

## HOW NATURAL IS A UNIFIED NOTION OF TIME? TEMPORAL EXPERIENCE IN EARLY GREEK THOUGHT

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### **1. Introduction**

Whatever our metaphysics of time, today we usually work with the assumption that we have one unified temporal framework which allows for situating all events, processes, and happenings. What do I mean by this? Let us say that today there may be a battle in Syria, you are reading a philosophy paper, the Dalai Lama may be engaged in some meditation, and in the Austrian Alps the first avalanche of the season may come down – these things have nothing to do with each other, they are very different things, some of them are physical things, some mental, some occurrences in nature, others in the human world, and yet we would note down all these occurrences in the very same calendar; we could, for example, say of each event that it happened on Wednesday the 6<sup>th</sup> of January 2017 (if that is when they happen). For us, all these things happen in the same time, we have a common framework for them all so that no matter which occurrences or processes we talk about, they can be put in a temporal relation to each other; they are either before, after, or simultaneous with each other.

For the early Greeks, by contrast, the very idea of such a unified notion of time would be foreign; instead they assume different temporal (and not necessarily comparable) structures belonging to different events. Not only do we not find a unified calendar throughout the ancient Greek world; more importantly, we also do not find a unified notion or idea of time before Plato. In this paper I want to show that such a unified framework is lacking in the very beginning of Western thinking and what effect this lack has on the quality of temporal experiences – it means that different temporal experiences are thus seen as experiences of genuinely different kinds.

With the exception of Anaximander and Empedocles, the philosophers before Plato hardly ever discuss temporal notions. For this reason and in order to make sure that we capture the earliest expressions of temporal notions, I will mainly discuss temporal ideas in non-philosophical authors before Plato. But these texts will not be looked at for merely historic reasons; rather they shall be shown to articulate an understanding of temporal structures that

questions many of our modern temporal conceptions. A look at ancient notions of time suggests that our notion of time as unified is not something we gain directly from experience, but rather that such a unified conception is an interpretative or theoretical overlay.

## 2. Lack of unification

Today we distinguish different aspects of temporal experience,<sup>i</sup> such as duration, sequence (i.e., the temporal order of before and after), those aspects that we express in terms of different tenses (recalling the past, facing the present, and anticipating the future), and, perhaps, the passage of time.<sup>ii</sup> But all these features are seen as different aspects of one unified time (“time” in the singular). If we look at the early ancient Greeks, by contrast, what we count as different aspects seem to be different types of experiences altogether. There are different kinds of temporal notions capturing different kinds of temporal experiences that are in the beginning not connected with each other: (1) there are notions of duration; (2) notions indicating sequence; (3) notions indicating measurable time; (4) notions linking time with agency; and (5) tense.

Some of the literature on memory has pointed out the fragmented character of memory, that it contains gaps, as well as different and, in part, disjoint narratives<sup>iii</sup> – features that also could be seen as suggesting that our conception of time as unified may not be something we can take for granted. We will see, however, that the disunity for the early Greeks is of a somewhat different kind – with them we are not dealing with gaps that are due to things being forgotten, some lack of memory; rather there are several temporal aspects that are not seen as belonging to the same kind of experience; furthermore, these disunities cannot simply be brought into a linear succession, as John Campbell thinks is ultimately possible for all autobiographical memory.<sup>iv</sup>

Let us have a closer look at the different kinds of temporal notions in early Greek thinking; due to constraints of space, I will only be able to give a very rough sketch and to point to a few examples for each notion.<sup>v</sup>

(1) “*Chronos*” is the most important notion of duration; scholars often understand it as *the* equivalent to our term “time” in such a way that other temporal notions could be subsumed under it. However, this is in fact only the case from Plato onwards. In the very beginning of Greek thinking, *chronos* indicates solely a particular time span – it is either qualified as a long or short time, or simply by itself understood as a long time. But *chronos* originally does

not indicate a time that is measured with the help of any units; rather we are just experiencing something as lasting for some duration or as (too) long. Let me give you two of the earliest examples, from Homer's *Iliad and Odyssey*:

In *Iliad* Book III, the old leaders of the Trojans sit upon the wall and when they see Helen coming upon the wall they say to each other:

There is no blame on Trojans and well-greaved Achaeans if for a long time (πολὸν χρόνον) they suffered hardship for such a woman; wondrously like is she to the immortal goddesses to look upon (lines 156-158).

*Chronos* qualified by the adjective “long” is also what we find in *Odyssey* book V, where we hear that when Odysseus is sailing off from Calypso, he gets into a storm, his mast breaks and he is thrown into the sea:

As for him, long time (πολὸν χρόνον) did the wave hold him in the depths, nor could he rise at once from beneath the onrush of the mighty wave, for the garments which beautiful Calypso had given him weighed him down (lines 319-321).

In both passages *chronos* is qualified as a long time; and both passages show that *chronos* is not only used to express a long duration, but, fairly typically for the early understanding of *chronos*, a particular long time, namely a negative time (the time Odysseus is under water, the time suffered in the case of the Trojans). There is a lot of waiting and wandering around in the *Iliad* and *Odyssey* and it is here especially where *chronos* comes in. This suggests that *chronos* is not simply understood as a neutral temporal framework (which embraces all events and lets us locate every process and event), but rather as expressing a specific emotional experience of duration. And *chronos* does not seem to be used to serve the interest of chronology. This does not mean that there cannot be a very sophisticated architecture of narrative time. For the *Iliad*, for example, Taplin has shown how the fourteen actually narrated days in the *Iliad* are marked by clear signs of closure and anticipation, and the role that the sequence of night, dawn, midday, etc. plays.<sup>vi</sup> But if we attempt to reconstruct the exact sequence of events of the Trojan War with the help of the *Iliad*, we famously get entangled in inconsistencies.<sup>vii</sup> There is no suggestion that *chronos* provides us with an overall framework or is an essential part of a chronology (as the different days and nights are). While we do find

relations of order in the *Iliad* and *Odyssey* – with the unfolding of the narrative as well as with the sequence of night, dawn, midday, etc. – these definite relations are not explicitly linked to the experienced duration; there are no points that can serve as markers within *chronos* in its earliest occurrences.

This usage of *chronos* in Homer also suggests that our sense of duration need not be connected with measurability<sup>viii</sup> in the sense that we can say at least roughly how long something lasted<sup>ix</sup> – a connection, which, for example, Mayo assumes as naturally given.<sup>x</sup> According to Mayo, we “cannot endure through an interval of time without measuring it” (1950, 71).<sup>xi</sup> By contrast, in Homer we find the idea that a certain duration is just experienced as too long, or even endless seeming. It is not connected with the idea of measurability by the narrator, and we have no reason to assume that Odysseus had a sense of how much time had elapsed since he got under the wave.

(2) There are basic notions indicating sequence, like “before” and “after”. These notions do not yet give us measurability, but are in some sense more basic: for it may be the case that we can tell whether one event happened before or after another event (or simultaneously, for that matter), without thus necessarily knowing how much before or after they took place or how long either X nor Y lasted; all we may be able to say is that X occurred before Y. Usually, earlier and later ordering is asymmetric, not reflexive, and transitive.<sup>xii</sup>

In early Greek thinking, notions like “before” (*proteron*) and “after” (*hysteron*) are often expressed as adjectives, but never as adjectives qualifying *chronos*.<sup>xiii</sup> Rather they seem to qualify people or things, like properties of things, so we find talk about “*andres proteroi*” (“former men”, *Iliad* XXI.405) and “*anthropoi proteroi*” (“former human beings”, *Iliad* V.637, XXIII.332 and *Theogony*, line 100). In translations the adjective “former” or “old” is usually applied to times, but for Homer and Hesiod it is literally applied to human beings.

(3) There are a couple of temporal notions that express certain temporal units bound to natural processes and thus express what we can call measurable time; for example, *hêmëra*, the day, *meis*, the month, or *eniautos*, the year. But it is only from the 5<sup>th</sup> century BCE onwards that *chronos* is seen as what is measured with the help of these temporal units. So in Sophocles’ *Oedipus at Colonus* lines 607ff. we find the idea that “*chronos* brings forth countless nights and days.” Here measurable time (expressed in terms of units of time like night and

day) is connected with long time (*chronos*) by having *chronos* bring forth nights and days – presumably as its parts, so that we can say how much *chronos* has passed. But before the tragedians, these temporal units do not seem to measure something else, time, as we would assume. For example, in Homer we find the expression “as the year rolled round, and the seasons came on” as a standard phrase expressing long time – “year” and “season” do not measure time; rather they themselves are what rolls around and comes on.

Moreover, these units are not always primarily used for exact quantitative measurement; rather they often also have a qualitative sense. Thus different days of the month can be seen as suitable or unsuitable for certain activities, for example, the twelfth day is good for weaving since then also the spider allegedly weaves its web.<sup>xiv</sup> A day is the unity that connects different experiences together<sup>xv</sup> and can also be identified with the fate experienced.<sup>xvi</sup>

(4) There are temporal notions indicating agency, like *kairos*, which means the right or a critical time. *Kairos* as the appropriate or critical time has no connection with measurable time, and it is also not connected with the duration expressed by *chronos*. Its original meaning is “due measure”, “proportion”, “what is vital”, which is then interpreted in a temporal sense to mean the critical time or opportunity to act.

*Kairos* is a notion that is of special importance in early medical writings: in the process of healing certain times are especially critical for applying a treatment and for the success of the healing process. For example, in the treatise *Regimen in acute diseases*, a part of the Hippocratic corpus, we find a discussion of *kairos* as the right time to administer gruel (one of the main medical drugs, it seems, at that time). Unseasonable (that is, going against the *kairos*) administration of gruel or unseasonable feeding or fasting is understood to lead to attacks in the body.<sup>xvii</sup> And in the treatise *On Fracture* *kairos* is the vital point of time in the healing of a fracture: it can be dangerous for the whole healing process or exactly the right time to apply some treatment.

*Kairos* is also prominently used in the context of Pindar’s odes celebrating the winners of Olympic (and other panhellenic) Games.<sup>xviii</sup> But it is not, as one might expect, the critical time the winner grasps in order to gain victory in the competition. Rather, it is a time for right action more generally: for example, in Pindar’s *Olympian Ode* II, lines 54-56, we hear that Theron, ruler of Akragas and winner of the chariot race in the Olympic Games in 476 BCE, has “wealth embellished with virtue”, which is what provides *kairos* for achievements.

Wealth combined with virtue (*arête*) is what will lead to the right time for successful agency. What is characteristic of *kairos* is also that it has to be grasped quickly; otherwise the opportunity may be lost.

As the critical time to do something now that will have important consequences for later, *kairos* intimately ties the present to the future: I act now so as to bring about a certain effect in the future, for example, the healing of a patient. My intention for my action in this critical time can be seen as essentially future directed.<sup>xix</sup>

(5) Finally, the experience we express with the help of tense is also not connected with the experience of *chronos*. While there seems to be a clear awareness of what we call the arrow of time early on, it is only with Plato that the direction of time is clearly coupled with *chronos*. And in early Greek thinking we also find the possibility entertained that for moral or metaphysical reasons the normal direction of time might be reversed. For example, in Hesiod's *Works and Days*, we find the idea that acting in accordance with the seasons is the only way for us human beings to keep temporality as well as morality under control. Only this will ensure that rivers will not run backwards and babies will not be born grey. The threat of children being born with grey hair because of moral chaos shows how temporal order is seen as closely bound up with moral order: our immoral actions will turn the normal temporal structures upside down.

Comprehending how exactly tense is understood by the ancient Greeks is complicated by three factors:

(a) What we take as the grammatical tenses of the Greek verb can be as much an indication of aspect as of tense, and especially express aspect in the moods other than the indicative. The three basic stems of the Greek verb – present, aorist, and perfect – correspond to three basic kinds of aspect – durative, punctual or completed, and resultant or stative. If we look, for example, at the verb form we classify as the past tense aorist in Greek, this verb form may simply express the punctual character of a happening, rather than the idea of a past happening.<sup>xx</sup>

(b) Furthermore, what we would call the present tense is not only understood as indicating the present moment (day, year, etc.). Rather, some philosophers relatively early on understand it also as indicating something outside of time, something like eternal truths.<sup>xxi</sup> The first hint in this direction we find in Parmenides' poem, which claims that what truly is “neither was nor

will be, since it is now, all at once”.<sup>xxii</sup> As a result past, present, and future tense are not necessarily understood as referring to temporal dimensions on the same footing, on what we since McTaggart understand as the A-series. Rather, on this understanding of the present tense, it is opposed to past and future.

We may think that this understanding of the present is only to be found with some philosophers, but in fact Parmenides’ understanding of the present as indicating eternity seems to take up Hesiod’s account of the “race of the blessed” as those who always *are* (αἰὲν ἔόντων). And the present is also treated remarkably differently than past and future when Homer and Hesiod take it as the point of view from which we look to past and future things. Today we usually talk about “past, present, and future” (or the other way round) as a linear sequence that is independent of the person experiencing it. By contrast, Homer and Hesiod usually talk about the present first, then about the future, and finally about past things: it is “things that are, shall be, and were”.<sup>xxiii</sup> True, this is a poetic formula for all things, present, future, past, and so may be seen simply as a different way of talking. But it is remarkable that the order given is not linear; rather the relation of the different dimensions is seen from the perspective of our experiences – it starts from where we are, here in the present moment, goes forward to the future things, and then backward to the past ones.<sup>xxiv</sup>

(c) Finally, words explicitly expressing “the future”, and not just “future things”, are only relatively late phenomena. In order to express the future time we do find the term “*chronos*” specified by an adjective or participle of motion (for example, by “*epherpôn*”, which means creeping up, or “*mellôn*”, meaning that one is about to do something). But we only find these expressions centuries after Homer and Hesiod. Interestingly they all seem to be found first in Pindar in the first half of the 5<sup>th</sup> century BCE, so with a poet who is actually paid for writing odes praising past victories in sportive competitions. One way in which the future is understood in Pindar is as something that is already there and has now, in the present, come to us: “Approaching from far away, the future has arrived and made me ashamed of my deep debt” (*Olympian Ode* 10, 7).<sup>xxv</sup>

The understanding of temporal structures I have sketched so far concerns *early* Greek thinking. But this thinking develops soon afterwards: first the notion of *chronos* becomes the dominant temporal notion and is connected with the idea of measurement. Furthermore, there is increasing demand from the historians for a unified temporal framework.<sup>xxvi</sup> And finally with

Plato we do indeed get what we can understand as a unified account of time.<sup>xxvii</sup> However, given the limits of space here, rather than looking at this process of unification, what I will do in the second part of this paper is spell out what the lack of a unified notion of time in early Greek thinking means for human temporal experience.

### 3. Consequences for Temporal Experience

In contrast to us, the early Greeks were much more oriented towards the motions of the sun and stars, and their time was structured much more by these motions than by clocks.<sup>xxviii</sup> There were certain kinds of clocks available, like sun-dials and water-clocks, but they did not structure the normal rhythm of the day (water-clocks, for example, were prominently used to make sure accuser and defender at trials got the same amount of speaking time). And the notion of hours became important only in the 4<sup>th</sup> century BCE.<sup>xxix</sup>

While these features do distinguish how time structures the daily rhythm of the early Greeks in contrast to our rhythm, these features are not necessarily an expression of a lack of a unified temporal framework. But what does give us a foretaste of the consequences for human experience of time, if a unified notion of time is missing, is a brief look at the lack of a unified calendar throughout the early Greek world, which has several philosophically interesting aspects: the early Greeks worked with local calendars, in which not only the beginning of the year, but also the beginning of the month differed from one city-state to the next. It was not meant to help dating events on a more than local level.<sup>xxx</sup> The Olympic Games were not used as a general dating system across the Greek world before the classical period.<sup>xxxi</sup>

Furthermore, not only were the calendars not synchronised between different poleis, also within one polis more than one dating system may be used: if we look at the Athenian calendar, which is the best attested Greek calendar we have,<sup>xxxii</sup> we see that the Athenians lived with at least two different calendars simultaneously, each used for different purposes: there was a calendar for the festivals which consisted of 12 months based on the cycle of the moon,<sup>xxxiii</sup> and a “political” calendar regulating the economic and administrative life, which consisted of 10 months and was based on the motions of the sun.<sup>xxxiv</sup> Originally these two calendars did not necessarily begin or end on the same days. And finally for agricultural planning the risings of stars were employed for fixing points in time.<sup>xxxv</sup>

Moreover, originally there seems to have been very little interest in the ordering of years. While our modern calendar allows for distinguishing each year by a serial number

from all other years, accommodating any future or past date, the Attic calendar was not originally set up for such a sequential ordering of years and did not provide an easy way to do so. In Athens, the different years were identified by the names of the magistrates in power in a given year, which allows for ordering years back in time for a couple of generations, but it did not provide a means to date forward (in the way in which we talk about, say, “in 2050”). The year for the Greeks was first and foremost marked out by the alteration of summer and winter, not by absolute serial numbers; events were dated relative to other events. (Of course, also for us, the number we give to years is not absolute but refers to the years after the birth of Christ or the Hijri of Mohammed, or some other significant event. This significant event is, however, kept as a fixed point, with respect to which all years are determined; by contrast, with the early Greeks, some events used for local dating seem to have lost their relevance soon after the dating, and so were not used any longer.)

Finally there is a lot of what we may call “manipulations” of the calendar: the duration of each month was not fixed in advance, but could vary. Furthermore, the coordination between the solar and the lunar year was initially done by inserting an additional month every now and then simply by repeating an existing month (as if we would say “between December and February we will have January twice”). While the astronomers suggested different cycles for inserting the additional months, it seems that the poleis did not adhere to a fixed pattern for these insertions.<sup>xxxvi</sup> And in general, the calendar could be subject to political or military concerns, controlled by the magistrates.<sup>xxxvii</sup> Given these possibilities for *ad hoc* manipulations, in addition to the fact that one city-state would base its calendar on the successions of its main politicians, another one on the term of office of its main priestess, etc., we should not be surprised to see, for example, that Thucydides has to put some effort into telling his readers *when* the battles he describes in his book are happening.<sup>xxxviii</sup>

But as mentioned already above, the lack of a unified calendar is an expression of a more basic lack in conceptual unity. One reason for this lack of a unified temporal framework is also one of the most important differences between early Greek conceptions of time and more modern ones: the fact that past, present, and future were not seen as being on the same footing in a linear sequence. This is not a question of existence, as we find it in contemporary presentist discussions about the question whether only the present or what is present exists<sup>xxxix</sup> or also the past and future (or what is past and future). Rather what we are facing with

these early Greeks is the lack of thinking of past, present, and future as constituting a linear order (a linear order presentists can also subscribe to).

For the early Greeks the present seems to indicate a point of view from which we look towards the past or the future. Contra presentists and growing block theorists the future also in some sense may be there already, but, in contrast to block universe theorists, the present is distinct vis-à-vis the past and the future, and in contrast to moving spotlight theorist we do not find any hint of the idea of the objective passage of the present.

Furthermore, for the early Greeks, present actions are seen as less directly prepared for by actions in the past so that I could say “I am doing X today so that I can do Y tomorrow, and Z the day after tomorrow”, since the idea that different days have different qualities in ways important for our actions and that we have to seize the right moment for an action is much more dominant. And the right moment cannot necessarily be brought about by us; rather we have to react to whatever the present moment may bring, and cannot assume that our planning in the past will prepare us for an action now or in the future. One way the coming about of the right moment can be influenced to some degree, however, is by leading a virtuous life – we saw the idea that morality can either prepare the possibility for the right time to come about (as in Pindar), or that moral chaos can lead to temporal chaos in the sense that immoral behaviour can deform normal temporal structures (as in Hesiod).

Also the conceptualisation of the future is remarkably different: the future seems not to have been viewed as a predictable extension of our present on the calendar given that we do not know in advance when exactly the current month will end nor is it easy to specify years in advance. To some degree future-directedness may be integrated with the present in the notion of *kairos*, the idea of a crucial time to act which will have important effects later on. But again this is not a future that is in any sense predictable or can be planned by us. In general there seems to have been much less planning in the way we are used to, for which a unified and convenient calendar is an important precondition (and much less conceptual possibility to do so). Rather, the most important planning is independent of the succession of years according to serial numbers: it is either agricultural planning,<sup>x1</sup> which is done in accordance with the seasons, or the planning of civic duties, which is also not tied to the progression of years, but to the repetition of the political cycle. While there certainly was some planning into the future, for example, for organizing the panhellenic games and other festivities, this form of planning could also basically work within a cyclical notion (of four years, in the case

of the Olympic Games), and would hardly needed to rely on the sequential ordering of years. In some sense the future seems to have been treated more similar to the past: for the agricultural calendar with the cyclical repetition of the seasons, the future does not seem to differ very much from the past, since if the harvest time is now in the future, it will soon be past, and then future again. This treatment of the future may also be one reason why it is never expressed as a subject until the 5<sup>th</sup> century.<sup>xli</sup>

Furthermore, the aspect of an action was sometimes more important than its exact temporal location. So at times it seems to have been more significant to express whether some process or state of affairs is finished or continuing, whether it is durative or point-like.

Finally, we saw that the different temporal notions are not related to each other – notions of succession, of duration, of measurable time, and of agency describe completely independent temporal aspects tied to different kinds of experiences (as we would, perhaps think of a business meeting and hiking on our own through the Scottish Highlands as unrelated experiences, even though we could of course still put them in the same calendar). Also in contemporary thought we sometimes use exact, discrete dating alongside inexact, analogue notions of duration or of past, present, and future. But these inexact notions nevertheless are such that in principle they could be made more precise – if we talk about a time that is too long lasting because it is wasted, we are usually able to translate this easily into “I have wasted a whole day”, or even “two wholly wasted hours”.<sup>xlii</sup> So there is no problem for us to connect the duration that is lasting too long with a measuring framework (even if the measurement may not be very precise). By contrast, the early Greeks would not necessarily embed a time that lasts too long in their calendar. Such a time may not be related to the idea of measurability and there does not seem to be an expectation that all the different temporal phenomena are compatible by being situated in a common framework.<sup>xliii</sup>

And this is exactly one point where the early Greek conceptualisation of temporal structures may be philosophically fruitful for us: even if in scientific and historic contexts a unified temporal framework is essential, in other contexts assuming less of a unified understanding of all temporal occurrences may do more justice to the way we experience the world. We are used to being able to put everything into one calendar and to structuring our experiences to some degree according to this calendar (tomorrow I will do X from 9am to 10am, so that I am then prepared for doing Y from 10am to noon, etc.). But some experiences clearly seem to have their own temporal structure, that we cannot know beforehand, and that

we thus cannot integrate into our calendar plan in the same way, as when we meet a friend, or when we develop a thought – can we really say that developing this idea will take me one hour, so I block one hour of the day for that? And if we want to console somebody in her grief or attempt to forget something – do these actions not have their own temporal structures that we cannot anticipate in advance?<sup>xliv</sup>

Of course we will be able to situate them in our calendar *afterwards*, but in the cases named there is no way to know their temporal structure (their duration, exact order, and specific markers) in advance. Here our temporal experience may be formed almost exclusively by what is done, and not by a neutral temporal framework. Accordingly, we do more justice to these occurrences if we approach them by letting them unfold their own temporal structure; and we may get into problems if we start by assuming them to be compatible with our standard scheduling – the way we use our calendars for future happenings suggests that we could know or at least estimate their temporal duration within a neutral framework.

Furthermore, we all know the phenomenon that our experience of time depends on what is done during this time (time is experienced as short if lots of things happen, but as long, if nothing is done during this time) and also on how involved we are, for example, whether we are agents of a certain event or not. The fact that our perception of temporal structures seems to depend on agency – we seem to perceive events as occurring closer in time when they are an action of ours and further apart if they are not<sup>xlv</sup> – also shows that in a non-scientific context we are not simply starting from a neutral temporal framework in which everything gets objectively measured in its temporal duration. Implicitly we are working with a much less unified understanding of time. And the early Greeks show us that such a unified and neutral account is much less natural and obvious than we may typically assume.<sup>xlvi</sup>

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<sup>i</sup> By "temporal experience" I want to understand not only our conscious (perceptual) experience of time and temporal phenomena, but also our psychological relation to time more generally.

<sup>ii</sup> See, for example, Le Poidevin 2000 and Pöppel 1978.

<sup>iii</sup> See Campbell 1997, 107.

<sup>iv</sup> Campbell 1997, 108 understands autobiographic memory as linearly structured since he sees it as based on our "conception of the self as spatiotemporally continuous".

<sup>v</sup> For a fuller discussion see my book manuscript *Ancient Notions of Time*.

<sup>vi</sup> See Taplin 1992, especially 14-26.

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<sup>vii</sup> For example, the famous Pylaimenes inconsistency: king Pylaimenes is killed in book V of the *Iliad*, but reappears to mourn the death of his son Harpalion in book XIII.

<sup>viii</sup> We know, of course, that the Greeks were besieging Troy for nine years, but it is not *chronos* that is measured in years.

<sup>ix</sup> By measure I do not simply mean that some period is taken to be too short or just right or too long (which presumably is a comparison with whatever we take the right time to be). Thus, I am not working with mere ordinal measurements where all that is preserved of the things to be measured is order but no concatenations can be taken into account, cf. Krantz et al. 2006, 2-3 and 11. Rather, I understand by measurement here that we are dealing with cases where we can also say that two days are twice as long as one day and that there may be so and so many days to a month or year.

<sup>x</sup> Mayo 1950, 71–8

<sup>xi</sup> For Mayo the “sense of duration and the faculty of measuring length of time are the same thing” (71) – an assumption which seems doubtful if we look at the understanding of temporal experiences in early Greek times.

<sup>xii</sup> Cf. also Campbell 1997, 105.

<sup>xiii</sup> We also find *hysteron* used as a temporal adverb, for example, in *Iliad* I, 27 or VII, 30.

<sup>xiv</sup> Cf., for example, Hesiod, *Works and Days*, lines 764 ff. and Onians 1954, 411-415.

<sup>xv</sup> Cf. Fränkel 1955.

<sup>xvi</sup> Onians 1954, 413f. He describes such a day as not lasting just a day but “as a phase of fortune of greater or less duration”.

<sup>xvii</sup> Cf. especially, *Regimen in acute diseases* XX, XXXV, and XLI.

<sup>xviii</sup> Cf. Theunissen 2000.

<sup>xix</sup> For a similar structure in modern debates on agency cf., for example, Andersen 2013, 472.

<sup>xx</sup> Cf. Kühner and Gerth 1898, §381.

<sup>xxi</sup> This is a function of the present we are of course used to, for example, when we say “2 plus 2 is 4”, but it is a function that is only developing in early Greek thinking.

<sup>xxii</sup> Cf. Owen 1966 for reading this as indicating eternity, and my defence of it in my *Natural Philosophy in Ancient Times*, which should also make it clear why I do not think Parmenides can be understood as a “Block Universe” theorist, as some people have claimed him to be.

<sup>xxiii</sup> Cf. *Iliad* I, 70 and, *Theogony* 38. In Hesiod’s *Theogony* 32-33 we find “things that shall be and things that were before; and they bade me sing of the race of the blessed ones who always are”. Here the present does not get the status of the point from which we look at past and future things. But again the present is not on the same footing as past and future; rather, it refers to everlastingness.

<sup>xxiv</sup> Interestingly, James 1890 in his account of the present uses a similar language: “the practically cognized present is no knife-edge, but a saddle-back, with a certain breath of its own on which we sit perched, and *from which we look in two directions into time*” (609, my italics). However, this does not prevent him from understanding time as a linear sequence (see, for example, 629).

<sup>xxv</sup> Cf. also *Nemean Ode* 4, 43, *Olympian Ode* 8, 28 and Fränkel 1955.

<sup>xxvi</sup> Cf. also Williams 2002, 154 and chapter 3.

<sup>xxvii</sup> See my book manuscript *Ancient Notions of Time*.

<sup>xxviii</sup> This orientation was of course the case in most later times and changed only relatively late in history.

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<sup>xxix</sup> Cf. Bickermann 1968, 15.

<sup>xxx</sup> While we are used to the differences between the Gregorian and other calendars, like the Jewish or Islamic one, we also have a clear mode of converting one into the other. With the ancient Greeks, by contrast, this was much more difficult, since in each local calendar a lot was done on an *ad hoc* basis.

<sup>xxxi</sup> Hippias of Elis is reported to have compiled the first victor lists around 400 BCE, see Christesen 2007, 2 and 47-48. But even from the classical period onwards, these lists seem to have been used mainly by chronographers and historians, while, according to Christesen 11, “individual communities continued to maintain their own eponym systems”.

<sup>xxxii</sup> Cf. Bickermann 1968, 34. Unfortunately, our testimony for the Athenian calendar is mainly from the 5th century onwards, so from a somewhat later time than the one I am mainly focusing on (and presumably after important reforms in the official calendar under Kleisthenes in the late 6<sup>th</sup> century).

<sup>xxxiii</sup> Even though the purpose of this calendar was mainly religious in the 5<sup>th</sup> century, it is usually called the “civil calendar” in the literature. Because some effort was made to connect it also with the solar year, it is also called a luni-solar calendar; for both points see Pritchett and Neugebauer 1947, 5.

<sup>xxxiv</sup> This second calendar is called the “prytany calendar” or “senatorial calendar”, see Pritchett and Neugebauer, 35. See Meritt 1928, 123ff. for the relationship between prytany (senatorial) and civil years.

<sup>xxxv</sup> As we find it, for example, in Hesiod’s *Works and Days*.

<sup>xxxvi</sup> See Bickermann 1968, 28-30 and 35. In Athens only the civil calendar was tempered with, while the prytany calendar seems to have been free from intercalation, see Bickermann, 37 and Meritt, 71.

<sup>xxxvii</sup> For example, Thucydides, *The Peloponnesian War*, V, 54 reports on the attempt of the Argives to manipulate the calendar in such a way as to get a few more days of fighting before the holy month would start when battles were forbidden; cf. Pritchett and Neugebauer 1947, 4-5.

<sup>xxxviii</sup> See Thucydides, beginning of book II, where he dates the beginning of the Peloponnesian war by referring to the dating system of the three most important poleis, to the priesthood at Argos, the *ephor* at Sparta, and the *archon* at Athens, as well as to the “16th month after the battle of Poteidea” and the opening of spring.

<sup>xxxix</sup> Or whether everything that is is present.

<sup>xl</sup> One of the central points of Hesiod’s *Works and Days*.

<sup>xli</sup> Developmental literature on time suggests that reasoning about the future requires abilities in addition to those about the past so that, at least in early child development, understanding of past and future are not simply on the same footing (see McCormack and Hanley 2011, especially 303 and 311). Reasoning about past events only requires retrieving a sequence from memory and then reasoning about it, while reasoning about future events in addition requires the mental construction of a novel series of events.

<sup>xlii</sup> And we may use relative dating in identifying a past event as having occurred before the fall of the Berlin Wall or as having taken place on the day of the Brexit referendum. But, again, we usually assume that we can translate this into a dating relative to the birth of Christ, etc.

<sup>xliiii</sup> Research on temporal notions in other cultures has also pointed out that our Western understanding of time is “neither natural nor intuitive but is the result of a gradual, constructive process” (so Friedman 1990, 103). Perhaps the most interesting understanding of time for us that Friedman discusses is that of the Mursi in Ethiopia, for whom our exact position in a lunar cycle is not a question of exact measurement but of social consensus (105).

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<sup>xliv</sup> Hallowell (1932, 656-657) has pointed out that when he was doing research with the Saultaux of Canada it was hard to arrange a particular time in the day to meet a person, because common reference points of time were lacking, social occasions simply start when people are ready.

<sup>xlv</sup> See Haggard et al. 2002.

<sup>xlvi</sup> I want to thank Michael Della Rocca, Stephen Halliwell, John Kennedy, and Ian Phillips for helpful comments on the paper.