8, 64.

⁵³ Mansfeld 1990[1985]: 13–14.

⁵⁴ Havelock 1963: 168–71, cf. 180; 1966a: 47–50, 54; 1978: 50; Rochberg 2004: 175. In chapter 13 and Appendix 1 it will be shown how the diurnal and annual solar movement were conceptualised and described in Mesopotamia in terms of an anthropomorphic deity. For Greek myths accounting for both the annual and diurnal solar movement in terms of an anthropomorphic deity see chs. 5–7.

⁵⁵ See chapter 7.

⁵⁶ Guthrie 1993: 3–4, 31–32, 36, 38, 62–64, 82–83, 89–90, 102–103, 176, 197 (cf. Segal 2004: 33).

⁵⁷ Guthrie 1993: 189.

accounting for causality by personalistic forces represents only an idiomatic difference with respect to the scientific rendering of causality in terms of impersonal forces.⁵⁸ This conclusion respects the differences between the two intellectual approaches to reality, but at the same time treats them as less essential than usually thought.

The very fact that solar movement was accounted for in terms of anthropomorphic causality conditioned that myth's syntagmatic structure was configured by a typical action pattern extracted from human experience.⁵⁹ In general, the gods' actions were readily modelled on human behavioural patterns, as clearly seen in the Apollo myth with its voyages, chariot driving (cf. Helios), feasts etc., relating the phenomena of objective reality accounted for by myth to the social world of humans.

The account of a natural phenomenon was thus given in the form of a narrative, another fundamental characteristic of myth that seems incongruent with scientific method.⁶⁰ The use of stories to describe and account for natural phenomena could be explained on a general level as a consequence of the linear nature of language, which prescribes linear narrative as a dominant form for the description and explanation of physical reality.⁶¹ Myth—a syntagmatic chain of actions and events—is in its turn characterised by the logic of *emplotment*, i.e., creating a 'story' out of 'dry' data.⁶² Yet the information gathered by the observation of the diurnal or annual solar movement had to be processed in some way before it could be used in stories that described and explained these events and processes in nature. It is precisely at this point that anthropomorphism, as an all-round cognitive strategy, made the data intelligible and suitable for further processing. However, it is almost impossible to outline a clear boundary between anthropomorphisation and narrativisation, and it seems that the latter was a close companion of the former from the very start of the process of making sense of the observational data in traditional societies.⁶³

⁵⁸ Horton 1967a: 50, 55, 64–66, 69–70; 1967b: 164; 1968: 632–33 (cf. Ross 1971: 111; Guthrie 1993: 35, 188; Segal 2004: 31).

⁵⁹ Frazer 1913: 88; Boas 1921: 230–31, 234–35; 1938: 614–17, 619, 622–24; Havelock 1963: 187; Lloyd 1966: 192–93, 207–209; Meletinsky 2000[1976]: 59; Burkert 1979a: 57 (cf. des Bouvrie 2002: 23, 30); 1985: 120; Blumenberg 1985: 273 (cf. Von Hendy 2001: 323, 326).

⁶⁰ Havelock 1963: 166–67, 170–71, 173–74, 180, 218, 234, 236, cf. 42–43, 85 n. 18; 1966a: 48–50, 63; 1978: 42–43, 50, 92, 106, 114–15, 122, 183, 220–21, 332; 1983: 13, 21, 24 (cf. Adkins 1983: 208–10, with criticism on pp. 210–11; Detienne 1992: 11; Halverson 1992: 150–51; Naddaf 1998: xv); Marshack 1972: 133, 197, 279, 283, 316, 330. For criticism of Havelock's theses, none of which affects the rendering of phenomena in story-form, see Halverson 1992.

⁶¹ Burkert 1979a: 23.

⁶² Calame 1999: 140–41. For a narrative representation of a particular geographical space in genealogical myth see Calame 2009a: 120–22. Thalmann 2011: 24 similarly argues that Apollonius' *Argonautica* is a narrative representation of space encompassing the Greco-Roman *oikoumenê*. See also Hawes 2017: 6 and Clarke 2017: 16, 21 for similar interactions of myth and geography (cf. Thalmann 2011: 40).

⁶³ An alternative explanation asserts that the presence of anthropomorphic (divine) causality in myth is a consequence of its being basically a story (a sequential or syntagmatic narrative, a causally connected series of diachronical events), communicating an event or process unfolding in

1.7. Observational data in myths

It transpires that observational data can be present in myths in two basic forms. But while the recognition of the presence of technical information, including the data on both diurnal and annual solar movement, in mythic accounts is hardly controversial, acknowledging the possibility of rendering such information in terms of anthropomorphic causality by way of stories seems more contentious. At the same time, it could be easily supported in Greek context by the existence of an undoubtedly anthropomorphic deity such as Helios (I will also argue in chapter 7 that the same applies to some myths and cultic realities involving Apollo), and this example alone necessitates a plausible explanation for the existence of an anthropomorphised celestial body and the fact that solar phenomena were accounted for in terms of his behaviour in Greek ethnographic context. The explanation of this phenomenon is offered by the recognition of anthropomorphism as an accessible cognitive strategy in dealing with natural phenomena. Even though the anthropomorphisation of solar phenomena in Greek myths is readily recognised by modern scholars, it is often left unexplained and glossed over hastily. My study aims to rectify this unfortunate practice by offering a firm hermeneutical framework for evaluating such mythic renderings of natural phenomena.

If some myths are renderings of observational data, this entails that this information was indeed deemed important enough for a society to preserve and transmit, but stories were built around or upon them because of the profitable explanatory potential of anthropomorphism, which was in its turn elaborated in sequential narrative. Otherwise—and more often—the results of solar observations were simply incorporated in myths or stories as information worth communicating to posterity, without actual narratives being built upon them.

A coherent and intelligible cognitive strategy thus emerges from these considerations, based upon anthropomorphic causality and narrativisation and manifesting itself in mythic renderings of natural phenomena, i.e., events, processes, sequences, and periodicities in nature. This strategy is different from the 'analytic' or 'logico-scientific' approach, characteristic of science, but this differentiation, as already noted, is not as definitive as it appears, i.e., it does not exclude the former from the involvement with natural phenomena.⁶⁴ Both approaches could operate in a single ethnographic context simultaneously, either juxtaposed to or intertwined with each other, as concrete examples of both Mesopotamia and Greece plainly show.

time, which requires that it is expressed in terms of anthropomorphised characters (Marshack 1972: 119, 132–33, 283). This hypothesis connects anthropomorphism and narrativisation in a causal relation, although it seems to be putting the cart before the horse. The reasons for provisionally favouring the former as primary are its explanatory potential and the fact it is a necessary condition for the creation of a narrative.

⁶⁴ Havelock 1963: 298, cf. 1966b: 68–69; Bruner 1986: 11–14, 42–43, 51–52, 88; Donald 1991: 256–58, 273; Wyatt 2005[2001]: 160–61, 166, 174, 184 n. 48; Rochberg 2004: 40.

This model accounting for the appearance of some myths allows the interpretation of the class of myths referencing either diurnal or annual solar movement and related phenomena in terms of their attempt at describing and explaining these processes, whether they only incorporated motifs drawn from the observation and/or interpretation of solar movement or were actually structured analogously to the phenomena themselves. It is not necessary to unconditionally accept this reconstruction of myth-creation as a general principle in order to acknowledge its applicability to the motifs, narratives and groups of stories referencing solar movement that will be studied in this essay. Indeed, it is obvious that this interpretative strategy cannot explain large portions of the vast body of narratives we customarily classify as myths. But in the case that neither this narrower application is accepted, one must still find a method of explaining the unequivocal presence of the results of solar observation in some myths, which is adequately and economically accounted for by this model; I am not aware of the existence of such an explanation. The—surely unsatisfactory—alternative is to continue ignoring them or treat them as ‘primitive’ nature-worship.

1.8. Mythic models

The recognition of the appropriation of the results of solar observation in myth, as already noted, does not entail its correspondence to science in all or even many aspects of their respective approaches to reality. But one especially profitable parallel was implicitly utilised in the preceding discussion: that of model and model-building. Indeed, model-building in terms of anthropomorphic causality rendered in story-form seems to be the best definition of the category of narratives studied in this book, i.e., those, however modest in number, specifically built on an analogy with solar movement (those myths that simply incorporate a reference to solar movement in their narrative can be explained in terms of any other hermeneutical method, but still display an awareness of and interest in the results of solar observations). Students of nature, ancient and modern, regularly engage in model-building to represent specific aspects of the surrounding world, in this way describing and explaining empirical phenomena on the base of analogy,⁶⁵ and this practice became commonplace in Presocratic, especially Milesian, cosmogonies and cosmologies, in particular with reference to ‘meteorological’ phenomena.⁶⁶ These models do not have to fully correspond to a physical reality in every aspect, but certain models may represent more aspects of the real world or fit some of them more accurately.⁶⁷ Mythic discourse also encompasses explanatory models representing

specific aspects of physical reality comparable to scientific models and having a similar cognitive function.⁶⁸ Parallel to scientific models, myth can not only reflect reality, but also ‘refract’ it by selectively emphasising certain aspects of the phenomenon it treats and by simplifying it to a level considered most productive for its purposes.⁶⁹ Its notorious fictionality should not be taken as a serious hindrance for its use in constructing models, since philosophy of science now decidedly recognises the use of fiction in scientific model-building as well as the epistemological value of such models.⁷⁰ However, in light of the unacceptability of monolithic theories of myth an all-encompassing notion of mythic models cannot be accepted, and it seems imprudent to insist on an almost complete correspondence between mythic and scientific models. At the same time, it could be granted that some myths were intended to account for natural phenomena in this way, namely those that have as their referents phenomena and processes that will later be studied by the disciplines of meteorology (in early Greek terms), astronomy and geography. The term mythic model is thus an acceptable and profitable designation for narrative accounts of physical phenomena expressed in terms of anthropomorphic causality, and I will consequently use it throughout the book when referring to mythic accounts of solar phenomena.

As already noted, typical action patterns extracted from human experience are the basic analogues in models built upon anthropomorphic causality, but all models, mythic or otherwise, are naturally based on analogies and metaphors.⁷¹ Indeed, the cognitive processes behind metaphor, analogy and model on one side and scientific (theoretical) model-building and theory on the other are all based on the premise of explaining something in our experience in terms of something else, and any assertion of identity is in some measure metaphoric, emphasising the similarities and minimising the differences, with the explicit category of metaphor designating a specific interval it bridges.⁷² In response to new experiences, humans in general use comparisons with some previously known facts, but while traditional societies use explanatory analogies derived from social contexts, resulting in a personalistic causality, modern societies use those derived

⁶⁵ Sambursky 1960: 14; Black 1962: 229–31, 233; Hesse 1966, *passim*; Barbour 1976: 6, 30, 32–33, 37–38; Giere 1999: 94; Bailer-Jones 2002: 108, 124.

⁶⁶ Sambursky 1960: 40, cf. v, 134, 242; Guthrie 1965: ii.299–300; Lloyd 1966: 232–71, 319, 321–22, 324–25, 336, 417; Furley 1987: 21–22; Guthrie 1993: 55, 153–54; Algra 1999: 49; Naddaf 2005: 73.

⁶⁷ Sambursky 1960: 14; Black 1962: 39, 41–42, 44–46, 220–21, 238; Ross 1971: 111; Barbour 1976: 6; Giere 1999: 92–93; Roby 2014: 158, 161, 167, 173–74, 177.

⁶⁸ Horton 1962: 212–13, 216–18; 1964: 97–99 (cf. Ross 1971: 111, with criticism on pp. 111–15); Ramsey 1964 (cited in Barbour 1976: 60); Barbour 1976: 6–7, 16, 27, 49, 51, 68–69; Meletinsky 2000[1976]: 155; Donald 1991: 213–15, 259, 267. For mythic models accounting for cosmogony in Hesiod’s *Theogony* see Lloyd 1966: 205; Kirk 1974: 296297; Most 1999: 344.

⁶⁹ Horton 1964: 100–101 (cf. Ross 1971: 111, with criticism on pp. 111–12); Buxton 1992: 7; 1994: 87–88, cf. Bremmer 2008[2003]: 60.

⁷⁰ Roby 2014: 157–58, 173–74, 177–78.

⁷¹ Black 1962: 236–39; Hesse 1966, *passim* (cf. Barbour 1976: 43 and Bailer-Jones 2002: 109, 113, 117, 119); Barbour 1976: 43; Bailer-Jones 2002: 114, 117–19, 124; Mourelatos 2008: 38. For the virtual identity of analogy and model see Black 1962: 232; Hesse 1966, *passim*; Lloyd 1966: 319, 321–22, 324–25, 336, 417; Barnes 1982: 40; Pender 2003: 64, 72 with n. 44; Roby 2014: 160. In general, the opinion that denies any role to figurative discourse in scientific treatment of natural phenomena is now superseded (Hesse 1988: 3; Bailer-Jones 2002: 115; Rochberg 2004: 177).

⁷² Black 1962: 229–31, 233, 238; Guthrie 1993: 47, 98, citing Oatley 1978; Lakoff & Johnson 2003[1980], *passim*.

from the world of inanimate things.⁷³ Once again, this is an important difference, but one that implies the shared subject matter of these two cognitive and hermeneutic strategies.

1.9. Conclusion

Precisely what novelties in the analysis of literary testimonies are offered by this study of a specific category of narratives—those referencing in some way solar movement—within the larger corpus of what is usually styled myth? In the first place, the focus on a rather circumscribed subject matter—and a highly specific one—allows some measure of (self-)control in applying the hermeneutic approach that allows myth to encompass (but not be reduced to) narrative models of phenomena in physical reality, characterised by anthropomorphic causality, to a category of texts studied here. Secondly, this approach offers a theoretical background for both the introduction of narrative accounts in the study of how the ancients understood natural phenomena and for the interpretation of certain motifs used in ancient narratives or the narratives themselves in terms of natural phenomena as their referents. These non-scientific texts can thus be acknowledged as accounts of natural phenomena in terms of anthropomorphic causality. In this way, a strong substantiation is provided for recent analyses—in principle, rather than in details—that either study certain large-scale mythic texts as descriptions of cosmological voyages⁷⁴ or interpret them in terms of mythic geography or cosmography.⁷⁵ This interpretation makes the application of analytical methods which would, following different assumptions, be reserved only for the analyses of scientific texts (natural phenomena unquestionably being their proper subject-matter), methodologically justifiable in the interpretation of such literary works, or the appropriate sections of these works. This on the other hand means that a complete ethnographic context of an idea, i.e., all its iterations, should be studied in order to obtain a comprehensive picture that a certain tradition entertained of some subject, such as diurnal or annual solar movement or solstices. The context must be studied by an analysis of various complementary sources, both mythic and non-mythic. In implementing this approach, I am following a well-trodden path, but in addition I have attempted to substantiate and elaborate it in this introductory chapter, with a special focus on the main subject of this book, i.e., solar phenomena.

Alongside focusing on the study of the category of texts referencing the ‘meteorological’ concepts of diurnal and

annual solar movement as they appear in Greek tradition, I will also offer a conspectus of analogous ideas in several traditions in contact with Greek civilisation. The latter was manifestly in a multi-faceted contact with Mesopotamian tradition,⁷⁶ perhaps also—less clearly—Egyptian.⁷⁷ It appears that Greek, Mesopotamian and (with some reservations) Egyptian traditions accounted for the solar movement in general and solstices in particular in a corresponding fashion (using anthropomorphic causality as a primary tool) and incorporated these phenomena similarly into their respective mythic discourses. Indeed, the Egyptian evidence from the New Kingdom onwards (perhaps even earlier) approached the Greek and Mesopotamian manner in describing and accounting for solar movement, even though an unequivocal evidence of the Egyptian understanding of solstices, as opposed to the solar movement in general, is lacking.

A similar incorporation of solar phenomena into mythic discourse cannot be argued for prehistoric traditions, since they left us no literary testimonies. However, as noted above, it is a well-established fact that the solstices were recognised in some prehistoric traditions.⁷⁸ The knowledge of this concept must have been incorporated into their respective cosmological systems and one could speculate that it was accounted for in some way, most probably in local mythic idioms. Material evidence suggests that these strategies could not have been very different from their Greek or Mesopotamian counterparts, although the example of Egypt recommends more restrained conclusions on the question of similarities between various systems.

All these traditions observed the annual solar movement and recognised the solstices, incorporating this knowledge into their respective worldviews. When they undertook to describe, communicate and account for these phenomena, they did so in the form of stories with anthropomorphic agents. This practice was used until new impersonal models of accounting for phenomena were introduced, but even then, the traditional idiom was used simultaneously with the new one—in the case of the Greco-Roman civilisation for almost the entire duration of antiquity. But even in modern science anthropomorphism, metaphor, analogy

⁷³ Boas 1921: 203–204; Abrams 1953: 31–32 (cf. Black 1962: 240); Lloyd 1966: 175, 179, 209, 304–305, 356–57, 359, 380, 415; Horton 1964: 98–99; 1967a: 64–66, 69; 1968: 632–33 (cf. Ross 1971: 111; Guthrie 1993: 34, 71; Segal 2004: 31–32).

⁷⁴ For example, Marinatos 2001, cf. Käppel 2001: 16, 19, 21 Abb. 1 and Beaulieu 2016: 53 for the *Odyssey*; Endsjo 1997: 374–75, 377, 380, Stephens 2003: 18, 178, 217–37, Noegel 2004: 129–30, 132, 135–36 and Beaulieu 2016: 84–85 for the *Argonautica*.

⁷⁵ Nakassis 2004.

⁷⁶ For the influence from Mesopotamian ideas (sometimes mediated by the Levantine or Anatolian civilisations) on Greece see Burkert 1988; 1992; 2004; West 1995: 212–17; 1997; 2014: 31–32, 97, 126; 2018; Penglase 1994; S. Morris 1997; Wyatt 2005: 102–24, 189–237; Bremmer 2008; Rutherford 2009; 2018; Loudon 2011; López-Ruiz 2010; 2014; Haubold 2013 (a different focus); Bachvarova 2016; Currie 2016: 160–222; Scurlock 2018; Rochberg 2020.

⁷⁷ For a review of Egyptian influence on Greek cosmological notions see West 1971: 36, 47, 62, 92; Naddaf 2005: 80, 82, 100–101, 107, 191 n. 24.

⁷⁸ Apart from the Upper Palaeolithic observations of solstices noted above, one could also emphasize the examples of early 5th-millennium BC Goseck (Bertemes, Schlosser 2004: 50–51; Bertemes 2008: 41) and Ippesheim enclosures (Schier 2008: 52–54), various British and Irish prehistoric sites, such as Stonehenge, Durrington Walls, Newgrange, Maes Howe, Brainport Bay, Drombeg and Dorset Cursus (Ruggles 1999: 12–13, 17, 19, 29–32, 35, 37–38, 40–41, 100, 127, 129, 136–39, 240 n. 93; 2005: 48–49, 125, 135, 237, 405–409; Pearson *et al.* 2007: 630, 633), as well as Maltese temples, such as that at Mnajdra (Hoskin 2001: 30–31).

and model-building continue to be important tools—if not nearly as decisive and dominant as before—for accessing physical reality.

Thus, humans have used the traditional narrative idiom based on anthropomorphic causality in order to account for the diurnal and annual solar movement from the Upper Palaeolithic until fairly recently. Their accounts deserve an unbiased study, relieved of the burden this particular subject matter carries on account of the 19th-c. (and some 20th-c.) interpretative strategies that focused their extravagant, excessive and now outdated theories precisely upon this body of material. This inquiry is an attempt to reintroduce the study of solar movement in myth-interpretation, i.e., to transfer it from the margin of a polyparadigmatic field it now occupies somewhat nearer to its centre, without reintroducing the untenable principles of the solar-myth school. Two distinct, yet interrelated, corpora of references to solar movement will be studied concurrently: the motifs drawn directly from the observation and/or interpretation of solar movement incorporated in mythic narratives and stories structured as anthropomorphic analogues to the phenomena themselves. The criteria for inclusion in this particular class of myths are straightforward: the stories should either explicitly include a reference to solar movement or the recognition of such a reference does not require strained readings. The interpretation of this class of myths represents another attempt at approaching the heterogeneous body of traditions usually classified as myths selectively, in line with the current polyparadigmatic hermeneutic environment.