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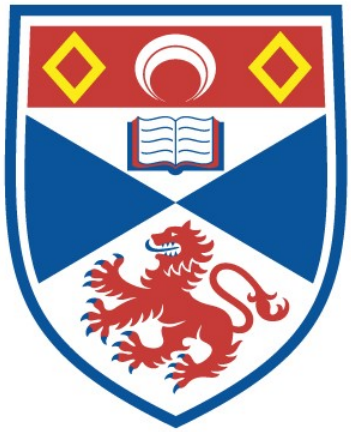
PLATO ON TIME AS A COSMIC PHENOMENON

Lorenzo Lazzarini

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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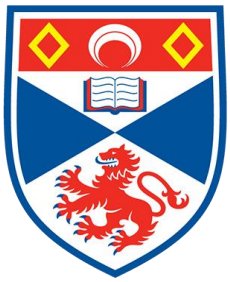

University of
St Andrews

This thesis is submitted in partial fulfilment for the degree of

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September 2019

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“Here is a place of disaffection
Time before and time after
In a dim light: neither daylight
Investing form with lucid stillness
Turning shadow into transient beauty
With slow rotation suggesting permanence
Nor darkness to purify the soul
Emptying the sensual with deprivation
Cleansing affection from the temporal”

(T. S. Eliot, *The Four Quartet*s, ‘Burnt Norton’)

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Contents

ABSTRACT:

The thesis presents an original interpretation of the account of time in the *Timaeus* (37c6-39e2), arguing that time in Plato is best conceived of as a cosmic phenomenon. In Part I, my view is contrasted in crucial respects with the consensus reading, that focuses on the metaphysical definition (time is a moving image of eternity, 37d5) and downplays the importance of the cosmos and the planets in the creation of time. I reject the standard reading of αἰών as 'eternity' and take it instead as a feature that is essential to the model *qua* living being. It follows that the creation of time – being the image of αἰών – is essential to the cosmic living being. Time, however, is best defined as a cosmic phenomenon, because it is constituted by the living motion of the cosmos and identified with the visible revolutions of the planets. In the continuation of the thesis, I examine two essential aspects of Plato's account that need further enquiry – life and structure. In Part II I focus on the semantic history of αἰών and argue that in Plato, αἰών acquires a paradigmatic function in relation to time, while still retaining the core of its traditional meaning as 'lifespan'. In fact, αἰών and time are both defined by Plato as totalities of life, although αἰών consists in an undivided unity, whereas time is structured in sequences of parts composing a whole. In Part III I focus on how the planets make the periods of the cosmic soul visible and, as a consequence, display the enumerable structure of time. That structure consists in fact in the visible patterns of changing configurations the planets display. In doing so, they mark out sequences of units, whose optimality makes time the best instantiation of number in the physical world.

INTRODUCTION

Plato's account of time presents a distinctive exegetical puzzle to readers. It challenges us to significantly reframe our conception of time, as only by doing so can *his* conception be rendered intelligible.[1] In fact, unlike other cases in which Plato's work might appear misleadingly familiar – so much so that we take our understanding of the text to be straightforward – in the case of time, the conceptual distance is immediately evident, and requires a step back. To better appreciate that distance, let us consider three aspects of Plato's account which are *prima facie* puzzling to us.

Firstly, the definition of time, generally identified as the 'moving image of eternity' (37d5), focuses on the resemblance to eternity, or, more appropriately, to αἰών. As the translation renders it, time is defined in comparison with that familiar metaphysical notion, which however does not *prima facie* make time any more intelligible. In fact, we generally define eternity in terms of time, as a timeless present, so the definition of time in terms of eternity would be patently circular. Moreover, eternity is often associated with the absolute absence of passage or motion, but, if that is the case, the universe, in Plato's conception, seems hardly capable of imitating eternity, given that in the *Timaeus* there is always motion in it. Secondly, time is said to be created by the Demiurge as part of the cosmogony (37c6-d7). In Plato's view, there could be and indeed there has been a disordered universe that is, strictly speaking, *atemporal*, despite being in motion.[2] I will return to this puzzle below.

Thirdly, throughout his account Plato maintains a substantial commitment to a cosmological conception of time. He accounts for the creation of time as being dependent on the existence of the cosmos and the planets – so much so that the planetary revolutions are eventually identified with time (39d1). We are familiar with using the position of the planets in the sky as temporal markers of days, nights, months, years and so on, and nonetheless we would resist the claim that without those revolutions there would be no time. We would resist even more firmly Plato's identity claim between the two.

In fact, unlike Plato, we think it a conceptual mistake to identify the units of time, such as months and years, with the planetary motions that mark them out. Instead, we generally conceive of time as something different from the physical objects and phenomena surrounding us. In a theoretical context we define time as the *dimension* in which physical objects and phenomena

[1] For a complete list of the instances of 'time' in the *Timaeus*, see the Index of occurrences, *s.v.* χρόνος, p. 145.

[2] My thesis presupposes a literalist reading of the *Timaeus* (as, for instance, Vlastos 1965, Mohr 1985 and Broadie 2012). For reasons that will become apparent in my analysis of Plato's account of time, to understand time as *actually* created is crucial to have an adequate grasp of its ontological status and definition (see especially Chapter 1, 2 and 4). However, while rejecting the complete picture, an anti-literalist reading might still be compatible with most of the positions I argue for in Part III.

persist and change.[3] So, we would rather classify the planets as *clocks* that measure the dimension 'time' in their revolutions.

Plato's conception of time

In this thesis, I refer on many occasions to Plato's cosmological *conception* of time. With 'conception', I simply intend to distinguish substantially different ways of accounting for the same subject matter. From the tenets introduced above we can already appreciate how distant Plato's conception of time is from ours.[4] For this reason, it is all the more important to offer the reader some preliminary clarifications about the reading of Plato's account of time that my thesis proposes. The hope is that, by bearing those clarifications in mind, the reader will find it easier to follow the various stages of my enquiry.

In my reading of Plato's account of time, time is best defined as a *cosmic phenomenon*. I have chosen 'phenomenon' because of two concomitant connotations of the term that fittingly capture Plato's conception: the contemporary use of the term and its Greek roots. In its contemporary use, which I also employed above, 'phenomenon', especially if together with 'physical', refers to the events occurring in the physical world, generally involving change and motion. In this way, time can be distinguished from physical *objects*. As we will see, while time is grounded in physical objects – the planets and the cosmos – the kinetic component is essential for defining what time is.[5]

Secondly, the derivation from φαίνεσθαι brings to the fore the visible component that is equally essential to defining time. In fact, without the fiery bodies of the planets, and the visible patterns they display, there would be no time in Plato's cosmos. Both the visible and kinetic connotation of 'phenomenon', then, already suggest to the reader the peculiar classification of time in Plato's ontology: time, in his view, is not one of the invisible dimensions in which the physical world is structured. Time rather belongs to that world, as one of its items, and as such it is in motion, and visible.

A further consequence of Plato's conception of time that is just as striking, for us, is that time is not a fundamental feature of the physical world. In fact, time is created and could be destroyed. In

[3] This is also how metaphysicians conceive of time, most famously in the dispute between three-dimensionalism and four-dimensionalism. Of course, the notion of time as a dimension has its origin in modern physics.

[4] We might even wonder if the subject matter 'time' is the same as Plato's χρόνος. I would contend that, to an extent, it is. For instance, Plato consistently treats time as something pre-eminently *enumerable* which measures events in the physical world, just as we do today. Another significant similarity, as we will see, lies in the meaning of 'time' as 'lifetime', 'age' or 'stage of life' ("he seemed old before his time"), that is central to Plato's imitative relation between time and αἰών.

[5] The kinetic nature of time, however, seems to be a persistent subject matter for debate in philosophy of time. In particular, the central question in the debate is whether time *passes* or not. The debate has its origin in McTaggart's discussion of the A, B series of time (McTaggart 1908).

Plato, just as in Aristotle, change and motion are fundamental, constituting perhaps *the* defining feature of the physical world, together with space (or more appropriately, the receptacle).[6] We would expect time and space to be on a par, but, as Cornford points out, in the *Timaeus* we find a significant disanalogy in the treatment of the two: while space is one of the three fundamental kinds, time is a rather late creation of the Demiurge's craft.[7] It is perfectly conceivable, in Plato's view, for the physical world to be *atemporal*, in its original, pre-cosmic stage, without thereby being *akinetic* or *non-spatial*.

On time and tense

The final preliminary clarification on Plato's conception of time concerns the distinction between time and tense. My claim is that in Plato's account, the creation of time does not entail the creation of tense, as tense, unlike time, belongs to the physical world fundamentally. I will therefore consider the two subject matters as distinct, so that this thesis will treat Plato's account of time while only occasionally touching upon Plato's conception of tense and tensed expressions.[8] Plato does discuss tense and the sort of distinctions that it allows to draw in terms of 'older than' and 'younger than' in a section of the account of time (37e4-38b5), and it is not my intention to deny that time and tense are closely associated. However, I maintain that their relation has been misread as one of necessary co-belonging, which the text does not warrant.[9]

Tense, in fact, is presented throughout the section as something arising from the ontological constitution of physical objects and phenomena in general, rather than as a consequence of the creation of time.[10] Given that Plato conceives of time in the non-fundamental sense sketched above, we can see that what is really required in any physical object or phenomenon, to be described in tensed terms, is *motion*. For instance, we might state that the ball was in the corner, and as it moves,

[6] The main passages showing Plato's commitment to the fundamentality of motion in the physical world – both in its ordered and disordered state – are 52d2-53b4 and 57d7-58c6. Aristotle offers an account and definition of motion in *Physics* III, 200b1-202b29 that bears no reference to time. Time, on the other hand, is treated only later, and its existence is grounded on the existence of motion and change ('no time without change', IV, 218b21-219a9). For a discussion of the ontological priority of motion, see Coope 2005, pp. 5-13.

[7] Cornford 1937, pp. 102-103.

[8] I do not follow the grammatical distinction between tense and aspect here because Plato treats any variation from the present indicative as equally a form that has come to be.

[9] A well-known example of this view has been proposed by Tarán, who runs his anti-literalist reading also on this basis (Tarán 1971, pp. 378-380).

[10] Evidence that the physical world is defined by becoming, tensed existence and older-younger relations *before* the creation of time can be found at various points in the dialogue: from the description of the uniqueness of the cosmos (ἀλλ' εἷς ὅδε μονογενὴς οὐρανὸς γεγονὼς ἔστιν καὶ ἔτ' ἔσται, 31b2-3), to the order of creation between the cosmic soul and body (Τὴν δὲ δὴ ψυχὴν οὐχ ὡς νῦν ὑστέραν ἐπιχειροῦμεν λέγειν, οὕτως ἐμηχανήσατο καὶ ὁ θεὸς νεωτέραν – οὐ γὰρ ἂν ἄρχεσθαι πρεσβύτερον ὑπὸ νεωτέρου συνέρξας εἴασεν, 34b10-c2), to the terminology used to describe the primeval chaos in the receptacle (ὅν τε καὶ χώραν καὶ γένεσιν εἶναι, τρία τριχῇ, καὶ πρὶν οὐρανὸν γενέσθαι, 52d3-4; τότε οὕτω τὰ τέτταρα γένη σειόμενα ὑπὸ τῆς δεξαμενῆς, 53a2-3; ὅτε δ' ἐπεχειρεῖτο κοσμεῖσθαι τὸ πᾶν, 53b1).

it will be on the table soon. And this is clarified by Plato, as follows: "'was' and 'will be' are properly said about the generation that passes in time, for those are two motions (κινήσεις γάρ ἐστον, 38a2)". Motion, as we have seen above, is fundamental to the physical world, even in its pre-cosmic state, which is also, in Plato's account, a pre-temporal state.

Moreover, Plato explicitly grounds tense on γένεσις, becoming, which is responsible for associating tensed distinctions to things that move in the perceivable domain (τὸ γένεσις τοῖς ἐν αἰσθήσει φερομένοις προσῆψεν, 38a5-6). On the contrary, time is never in itself the subject matter, when tense is discussed, at least until the end, at 38a7-8, when it is said that tensed expressions are associated with time. Up to that point, time is rather presented as that which contains what is responsible for tensed distinctions, i.e. becoming (περὶ τὴν ἐν χρόνῳ γένεσιν ἰοῦσαν, 38a1-2; προσήκει γίγνεσθαι διὰ χρόνου, 38a4).[11]

The point that Plato is arguing for, then, is rather that anything physical, *qua* having come to be and being in motion, is also tensed. If so, the section rather intends to apply that general claim to time, which, as a physical phenomenon, is no exception. The digression opens and closes with the claim that time has forms that have come to be (γεγονότα εἴδη, 37e4; γέγονεν εἴδη, 38a8).[12] Now, the coming into being of time is mentioned three times, both before (γενέσθαι, 37e2; γένεσιν αὐτῶν, e3) and after (γέγονεν, 38b6) the digression. The most plausible reading, then, is that time, just as the coming into being that takes place *in* time, is tensed, by having past, present and future days and nights, months, years etc.[13]

Nonetheless, time does have a preeminent connection with tensed distinctions, among physical phenomena, given its role as a unique frame of reference for everything in the physical world. Becoming is *in* time because everything that is part of the cosmos is coordinated with the sequence of past, present and future parts of time, so that tensed expressions become more

[11] Analogous considerations to the one on tense can be applied to the older-younger relation that is also mentioned in the digression, at 38a3-4 (οὔτε πρεσβύτερον οὔτε νεώτερον). The relation is predicated of things that become and seem to go hand in hand with tensed descriptions. If read in this way, there is a pre-temporal anteriority and posteriority, so the claim that the cosmic soul is anterior and older than the cosmic body (34b10-c2) is not incompatible with a posterior creation of time as in Tarán's reading (Tarán 1971, pp. 375, 379-380), once the two are conjoined to make the cosmic living being.

[12] Εἴδη can be taken as distinctive classifications of a varying appearance relative to a position, i.e. the present. Consider the parallel case in Aristotle's account of place, where he considers dimensions as "parts and forms of place", and they can either be relative to us, thus becoming so, or absolute, thus remaining always the same (Arist. *Ph.* IV 1, 208b12-19).

[13] The interpretation above might be challenged by appealing to the second part of the *Parmenides*, where the older-younger relation and tensed distinctions are ultimately grounded by time, in both the first (140e-141e) and second deduction (151e-155e). At 151e3-152a5, 'was' and 'will be' are also accounted for as participation in a time past or future. If taken as Plato's position on the matter, the *Parmenides* would clearly contradict the reading I present above. However, the claims in the *gymnasia* are incompatible with the *Timaeus* on other, more fundamental issues than time. In fact, according to Parmenides' deductions, there are no other ways for something to partake of being, except through tensed forms, which is explicitly denied in the section we are considering, where Plato argues for a tenseless way of being pertaining to the everlasting being. This seems sufficient to show that the ontology of the *gymnasia*, whatever its function in the *Parmenides*, presents us with very different ontological commitments from the *Timaeus*.

intelligible than in the pre-cosmic state.[14] As Mohr puts it, "judgements of past, present, and future may also be made by reference to a clock, in which case we may make in addition to the raw judgment of past, present and future, a judgement of just how much in the past or future something is and we may identify when the present is".[15] So, after the creation of time, tensed expressions concerning intra-cosmic objects and phenomena can be qualified in temporal terms: for instance, we specify that I start*ed* my PhD *in September 2015*, and that my PhD *will* finish *in September 2019*.[16]

Summary of the thesis

In this thesis I will develop a reading of Plato's account of time according to which time is a cosmic phenomenon, identified with the planetary revolutions and essential to the completeness of the cosmic living being. The thesis is divided into three parts, addressing different aspects of Plato's account. In Part I, I present my assessment of early ancient sources and the existing literature on Plato's account of time and argue that the crucial exegetical issue is how to connect Plato's cosmological conception and the notion of αἰών, usually translated as 'eternity' (Chapter 1). I then proceed to offer a re-reading of the central section of Plato's account – the definitional section (Chapter 2). I conclude that, in Plato's definition, time is a cosmic phenomenon imitating αἰών that is constitutive of the cosmic living being. Αἰών, in this reading, does not have the abstract meaning of eternity but is rather a paradigmatic feature of life.

In Part II, I focus on the connection between time and life, firstly by focusing on the characteristic nature of the cosmic living being, and secondly by offering an overview of the complex semantic history of αἰών. I argue that αἰών's traditional meaning as 'lifespan' shifts in natural philosophy towards a notion of 'totality of life' that does not have temporal boundaries. This latter meaning is the one we find in Plato's account of time (Chapter 3). On that basis, I argue that, in Plato's account, αἰών and time describe different sorts of totalities of life. Time, in Plato's understanding, is best thought of as the cosmic lifespan, as with its creation, the eight periods of the cosmic soul become structured as a totality. For that reason, I argue that the temporal structure is based, both in its parts and as a whole, on the cosmic periods (Chapter 4).

Finally, in Part III, I focus on the *enumerable* structure that characterises time, and on how the Demiurge creates it by means of the planetary revolutions. I argue that the planets are instruments

[14] The intelligibility introduced by time has for Plato a crucial role even in the improvement of the human condition, through the development of historical documentation exemplified by the Egyptians (Sattler 2010, pp. 256-24).
[15] Mohr 1985, p. 65. However, it should be noted that with 'clock' Mohr is really referring to time. For my criticism of Mohr, see sub-section 1.2.2.
[16] Goldin argues along the same lines that time provides means to distinguish predication of contrary states of the same object, as in 'being pale at *t*2' and 'being dark at *t*1' (Goldin 1998, p. 133).

of time, unlike the fixed stars, because of their 'wandering' motions, that collectively display the complexity of the cosmic periods (Chapter 5). Moreover, after a digression on Plato's notion of number, I argue that planetary revolutions display the enumerable structure of time in the visible patterns of phases and cycles. To conclude, I analyse the resulting enumerable structure, arguing that it stands out among the enumerable things in the physical world for its optimality (Chapter 6).

Note on translation

If not otherwise specified, I employ Zeyl's translation for the *Timaeus* (Zeyl 2000). Reeve's translation for the *Republic*, Frede's translation for the *Philebus* (in Cooper 1997), Hussey's translation for Aristotle's *Physics* III-IV (Hussey 1983), Stock's translation for *De Caelo* (in Barnes 1984) and Baltzly's translation for Proclus' commentary on the *Timaeus* (Baltzly 2009, 2013). Slight modifications of those translations, for matters of terminological consistency, sporadically occur. However, if the modification is substantial, it will be noted in a footnote.

PART I – TIME AND COSMOS

"τό τ' ἀστερωπὸν οὐρανοῦ δέμας,
Χρόνου καλὸν ποίκιλμα, τέκτονος σοφοῦ"
(*Crit.* fr. 1.33-34 Nauck – Sisyphus fragment)

Surprising as it may seem, this work does not start with an analysis of the *Timaeus*, but with some preliminary considerations on Aristotle's account of time in the *Physics.* Aristotle's discussion of his predecessors is valuable for the enquiry I am undertaking, since, as on many other topics, he is an important critic of the previous views on time. In particular, Aristotle rejects some definitions of time that convey a *cosmological* conception of time as the starting point of his own enquiry. I stressed the importance different conceptions have for the study of time. In my reading, Aristotle's rejection of a cosmological conception is the main point of departure between Plato's account and his. Because of our own unfamiliarity with the cosmological conception approaching Plato's account from Aristotle's non-cosmological point of view is a useful starting point for the enquiry, insofar as it clarifies the key differences with cosmological conceptions and prevents us from conflating the two alternatives.[17] As we will see in sub-section 1.2.2, avoiding a reduction of Plato's cosmological conception to a non-cosmological one is a crucial exegetical issue.

At the end of Part I, Plato's particular version of the cosmological conception will be further specified, with an analysis of his definition. As we will see, Plato conceives of time as a physical phenomenon, and, in particular, as a *cosmic phenomenon*. For now, however, I will characterise the cosmological conception in broader terms, as follows: time is defined by an essential relation to the cosmos, and, in particular, to its circular motion. In Section 1.1 we will see how ancient sources and Plato's text in the *Timaeus* equally support my hypothesis that Plato holds a cosmological conception. In Section 1.2 my focus will be on how modern scholars interpret Plato's account of time, and in particular, their analysis of the definitional section, at 37c6-e3. The literature takes the definition of time to be 'moving image of eternity', where 'eternity' is the contentious translation of αἰών. The crucial exegetical question, I will argue, is how to connect Plato's cosmological conception of time with that metaphysical definition. I will criticise the existing literature in two respects: (1) the widespread presupposition about the meaning and role of αἰών; (2) the solutions

[17] At various points in the thesis (in particular Section 1.1, 1.2, 3.3, 4.2 and the Conclusion), I will highlight how Plato's and Aristotle's accounts bear a degree of resemblance, while having conflicting conceptions at their foundations.

offered in the literature to connect the metaphysical definition of time with Plato's cosmological conception.

The critique of the literature will lay the foundations for articulating my exegetical position on the definitional section and, in particular, on the function played by αἰών in Plato's definition. In Chapter 2 I will first discuss the dualistic framework in the *Timaeus* and the peculiar position of Plato's account of time in the cosmogony (Sections 2.1 and 2.2). That will serve as groundwork for my reading of the definitional section, which I will offer in Sections 2.3 and 2.4.

Ch. 1: The puzzle of Plato's definition of time

The purpose of this chapter is to survey other authors' exegetical positions on Plato's definition, to introduce the reader to the main exegetical issues that I will address in Chapter 2 and beyond. There, I will present the *pars construens* of my thesis. In the present chapter I will argue that Plato's definition of time plausibly expresses a cosmological conception, *via* textual evidence corroborated by early ancient sources (Section 1.1), and discuss the issues raised by the meaning and role of αἰών (sub-section 1.2.1). The two factors are, in my reading, crucial to adjudicate whether an interpretation of Plato's account and definition of time is an adequate one. Based on those factors, I will show why previous attempts for the most part do not succeed in adequately reconstructing Plato's account (sub-section 1.2.2).

1.1. Evidence of Plato's cosmological conception

As indicated above, I take Aristotle's *Physics* to be a central source critically addressing Plato's cosmological conception of time. Hence, I will briefly comment on Aristotle's discussion of his predecessors' definitions of time:

> Some say that (1) time is the motion of the whole, others that (2) it is the sphere of the whole itself (οἱ μὲν γὰρ τὴν τοῦ ὅλου κίνησιν εἶναί φασιν, οἱ δὲ τὴν σφαῖραν αὐτήν). (1.1) Yet of the rotation of the whole even a part is a time, though it is not a rotation (the part considered is a part of a rotation, but not a rotation). (1.2) Again, if there were more than one heaven, time would equally be the motion of any one whatever of them, so that there would be many times at once. (2.1) The sphere of the whole was thought to be time, by those who said it was, because everything is both in time and in the sphere of the whole; but this assertion is too simple-minded to consider the impossibilities it contains.[18]

Aristotle presents two definitions but gives explicit arguments only against definition (1), whereas he considers definition (2) only to report the reasoning behind it, despite the fact that it entails evident absurdities. Later, at 223b13-224a2, Aristotle also accounts more extensively for the sort of reasoning that led him to propose definition (1), showing that he considers that opinion to be widely held, beyond the boundaries of natural philosophy.[19] Both definitions of time presented by Aristotle hold that a reference to the cosmos, or a certain aspect of it (motion, τοῦ ὅλου κίνησιν, the sphere, τῇ τοῦ ὅλου σφαίρᾳ) is essential in accounting for time. Both definitions, then, expresses what I described above as a *cosmological conception*. In particular, both definitions are taking the relation between time and the cosmos, or its motion, to be one of *identity*.

[18] Arist. *Ph.* IV 10, 218a33-b8.
[19] διὰ δὲ τοῦτο καὶ τὸ εἰωθὸς λέγεσθαι συμβαίνει, 223b23-24.

As they are presented as anonymous definitions, who is behind each definition can only be hypothetically retraced.[20] Although Plato is not explicitly mentioned in the section, I would argue that he is either directly or indirectly the target behind definition (1). Aristotle's students Eudemus and Theophrastus, as well as Alexander of Aphrodisias, all refer to the definition as Plato's.[21] And, even if we denied that is Plato's definition, (1) is an early testimony of a definition that is clearly Platonic in spirit, as we will see below, despite not employing the same terminology as the *Timaeus*.

Aristotle, by refuting cosmological definitions at the outset of his account, aims to develop a *non-cosmological* definition of time. The first objection (1.1) highlights the irrelevance of a full rotation of the cosmos for the existence of time, since even any part of that motion (τῆς περιφορᾶς τὸ μέρος) would be *some* time. The importance of circular motion for time, in Plato's view, will be discussed in Chapter 4 and 6, where I will bring back Aristotle's objection and view as a term of comparison.

The second objection (1.2) foregrounds what Aristotle takes to be the absurd consequences of identifying time with cosmic motion. While the same sort of motion, according to Aristotle, can have many instantiations, time is necessarily singular. Aristotle entertains the possibility of multiple *cosmoi* as a reductio of definition (1), as it would take each a rotation as identical with time, having many simultaneous *times*. Maintaining that there are multiple concomitant times is patently absurd for Aristotle, and therefore definition (1) cannot be correct. However, as we will see, in the Conclusion, this objection highlights, from our standpoint, a valuable feature of Plato's account that Aristotle's lacks.

As for Aristotle's discussion of definition (2), he argues that it is maintained because time and the geometrical shape of the cosmos are both universal containers of sorts (ὅτι ἔν τε τῷ χρόνῳ πάντα ἐστὶν καὶ ἐν τῇ τοῦ ὅλου σφαίρᾳ). While he recognises that time, unlike motion, is not localised in any intra-cosmic object, but it is everywhere and with all things alike (ὁ δὲ χρόνος ὁμοίως καὶ πανταχοῦ καὶ παρὰ πᾶσιν, 218b13), the conditions for being in time and being in the cosmos are distinct ones, despite the fact that they apply, for the most part, to the same sort of objects (see 219b15-220a9).

Beyond Aristotle's discussion, the Platonic *Definitions* also propose a definition of time that bears significant resemblance to definition (1) in Aristotle, while also introducing new aspects. Time is defined as "the motion of the Sun, the measure of its course (ἡλίου κίνησις, μέτρον φορᾶς)"[22]. As we can see, only the first part of the definition presents an identity with motion

[20] Coope 2005, p. 32.
[21] Simplicius reports to us of the consensus in his commentary on the *Physics* (*In Ph.* IX-I, p. 700, 16-20).
[22] 411b3. The day is defined immediately after time, as "the journey of the sun, from rising to setting; the light opposed to the night".

analogous to the one discussed by Aristotle, whereas the second part of the definition highlights a distinction between time and the motion of the Sun, as the measure and the measur*ed*, which suggests a weaker relation of dependence.[23] Most importantly, the motion that defines time is not that of the cosmos, but specifically the Sun's, making less clear whether the definition holds a cosmological conception of time.

Now, the account of time in the *Timaeus* provides some crucial insights on the terminology and claims of the definition above, which makes it far more similar to Aristotle's definition (1) than it may initially appear. For instance, the creation of a measure for planetary revolutions is accomplished by kindling the Sun (39b2-5), and the Sun, just as the other planets, is moving along the paths of the circles of the Same and the Different composing the cosmic soul (38c7-d4, 38e3-39a2).[24] Leaving aside for the time being the function played by the Sun and the other planets, we can see how the identification with the motion of the Sun would be close enough to an identification with the motion of the cosmos, giving further ground to a Platonic vindication of a cosmological conception of time.

Most importantly, however, Plato's account itself provides significant evidence that the definitions discussed above capture his commitment to a cosmological conception of time. There are, in fact, two respects in which Plato's account openly shows that commitment. Firstly, there are the three passages presenting a ἅμα relation between time and cosmos, or heaven (37d6, e2, 38b6-7).[25] The first ἅμα relation has a slightly different connotation, as it focuses on different aspects of the creation of time, as we will see in Section 2.4. In the other two occurrences, however, the relation puts forth a significant 'togetherness' in creation and destruction between time and the cosmos.

It is ambiguous what exactly 'together' here means. Ἅμα can express a range of different meanings, depending on the context. It could stand for 'together in time', that is 'simultaneously', rendered as 'at once', as well as 'necessarily together in existence'.[26] Hence, depending on how we

[23] The reference to the measure of motion could also be a proto-Aristotelian account, as time is also described by Aristotle as the measure of motion (ὁ χρόνος μέτρον κινήσεως καὶ τοῦ κινεῖσθαι, Cf. 220b32-221a1), and is not identified with motion itself. In Speusippus (fr. 64 IP = Plut. *Plat. Quaest.* 8, 1007a-b) and Xenocrates' definitions (fr. 79 IP = Aetius, *Plac.* 318, 13-14), the cosmological conception is not explicit anymore, perhaps showing a general tendency, as with other topics in natural philosophy, to conform to Aristotle's non-cosmological conception of time.

[24] I use 'planets' to refer to all the seven heavenly bodies involved in the creation of time, of which traditionally only five (Mercury, Venus, Mars, Jupiter and Saturn) were called 'wanderers'. For my defence of this terminological choice, see p. 94.

[25] In this whole work I will use 'cosmos' and 'heaven' interchangeably, as Plato himself suggests at 28b2-4, (κόσμος, οὐρανὸς) to refer to the single, all-comprehensive and supremely ordered living being created by the Demiurge. The term 'universe' (τὸ πᾶν), on the other hand, seems synonymous with 'physical world', i.e. the ensemble of all the corporeal and sensible nature, before and after the Demiurge's intervention.

[26] *LSJ s.v.* ἅμα. Aristotle distinguishes in the *Categories* a non-temporal meaning of ἅμα, 'by nature', as an example of which he gives the double and the half, pointing out that they are together because they necessarily coexist, and none of the two has a causal priority over the other in being (*Cat.* 13, 14b27-29). They are, we could say, two aspects of the

read the ἅμα relations, we might have a stronger or weaker claim about the relation between time and the cosmos. However, at least 'simultaneously' as in 'at a certain time' should be ruled out as a reading, since defining the creation of time in temporal terms seems circular.[27] Nor could it be an accidental concurrence, up to an arbitrary decision on the Demiurge's part. Otherwise, the insight would not be significant enough to present it *via* three connected ἅμα relations. This is especially true in the last passage, where the same ἅμα relation is said to apply also in case of (hypothetical) destruction: "they would also be dissolved *together* (ἅμα), if ever a dissolution of them should take place".

There is an array of possible explanations of the necessary co-dependence between time and the cosmos. The bottom line is that time, while being presented as distinct from the cosmos, is also dependent on its existence, and *vice versa*. Hence, their concomitant creation must be grounded in non-accidental reasons. We will see in Section 2.4 that the ἅμα relation follows from Plato's definition of time. For the time being, it is sufficient to see that those passages set the expectations for a definition of time that expresses a cosmological conception.

The second respect in which Plato's account is a proponent of a cosmological conception of time is even more significant. The claim is most clearly stated at 39d1, as an identity claim between time and the planetary revolutions. This passage refers to the motion of the five traditionally 'wandering' heavenly bodies, i.e. Mercury, Venus, Mars, Jupiter and Saturn (χρόνον ὄντα τὰς τούτων πλάνας), but it is meant as a generalisation of the identity claims already proposed between the revolutions of the Sun and the Moon and the night-and-day, the month and the year respectively (39c1-5, see Section 5.1). The eight revolutions of the seven planets, if we take Plato at face value, are identical with time, thus resembling the *Definitions*' identification of time with the revolution of the Sun. Moreover, as I pointed out above, the planetary revolutions are following the motions of the two circles of the cosmic soul, hence making the above identity claim also greatly resemble definition (1) in Aristotle (see Section 5.2). In fact, the identity between time and the revolutions of the planets entails identity with cosmic circular motion, just as definition (1) states.

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same quantitative relation. As we will see in Section 2.3, the first ἅμα relation is a case of two aspects of the same operation, whereas the second and the third express an essential coexistence, highlighting how time is an essential part of making a cosmos.

[27] Some authors take Plato to intentionally use occasional temporal references in accounting for time (Mohr 1985, p. 59, Mason 2006, pp. 180-181, Taylor 1928 p. 190). The most controversial case is the passage at 38c1-3, where some read the subject of the sentence to be 'time' despite the predication "for all time". However, despite the controversial syntaxis, taking time to be the implicit subject would lead – at best – to the uninformative consequence of temporally qualifying the existence of time as 'for all time' (see Brague 1982, p. 40, and Johns 2014, p. 7-10, for a discussion of the reading I propose). However, readings that seem uninformative and out of place with the argument developed should be taken as an indication that we, not Plato, are on the wrong track. There are, in fact, additional contextual reasons concerning the comparison that rule out the reading above, indicating that the subject is rather the cosmos (see Section 4.1).

Given our contemporary conception of time, however, taking the identity claim at face value is problematic. It is perhaps not surprising, then, that its significance has been downplayed by most modern scholars, as we will see in sub-section 1.2.2. While it is generally recognised that for Plato the creation of the planets is part of the creation of time in a loose sense, most interpreters envisage their function as that of a cosmic clock, hence showing a substantial agreement with the Aristotelian standpoint on the issue. However, we might wonder if this approach is fruitful for an understanding of Plato's account of time, where in addition to explicit claims like the ones presented above, the whole picture presented in the account does not seem to be easily adaptable to our own assumptions about the nature of time. To understate claims proposing a strong cosmological conception is even more misleading when there is early evidence, as seen above, that Platonist definitions of time do express such a conception.

There is however a second, more significant reason why Plato's cosmological conception has been downplayed. As first pointed out by Remi Brague, what is today taken to be Plato's 'official' definition of time in the *Timaeus* does not resemble in any way the cosmological definitions considered above, nor does it *prima facie* expresses a cosmological conception of time: time is defined as a moving image of eternity (εἰκὼ κινητόν τινα αἰῶνος, 37d5).[28] I will refer to this definition as the *metaphysical* definition of time. In fact, at the core of the definition lies a metaphysical imitation where the paradigmatic term, αἰών, translated as 'eternity', pertains to the ideal rather than the physical domain. Eternity is evidently central to the metaphysical definition while it is never mentioned in the external sources we looked into above, suggesting that Aristotle and the scholars that put together the *Definitions* did not consider eternity as a crucial aspect of Plato's contributions to the enquiry on time.

George S. Claghorn argues that with definition (1) Aristotle is presenting a strawman of Plato's account while not addressing the 'real' definition of time Plato proposed, i.e. the metaphysical definition. This criticism is coupled with an important exegetical claim, namely that Aristotle's definition "will be found to bear a close resemblance, if not to be identical, with that of Plato". Thus, he infers, Aristotle couldn't have criticised Plato on the crucial aspects of his metaphysical definition, agreeing with him substantially. I will refer to this exegetical position as syncretistic.[29] Although Claghorn's syncretism misses the mark in portraying both Plato's and

[28] Brague presents an extended examination of ancient doxography to show how the cosmological definition is generally recognised as one of the two definitions of time attributed to Plato, being often presented together with the moving image of αἰών (Brague 1982, pp. 13-24). As Brague points out, that consensus has a rather late origin, at least among the ancient scholars, given that it is only with Plotinus and later Neoplatonist that the metaphysical definition comes to the forefront.

[29] Claghorn 1954, pp. 88-89. Wolfgang Von Leyden proposes a more cautious attempt to compare Plato's and Aristotle's accounts of time in a syncretistic way (Von Leyden 1964, p. 52).

Aristotle's account and their substantial disagreements, it is an outstanding representative of a general tendency in the literature to downplay the cosmological claims present in Plato's account so as to prioritise the metaphysical definition.

At the other end in the spectrum of possible interpretations is the position maintaining that both the metaphysical definition and the cosmological conception of time are valid, but they refer to two different times, as argued in Proclus' commentary. Proclus maintains the 'twofold time' interpretation, that takes time to exist in two distinct ways: there is the invisible and hypercosmic time (discussed at 24 – 32), that defines its essence and is presented as the image of eternity, while, on the other hand, there is a visible and encosmic time (discussed at 53 – 57) that is constituted by the revolutions of the heavenly bodies in the cosmos.[30] Proclus' interpretation is not tenable, and no contemporary scholar holds the view, as there is no textual ground to claim that Plato had two distinct notions of time at play in his account. Nonetheless, his position certainly highlights the tension between the metaphysical definition and the cosmological conception displayed in Plato's account.

The same tension can be found in contemporary interpretations, falling between the two extremes, as we will see in the next section. That tension, it seems to me, highlights a crucial issue that I will expand in the next section, namely that Plato's commitment to a cosmological conception of time is difficult to reconcile with the accepted reading of the metaphysical definition. Reconciling the two in an adequate way is the exegetical puzzle posed by Plato's account of time. In an attempt to solve this puzzle, we will turn once more to the secondary literature, and analyse the main exegetical positions to see whether they succeed in the task, and what their shortcomings are.

1.2. A review of contemporary scholarship and its presuppositions

As anticipated, the answer given by most contemporary scholars to the question 'What is time, according to Plato?' is found in the section I will refer to as 'definitional section' (37c6-e3). Here follows Zeyl's translation, slightly modified to render it more neutral:

[30] "There has also been a twofold precession of time into existent things, the first of which is hypercosmic (ὑπερκόσμιος) while the other is encosmic (ἐγκόσμιος). While the first one both proceeds and remains simultaneously, the other is carried along in motion. The time that undergoes participation is likewise twofold. On the one hand, there is that which exists by virtue of simple participation. On the other hand, there is that in the cycles of the celestial stars which produces months, days, nights and years […]. Since the understanding is dual in form, one is understanding of time as it truly is (which *is* the number of all the cycles in everything), while the other is understanding of the time that is said to derive from the former (which proceeds *in accordance with* number)" (*In Ti.* IV, 53, 13-18; 54, 15-18).

> Now when the Father who had begotten the universe observed it set in motion and alive, a thing that had come to be as a shrine for the everlasting gods, he was well pleased, and in his delight he thought of making it more like its model still. So, as the model was itself an everlasting Living Thing, he set himself to bringing this universe to completion in such a way that it, too, would be like that (τοιοῦτον) to the extent that was possible. Now it was the Living Thing's nature to be αἰών-ly, but it isn't possible to bestow it fully upon anything that is begotten. And so he began to think of making a moving image of αἰών: at the same time as he brought order to the universe, he would make an αἰών-ly image, moving according to number, of αἰών remaining in unity. That (τοῦτον), of course, is what we now call "time".[31]

There is good reason to concede that the section is giving us Plato's official definition of time: at the end of the section Timaeus reveals that he was describing the creation of time (τοῦτον ὃν δὴ χρόνον ὠνομάκαμεν, 37d7). Naming the referent of τοῦτον 'time' makes it a definition. The question is, however, whether the moving image of eternity is the only candidate as a *definiens* in the definitional section, and, even if so, what it means.[32]

These exegetical issues, however, cannot be addressed apart from the question about the meaning of 'eternity' in the definition, as the standard translation of αἰών in Plato's account of time. On a widespread understanding, αἰών describes the ontological status of forms, which is either synonymous with or derived from their everlasting nature (τὴν ἀίδιον οὐσίαν, 37e5). Such status is often described as a 'timeless' present, absence of passage or endless duration, taken to be expressed by the established connection between αἰών and an absolute unity of existence (μένοντος αἰῶνος ἐν ἑνὶ, 37d6).[33] As I just described it, the translation of αἰών as 'eternity' seems apt. However, I will challenge that understanding and translation of αἰών in the next chapter, as it fails to adequately capture the structural and biological connotation of the term. In view of the importance played by αἰών in the account of time, I will use the Greek term from now on, to leave its meaning open until it will be further dissected in Chapter 3.

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[31] Zeyl's translation differs from translations like Cornford's and Taylor's, in that it takes the final τοῦτον as a demonstrative pronoun referring to number. This issue will be discussed in Section 2.4. Moreover, as we will see in Sub-section 1.2.1, the τοιοῦτον at 37d2 is usually translated in a non-neutral way, making explicit a certain interpretation of the passage. I render it as 'like that' in the translation to maintain the ambiguity concerning what it refers to. For my outline of Plato's account of time, see p. 137.

[32] I will address the issue of whether the above is the complete version of Plato's definition of time in Section 2.4.

[33] Here follows a variety of characterisations of αἰών as eternity: "The παράδειγμα is not a thing 'in the making' at all; passage and succession have nothing to do with it; it has its being in αἰών, eternity" (Taylor 1928, p. 187). "The concept of duration without change, as the attribute of real being was first formulated by Parmenides. Plato echoes his words about the One being: 'It never was nor ever will be, since it is now all at once' (frag. 8, 5). The 'indivisible' being of Plato's intelligible world demands a duration that 'abides (rests) in unity'" (Cornford 1937, p. 102). "Le Temps est né avec le Ciel et il a été creé sur le modéle de la substance éternelle, afin qu'il lui resemblât le plus possible selon sa capacité" (Festugière 1949, p. 267). "Plato is to be credited with the introduction of this term [αἰών] in the sense of timeless eternity, though in further defining the concept he adopts a language similar to Parmenides' description of the One as being now all at once, a single whole" (Von Leyden 1964, p. 36). "If eternality is a matter of immutability it can well be expressed also as 'abiding in unity' […]. The Forms are a sort of thing that never at any time fails to exist, and in *that* sense may be considered sempiternal; *but their possession of a kind of being utterly immune to any sort of change or destruction*, a being that cannot fail to endure without limit and with absolute stability, *is complete at every instant, and does not materialize or increase as time passes*" (Patterson 1985, p. 40).

The standard presupposition about the meaning of αἰών is the main point of substantial agreement for the array of different readings of Plato's account. I will present the exegetical issues concerning αἰών in the definitional section in Section 1.2.1 and I will discuss the main families of readings of Plato's conception of time in Section 1.2.2. My claim is that reading αἰών as 'eternity' leads to further exegetical issues and to implausible interpretations, thus making a strong case for the revision of the meaning and consequent function of αἰών in the definitional section as articulated in Chapter 2.

1.2.1. On 'eternity'

Whereas there is a substantial consensus on the presupposition concerning the meaning of αἰών, there are at least two respects in which interpretations of the definitional section diverge significantly: (a) the relation between being everlasting (αὐτὸ τυγχάνει ζῷον ἀίδιον ὄν, 37d1) and being of an αἰών-ly nature (τοῦ ζῴου φύσις ἐτύγχανεν οὖσα αἰώνιος, 37d3), both associated with the model in two consecutive sentences; (b) the relation between αἰών itself and the model and image qualified as αἰών-ly.[34] I will argue that the presupposition concerning αἰών restricts the exegetical options in both respects and generates unnecessary concerns.

The exegetical options in the literature concerning (a), i.e. the relation between 'everlasting' and 'αἰών-ly', are two: they are taken to be either synonyms, or as one entailing the other. The first option is best exemplified by the influential analysis of André-Jean Festugière, although he is by no means the only scholar who reads the text in this way.[35] The supposed meaning of αἰών is introduced by Festugière as the ever-existing status of something that has never-ending duration, which is predicated of the model as αἰών-ly.[36] Festugière explicitly reads ἀίδιος and αἰώνιος as synonyms, both contrasted with the αἰών-ly image: "d'un côté on a l'ἀίδιος οὐσία (37 e 5 = ζῷον ἀίδιον d 2 = φύσις αἰώνιος d 4) dont la durée ne comporte aucune division temporelle, qui est

[34] I translate ἀίδιος as 'everlasting' because 'eternal' is widely employed as a translation of αἰώνιος, and the two need to be distinguished. In Plato's specific use in the *Timaeus*, however, ἀίδιος is not describing anything *lasting* in a durational sense, as it rather qualifies the tenseless existence of the ideal kind as the negation of coming into being (see sub-section 2.1.2). I will use 'sempiternal', in accordance with the literature, to refer to the created and yet endless existence of the cosmos.

[35] Richard Mohr shares Festugière's reading, insofar as he refers to the section 37e4-38a8 of Plato's account of time as "Plato's elaboration of the nature of eternity of the model", despite the fact that the focus of that section is the ἀίδιος οὐσία (Mohr 1985, p. 71-75). More recently, Andrew S. Mason endorsed the reading: "The most natural reading of *aiōnios* would seem to be 'everlasting'; and this is certainly true of *aïdios* and of *aei on* or *aei kata tauta echon*. These terms are frequently applied to the Forms before 37c, and no one would suspect, in advance of this passage, that anything other than endless duration was being ascribed to them" (Mason 2006, p. 181).

[36] "Le 'toujours' désignant un 'permanent recommencé' devait dépendre d'un 'toujours' désignant un 'permanent et immobile', que ce qui change constamment de la même façon devait dépendre d'un principe, ou participer à un modèle, absolument immutable", Festugière 1971, p. 264.

un éternel présent: de l'autre on a l'αἰώνιος εἰκών dont la durée indéfinie progresse selon les parties (μέρη χρόνου 37 e 4) ou catégories du temps, passé, présent, avenir".[37]

However, this interpretation is simply stipulated, with no argument in its favour. As far as I am aware, the only reason justifying the hypothesis is found in the similar phrasing introducing 'everlasting' and 'αἰών-ly'. Both are in fact presented as qualifications of the living being used as a model for the cosmos (τυγχάνει ζῷον ἀίδιον ὄν, τοῦ ζῴου φύσις ἐτύγχανεν οὖσα αἰώνιος). If anything, the repetition of a statement that supposedly conveys the very same content should be taken as odd, especially given that, while ἀίδιος and other terms describing an everlasting existence are employed throughout the first part of the dialogue, before the account of time begins, αἰών and its adjectivization exclusively appear in the account of time.[38]

The second option is more plausible, as it acknowledges a degree of complexity in the text. It takes 'everlasting' as entailing 'αἰών-ly' while having a distinct meaning. This reading is presented by Taylor as follows: "the thought is that only that which is αἰώνιος, 'eternal' in the sense that it knows no 'passage', is never 'in the making', can strictly be called ἀίδιος, 'everlasting'".[39] Taylor's view suggests that despite being predicated of all the same beings, the two terms focus on different aspects, αἰών-ly describing a 'timeless' absence of passage, which suggests no past and no future and is defined by unity, whereas 'everlasting' highlights not being subject to generation and destruction. Hence, the view could address the worry raised above about the specificity of the role played by αἰών in the definitional section, by noting that while the αἰών-ly nature of forms has not been important up to that point in the dialogue, it is crucial for the creation of time.

While this interpretation is more tenable, it also fails to consider further exegetical options as equally (or more) plausible, as it takes for granted the presupposition concerning the meaning of αἰών without further discussion. In fact, it stipulates that αἰών-ly is a property of forms *qua* forms. However, this does not have to be the case, and, indeed does not seem to be the most intuitive reading of the two passages above, where the reference is twice to the intelligible *living* being chosen as a model. It remains an unexplored option that the αἰών-ly nature is specific to that model, as a *living* being, despite being dependent on its everlastingness. In this alternative reading, being a living being and being everlasting are *both* necessary conditions for being αἰών-ly, so that αἰών-ly is

[37] Festugière 1971, p. 269. Even in Festugière's translation, 'eternal' and 'eternity' ambiguously render ἀίδιον and αἰών, while αἰώνιος is translated as 'never-ending duration of life': 'Vivant éternel (ζῷον ἀίδιον)', 'la nature du Vivant intelligible comporte un durée de vie sans fin (τοῦ ζῴου φύσις ἐτύγχανεν οὖσα αἰώνιος)' and 'image mobile d'éternité (εἰκὼ κινητόν τινα αἰῶνος)' (ibid. p. 264).

[38] Ἀίδιος is mentioned three times (37c6, d1, e5) in the account of time, against the eight times for αἰών and its adjectivized forms (37d3, d5, d6, d7, 38a7, b8, c2, 39e2). Moreover, αἰών is never used in the rest of the speech, whereas ἀίδιος appears at 29a3 and a5 and later at 40b5, and ἀεί is associated with 'being' ten times (27d6, 28a1, a2, a7, b6, 32b3, 34a8, 35a2, 37a1, b3).

[39] Taylor 1928, p. 186.

not a synonym nor entailed by being everlasting *per se*. This unaddressed alternative is developed in my positive analysis of the definitional section, in Chapter 2.

Now we can turn to issue (b), namely the unclear relation between αἰών, the αἰών-ly nature of the model and the αἰών-ly image. A first issue is that of having one too many models. On the one hand the intelligible living being is still the model (37c8, 38c1), insofar as *its* αἰών-ly nature is the one that is imitated in the αἰών-ly image (αἰώνιον εἰκόνα, 37d7). However, αἰών itself is also presented as the object of imitation for the image in the metaphysical definition of time. Now, this issue could be solved by taking αἰών as meaning the same as the αἰών-ly nature of the model, so that there is no separate αἰών over and above the αἰών-ly nature. Indeed, that will be my reading in Section 2.4.

This reading, however, has been challenged by raising the further issue of the αἰών-ly image. In fact, if we take αἰών as 'eternity', i.e. the absence of passage typical of forms, a worry can be raised about the ways in which a physical image can also be αἰών-ly, 'eternal'.[40] As a response to this exegetical pressure, some interpreters take the adjective αἰώνιος to only describe the imitation of αἰών, despite the fact that the model is presented as having an αἰών-ly nature in the first place. This remark is usually coupled with the claim that resemblance with αἰών is accomplished in the physical domain through a sempiternal cosmos (see sub-section 1.2.2).

As with the previous issue, the vast majority of the commentators does not consider the full range of exegetical options available: once we consider that αἰών might not mean 'eternity' and might be a specific feature of *that* model, as suggested above, it turns out that the one and only form with an αἰών-ly nature is the everlasting living being. While the issue of clarifying how there can be a moving image of αἰών still remains, the hypothesis allows to dissolve the issues raised above, thereby making alternation in terminology between αἰών and αἰών-ly as not problematic: αἰών would be a feature specific to that model (therefore described as αἰών-ly) that needs correspondence in the image, i.e. the cosmos, with a moving image of αἰών. I will put forth this reading in Section 2.4, where I will also clarify in what respect the cosmos can be αἰών-ly as the model.

[40] This worry is raised already in Proclus, who takes αἰών to be ontologically prior to the αἰών-ly living being that partakes in it (*in Ti.* IV 1, 12 – 14). Similarly, Mohr takes αἰών to be a 'meta-form' similar in function to the five great kinds in the *Sophist* or the One in the *Parmenides* (Mohr 1985, pp. 70-75). Cornford even proposes to emend the αἰώνιον predicated of the image as ἀέναον, 'ever-flowing' (*Lg.* 966e), maintaining that Plato must have drawn a clear difference between the image and the αἰών-ly model (Cornford 1937, p. 98).

1.2.2. Readings of Plato's definition of time

I now turn to the interpretations of Plato's metaphysical definition of time. Although most accounts disagree on the details, their exegetical stances can be led back to four main families.[41] We will see how, in maintaining their reading of αἰών as 'eternity', most contemporary scholars fail to account for the specificity of Plato's cosmological claims. In fact, if αἰών means eternity, the creation of its image entails the imitation of a feature of forms *qua* forms, and it is not intuitively accomplished by any cosmic arrangement.[42] Hence, despite the acknowledgement of Plato's overall cosmological conception of time in the literature, most contemporary views cannot satisfactorily account for *why* such conception would follow from the metaphysical definition of time.

I will start with the view that is most influenced by the reading of αἰών as 'eternity', thereby being the most unsuccessful in reconciling the definition of time with Plato's cosmological conception. That view is followed by progressively more promising ones. As with my analysis of the exegetical issues concerning αἰών, my criticism also underscores, by way of contrast, what a promising reading of Plato's account should commit to.

(1) *Time as 'sempiternity of cosmic motion'*:

This view has been proposed first by Festugière and later developed further by Patterson and Mason.[43] The view most consistently envisages αἰών, intended as the absolute absence of passage characterising the forms, as the core of Plato's conception of time. Of course, time is deficient when compared to αἰών, insofar as it is a *moving* image of it. Time, then, as the second-best version of 'eternity', consists in the sempiternity of the cosmos. Sempiternity is defined as the stable persistence of the cosmos and its order throughout its never-ending motion, such that, even if it had generation, it won't ever be destroyed. The authors that hold this view do recognise the importance of the regularity of cosmic motion as in view (2). However, their claim is that the *regularity* of motion is only instrumental to the attainment of structural stability that grants the cosmos a sempiternal existence. The regular and circular motion, then, appears as merely a precondition for

[41] This division does not aim to assess each author's view individually. For instance, Taylor's can be taken as an instance of (1) or (2), depending on the passages chosen (see *fn.* 43). My goal is rather to recognise that the two views stand as distinct exegetical stances and to evaluate each in its own merit.

[42] These considerations will be further articulated once I set out the positive part of my thesis, in Section 2.1 and 2.3. As for my use of 'fundamental ontology' with a distinct meaning from 'metaphysical', see *fn.* 62.

[43] "His general concern is (A) to establish a strong distinction between eternity and time consonant with his basic division between Being and Becoming, where there is yet (B) a natural association between the two. The distinction he draws is in effect that between two types of stability: one a matter of absolute immutability, the other of everlasting regular mutation" (Patterson 1985, p. 42). Moreover, see Festugière 1971, p. 266, Patterson 1985, pp. 36-37 and 41-43, Mason 2006, pp. 182-185. Even Taylor, who mostly seems to hold view (2), remarks that "the sensible world is a thing of passage, but it never passes *away*; its passage fills *all* time, and of course, the formal laws of its structure remain the same throughout" (Taylor 1928, p. 187).

sempiternity. That is how they also read the following passage: "for the model is something that has being for all αἰών (πάντα αἰῶνά), while it, on the other hand, has been begotten, is, and shall be, up to the completion, for all time (διὰ τέλους τὸν ἅπαντα χρόνον)" (38c1-3). 'For all time' simply means that the cosmos is sempiternal.

Support for this reading is usually found in the section of Plato's account of tense and tenseless existence (37e3-38b5). This family of views, consistent with their reading of αἰών as eternity, takes time as a newly acquired ontological status of the physical world – sempiternity – approximating the absence of passage of 'eternity'. They generally argue that such an ontological modification is what grounds the phenomena of becoming older and younger and tensed distinctions such as 'was' and 'will be'.[44] However, as mentioned in the Introduction, tense is a matter of fundamental ontology, i.e. a fixed aspect that defines the physicality of the world as such, while time, in Plato, is a non-fundamental feature of the physical world. As Plato makes clear in the text, it is not time itself, but becoming that is responsible for the tensed distinctions, as much as older/younger relations of physical, perceivable objects (38a6). Physical objects and phenomena, then, exist in a tensed way independently from the creation of time of a moving image of αἰών, so they should not be considered as evidence for the view.

Moreover, the 'sempiternity' view can be rejected in a weaker and stronger way. In a weaker way, it can be argued that the creation of time is not the same as, nor it is essential to the attainment of sempiternity for the cosmos, since the latter is a consequence of separate demiurgic operations. Firstly, we have the Demiurge warranting the indissolubility of the cosmic body at 32c2-4. Later, we have the creation of the cosmic soul and the union of the two, which leads to "a divine beginning of intelligent and *unceasing* life (θείαν ἀρχὴν ἤρξατο ἀπαύστου καὶ ἔμφρονος βίου, 36e4)". Then, and only then, the creation of time is introduced, at 37c6, with a reference to the cosmos, already "alive and set in motion". While it is true that the unceasing life of the cosmos is further qualified as "for all time" (πρὸς τὸν σύμπαντα χρόνον, 36e4-5), which seems to anticipate the creation of time, we should not take 'unceasing' and 'for all time' as synonyms for 'without an end', as it would simply be redundant. Furthermore, while the unceasing life is grounded in the indestructibility of the cosmic soul and body, in their harmonious motion, the creation of time is introducing something additional to that life, namely the planetary revolutions. Unceasing cosmic life, then, is at best a precondition for the cosmos to live 'for all time'.

Finally, the Demiurge's speech at 41a7-d3 describes the same (precarious) sempiternity as quasi-immortality and indissolubility attained in virtue of the Demiurge's unfailing good will.

[44] Patterson, just as Mason (Patterson 1985, p. 37, Mason 2006, p. 183), appeals to the *Parmenides* for drawing this inference. However, see *fn.* 13 for why the *Parmenides* should not be compared with the *Timaeus* for matters of tense and time.

There, the sempiternal condition already bestowed to the cosmic god *before* the creation of time is extended to all created gods, without any mention that they would henceforth partake in time. The view, then, fails precisely in narrowing down what the creation of time brings to the table, as that cannot be sempiternity.

A stronger criticism to that position, however, holds that for the cosmos to be "for all time" does not even require a sempiternal existence as a precondition. As I will argue in Section 4.2, 'for all time' should not be taken as meaning 'an infinite amount of time', as it rather corresponds to the complete number of time (39d3-4), which is a *finite* totality time. If I am correct in my assessment, then, to be 'for all time' would be compatible with the event of a cosmic destruction at the end of it, that is with a non-sempiternal cosmos. The reason why a cosmic destruction does not happen is entirely independent from the creation of time as a moving image of αἰών, as it is due to the craft and good will of the Demiurge.

(2) *Time as 'regular cosmic motion'*:

Unlike (1), this view acknowledges the cosmological conception of time in Plato's account. The view is held in various forms by Alfred E. Taylor, Harold F. Cherniss, G. E. L. Owen and Gregory Vlastos, and claims that time is, in Plato's definition, identical to the regular and circular motion of the cosmos, just as in Aristotle's definition (1) in Section 1.1. As Taylor puts it: "The revolution of the eight circles *is* 'time'. There are not two separate stages in fact, though in the narrative we have first to speak of the 'making' of the 'circles' and then of the 'making' of 'time'. The two are aspects of the same process".[45] Before the arrangement of the cosmos, motion in the physical domain was disordered and didn't proceed on a circular path, hence not bearing any resemblance to αἰών. Once the cosmos is made, though, there is circular and regular motion in the physical domain, as the closest kinetic approximation to the unchanging sameness of αἰών.[46]

This view seems to be supported by the three ἅμα relations discussed in Section 1.1. In fact, the view would allow the strongest reading of the relation, since the cosmos, as a living being, is defined by its circular and regular motion. Hence, creating the cosmos entails creating its regular motion, i.e. time, and likewise for its destruction. Vlastos' position is of particular interest, insofar

[45] Taylor 1928, pp. 187-188.

[46] "The visible οὐρανός has its life in time, not in eternity, but the way in which its life is made up of unending cycles of motion is the nearest approach which 'passage' (τὸ γιγνόμενον) can make to the abiding self-sameness and quiet of eternity" (Taylor 1928, p. 221). Owen describes the motion of the planets as being flawed because they display both stability and instability, as that is the best approximation of the physical world to αἰών as eternity (Owen 1966, p. 334). According to Vlastos, what the Demiurge created in making time is simply a cosmos in which there is "uniform and measurable time-flow" because of the kind of heavenly revolutions it started (Vlastos 1965, p. 410). Cherniss takes as similar reading: "time is the rational aspect of orderliness in the phenomenal realm by which the flux of becoming can simulate the eternity of real being" (Cherniss 1977, pp. 236-37).

as it explicitly draws a contrast between Plato's and Aristotle's standpoint, arguing that "the doctrine of time in the *Timaios* is a stronger version of the cyclical time of *Phys.* 223b2-224a2. If Aristotle takes the heavenly revolutions as a necessary condition of time, the *Timaios* seems to identify them with time"[47]. In this way, Vlastos makes an important step further in understanding the relation between time and cosmic motion as the core of Plato's account (see Section 1.1). If we take the weaker reading, as a relation of *dependence*, our reading is closer to the Aristotelian viewpoint. This distinction will be important when I discuss view (3).

However, while this view recognises that the planets also play a part in the creation of time, it takes them as additional tools for making time accessible *to us*, as a cosmic clock. The view holds that there is no essential difference between the cosmic rotations per se and the planetary revolutions, insofar as the imitation of αἰών is concerned. In fact, the difference-maker is the regularity and circularity of cosmic motion.[48]

The 'regular cosmic motion' view, then, is criticisable for the same reason view (1) was. Firstly, circular and regular motion is introduced to make the universe alive and intelligent, so the goal of that operation does not seem to be the approximation to the 'eternity' of forms. Secondly, while the regularity and circularity of cosmic motion are introduced already with the crafting of the cosmic body and soul, and their unified life (34a, 36c-d), that living being is not yet αἰών-ly. In fact, time is created as a *further* step *via* the creation of the planets, which are the focus of the account for more than half of its length (38c3-39e2).[49] The view, then, does not adequately thematise the crucial function played by the planets. While the acknowledgement that cosmic circular motion is the focus of Plato's account of time is on point, that does not entail an unqualified identity between time and cosmic motion. There is an intermediate option between identity and mere dependence that is not considered by Vlastos, which allows for a *partial* identity. That relation is, as we will see, the *constitution* relation: cosmic motion becomes a moving image of αἰών only when the planets move along the circles of the cosmic soul, bringing visibility and enumerability to that motion (see Part III for an extended discussion of the point).

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[47] Vlastos 1939, p. 76. In footnote he adds that "in the *Timaios* he [Plato] is contrasting χρόνος as periodic form with the formlessness of random process" (p.76, *fn.* 2). Vlastos' assessment seems to overstate the role played by heavenly motion in Aristotle's account of time. It is clear from what Aristotle says that, in his view, there would be time even without heavenly motion. What would be lost is 'just' the best clock available (see view (3) for a brief discussion of the Aristotelian view).

[48] "If there is to be equable succession, time must be measurable. Hence for the origination of time the 'planets' are said to be made to be the world's great natural time-keepers […]. They 'divide' or 'determine' the numbers, because we use their revolutions as units for measuring time", Taylor 1928, p. 191-192.

[49] While the account of time goes from 37c6 to 39e2, the making of the cosmic body, soul and their joint circular motion is accounted for between 31b4 and 37a3. The creation of time is treated as an entirely distinct demiurgic operation.

(3) *Time as 'the cosmic clock':*

The 'cosmic clock' view is the one that most adequately acknowledges the specificity of Plato's cosmological conception of time, insofar as it recognises the setting up of the planets and their revolutions as *the* operation the creation of time consists in. Cornford is the first to gesture at the view, as follows: "time is essentially divided into the three 'forms', past, present, future; and it 'moves according to number', being measured by a plurality of recurrent 'parts', the periods called day, month, year. Nothing that we can call Time can exist without these units of measurement; and these again cannot exist without the regular revolutions of the heavenly bodies, the motions of the celestial clock".[50] The emphasis is on how the planets contribute in creating time as something *enumerable*, which did not exist before. In fact, despite being circular and regular, the rotations of the cosmos could not yet be counted as sequence of units, and enumerability is essential for time.

Richard Mohr develops the view in a thorough and compelling way. In Mohr's view, Plato's conception of time does not modify the physical world in any fundamental way, as it seems that view (1), and in certain cases view (2), suggest. His main thesis is that "when Plato says that the Demiurge makes time, he means that the Demiurge makes a clock, nothing more, nothing less".[51] As seen in the Introduction, Mohr also rejects the reading that tense is part of the creation of time.[52]

To do justice to Mohr's account, we need a brief outline of his broader epistemological and ontological claims concerning the forms and the model-image relation. Mohr puts forth the notion of 'immanent standard' as the crucial one to understand Plato's natural philosophy. Immanent standards are compared by Mohr to physical objects taken as universal standards, as the Standard Meter Stick or the Standard Pound. The peculiarity of similar objects, according to Mohr, is that they can be considered in two respects: "they will be that by which other phenomena are identified and so these other phenomena may be viewed as instances of them, and in this way they will be like Forms in serving as universals. Yet, on the other hand, immanent standards will themselves be instances of Forms; they will be perfect instances, corresponding precisely to their Form-standard, but they will be instances nonetheless".[53]

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[50] Cornford 1937, p. 102. Cornford does not offer a substantial explanation for why the planets, more than any other clock, are necessary for the creation of time. The only addition to the cosmos introduced by the planets seems to be the primary role they have in teaching mankind to count and calculate (Cornford 1937, p. 105). His reference to Aristotle's explanation of what he deems a mistaken view makes it clear that Cornford, just as Mohr, approaches Plato's account with Aristotelian spectacles on (p. 103). While I also employ Aristotle's account as a valuable term of comparison for Plato's, I maintain that two are *competing* accounts of time. Aristotle's report of cosmological views of time comes with an explanation of them in non-cosmological terms, thus making it exegetically unreliable.

[51] Mohr 1985, p. 54.

[52] *Ibid.*, pp. 64-66.

[53] Mohr 1985, p. 56. The driving motivation behind the creation of immanent standards is their function as *epistemic support*: "the immanent standards serve as the objects of true opinion in the same way that Forms (as standards) serve as the objects of knowledge. The Demiurge, by introducing immanent standards, improves the world by making it more

What is crucial, in Mohr's view, is that in making immanent standards we create an absolute term of comparison for measurement in the physical world, whereas in their absence only relative comparisons are possible. Once the relevant immanent standard is in place, we can use it to compare every other two or more items one against the other in terms of meters, pounds, and so on. Time, in Mohr's reading, should be understood as one of these standards, that is as a standard clock. For instance, Achilles is faster than the tortoise, but with the immanent standard 'time' we can determine *how much* faster.[54]

This reading is also connected with Mohr's original reading of αἰών, that separates it from the notion of an unchanging present, although he maintains it is a property of forms as such. In Mohr's view, in describing the nature of the model as being αἰών-ly, what is highlighted is the nature of forms as absolute standards. In fact, being qualified as αἰών-ly, 'eternal', just means that something does not belong to the class of objects that undergo change and is thereby measured by standards. In virtue of their αἰών-ly nature forms are taken as standards-defining instances in the world, while not being confounded with those instances. On the other hand, the cosmic clock, as an immanent standard in motion, is both a standard that measures (i.e. a moving image of αἰών) and an object that undergoes change, thereby an instance of forms.[55]

Despite its value in recognising that the planets bring temporal measurability to the cosmos, Mohr's reading also fails to provide an adequate analysis of their function, in two respects: firstly, it does not appropriately ground the claim that the planetary revolutions are a standard for measuring motion and, secondly, it does maintain two incompatible notions of time, one of which is implicitly Aristotelian.

On the first point, Mohr's account does not specify any objective requisite for distinguishing an immanent standard from the changeable material objects it measures, other than the function it plays *for us*. The cosmic clock is an immanent standard, then, simply because that is *how we use it*.[56] This position seems especially problematic given that the notion of clock Mohr is working with

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intelligible" (Mohr 1985, p. 3). Moreover, immanent standards, like the forms, have two functions: "First, they in themselves are in some sense objects of knowledge and second, they as standards or measures allow us to identify, by reference to them, the types and kinds of other things" (Mohr 1985, p. 13).

[54] Here Mohr is drawing an interesting distinction between what he calls determinate and indeterminate kinds of measurements. Even without a standard we can easily make comparisons concerning 'more' and 'less', but to have a determinate measurement, answering the 'how much' question, we need a standard with reference to which everything in a certain domain is measured. The cosmic clock has precisely this standard role in Mohr's picture.

[55] Mohr 1985, pp. 70-75.

[56] Despite broadly endorsing Mohr's reading, Goldin remarks that his account "places undue weight on the role the Forms play for *us*, as standards by which *we* account for and measure things", at the expense of the ontological basis grounding what counts as a standard (Goldin 1998, p. 133). Goldin's additionally argues that the creation of time brings further order and determinacy to the physical world, hence making it more similar to the realm of forms. Hence, although he partially embraces the 'cosmic clock' interpretation, his account seems ultimately to turn back to view (2), when he argues that the cosmic clock also affects the ontological status of the physical world (Goldin 1998, p. 133).

leaves open the possibility of instantiation of multiple clocks, so that it remains unclear what accounts for one in particular being a standard. In fact, the view leaves a choice between two unappealing alternatives, for different reasons: *either* (a) we accept that the form-like status of immanent standards is arbitrarily assigned (e.g. by human conventions and use, or by some historical reason, such as 'the Demiurge intended for these planets to be used as a standard') *or* (b) we claim that something is an immanent standard because it has certain optimal features for the goal of measurement (e.g. the most precise clock), thus defining time as the material object that best functions as a clock.

Option (a) takes the status of standard as a stipulation not grounded on features intrinsic to the object. Whereas convention is what determines the case of the Standard Meter, it cannot be applied to forms and their instances, as on Plato's account ontological constitution is crucial to separate out standards from instances. The Standard Meter is universally recognised by us to be the object after which we measure any other length, but it is not any different from other objects of the same length we might fabricate, as a standard. Arguing that in setting up the planets as a clock, the Demiurge "removes that part of the world in its aspect as a standard from being the subject of judgements of dates and duration" is, *via* option (a), just a metaphorical description. In fact, all it is claiming is that the Demiurge created the planetary revolutions to be used as the standard clock, despite there being no objective difference between the those revolutions and, for instance, a water clock in Egypt.[57]

In considering option (b), however, the concern remains that, as noted above, in Mohr's view, a standard is simply one with reference to which we measure in absolute terms. Insofar as more than one clock can or does exist (e.g. man-made ones), hence potentially playing the function of a standard, more than one time would also exist at once. In fact, if the only objective difference is how effective they are at measuring, because of precision and longevity, the change brought about by the creation of a cosmic clock would not be the introduction of something entirely new, but

[57] Mohr 1985, p. 69. In outlining his notion of 'immanent standard', Mohr seems to suggest that indeed his reading is a conventionalist one: "the only occasion on which it is natural in ordinary discourse to predicate (change) of standards with respect to their status as standards is in fact when the standards have broken and so have reverted to being just any material objects. When they are working, we do not make predictions of them; we use them to make predictions" (Mohr 1985, pp. 68-69). The Demiurge does concern himself with our epistemic access to time, as shown at 39b5-c1 and 47a1-7. However, the term employed to describe our access to number *via* the observation of the planetary revolutions is 'partaking' (μετάσχοι, 39b6). To partake in something entails that it is not exhausted by our use, as those revolutions are already part of what makes the cosmos an adequate image of the chosen model independently of human beings. The very idea of making time a particularly excellent clock for our epistemological progress presents the universe as created *for us*, which is clearly non-platonic. As stated in the *Laws* to reprimand the lazy young man that does not revere the gods, "you who have forgotten that nothing is created except to provide the entire universe with a life of bliss. You forget that creation is not for your benefit: *you* exist for the sake of the universe" (903c2-5). We know that Plato was familiar with man-made clocks, although only to measure short intervals of time. For instance, Socrates twice refers to the use of water-clocks to measure the maximum length of a speech in courts or assemblies in the *Theaetetus*: κατεπείγει γὰρ ὕδωρ ῥέον—καὶ οὐκ ἐγχωρεῖ (172e1); πρὸς ὕδωρ σμικρὸν διδάξαι, 201b2-3. For the ancient use of water-clocks in Egyptians and Babylonians to measure hours in the day and the night, and hence as a proper clock, and not just as a timer, see Hannah 2009 pp. 98-99.

simply the introduction of something better, and that is not enough to claim that time *is* the cosmic clock, any more than another clock. The excellence at being a standard is an insufficient explanation of the fact that time, in Plato's account, is identified with the cosmic clock. This makes Mohr's view at best incomplete, in that it does not adequately explain Plato's cosmological conception.

Option (b), then, would force Mohr's interpretation to claim either that there are as many *times* as there are clocks, or to collapse into an Aristotelian position, where the notion of time and clock are clearly distinct. The latter option is the one that Mohr seems to end up with. In fact, my second objection concerns how Mohr (and Cornford, for that matter) is implicitly introducing an Aristotelian reading of Plato's account of time to accommodate for the problems highlighted above. Mohr, in his own words, conceives of time, in Plato's sense, as a clock. But our familiar notion of clock is *de facto* Aristotelian, as it distinguishes between the clock and time, as the former serve to measure the latter (a clock is "an instrument for the measurement of time").[58]

Because he takes Plato's time to simply refer to a clock, Mohr is forced to introduce a second notion of time, to render the notion of clock intelligible. This is most evident when he points out that Plato is proposing a technical notion of time as "a clock by which we measure time, where 'time' here is used in a colloquial sense, as that about motion and rest which is measurable".[59] That distinction, however, exactly corresponds to the Aristotelian distinction between the motion that measures time and time itself: "time is a measure of motion and of being moved, and it measures the motion by determining a motion which will measure the whole motion, as the cubit does the length by determining an amount which will measure out the whole".[60]

As we have seen in Section 1.1, Aristotle's conception of time is a non-cosmological one, which means that time is *not* defined by its relation to cosmic motion. Hence, Aristotle's reconstruction of time-measurement is that, by (1) selecting motion A, e.g. the Sun's daily revolution, which marks out a shorter time than motion B, i.e. the one we intend to measure, and, (2) by considering the temporal intervals of equal length motion A marks out, (3) we measure motion B. In Mohr's take, both (1) and (2) are time, i.e. both that which is marked out and that which marks out. This, however, is not a plausible interpretation, given that on the one hand, Plato never lays out a twofold notion of time, but only the so-called technical notion, while, on the other, Aristotle criticises the cosmological conception precisely because it conflates (1) and (2).

Of course, there are reasons for finding it natural to read Plato's account with Aristotelian spectacles. We are clearly more sympathetic to understanding the planets as a cosmic clock, with

[58] *OED*, *s.v.* clock.
[59] Mohr 1985, p. 59.
[60] *Ph.* IV, 220b32-221a4.

Mohr and Aristotle, than to accept the cosmological conception proposed by Plato and the related puzzling theoretical commitments seen in Section 1.1. What is more, while Aristotle's account is extensive and addresses a number of issues in detail, Plato's is often elliptical in presenting his view, so seeking Aristotle's help in exegesis is understandable. Nonetheless, we must avoid the undesirable move of entrusting Aristotle's standpoint to be the judge of Plato's account and conception, precisely because we find it much more familiar. In fact, the danger of imposing alien positions and issues on the text is very high. Even if there is no 'innocent' perspective to start with, we should strive as much as possible to understand Plato's account as a well-integrated part of the cosmogony, in the terms presented at the beginning of Timaeus' speech. That is the goal of the last view I consider.

(4) *Time as a cosmic phenomenon:*

The last position, first outlined by Remi Brague, is the one I also subscribe to. Brague's main contribution is the thorough critique of the widespread presupposition concerning the role played by αἰών and the metaphysical definition in Plato's account. His critique opens new exegetical possibilities for a more adequate reading, in two ways. Firstly, Brague's critical assessment puts forth an understanding of αἰών as a term which is specifically tied to the model *qua* living being. This claim allows Brague to bring together the insights from the previous views, while avoiding their shortcomings. In fact, it renders the creation of time intelligible, as it concerns the cosmos and its living motion, as recognised by view (2). Secondly, it also captures the fact that time is created by setting up the planetary revolutions, as view (3) acknowledges, given that the moving image of αἰών is only created in the cosmos once the planets *visibly* display cosmic living motion, so as to make it enumerable.

Most importantly, however, this reading highlights how the metaphysical definition of time, i.e. the moving image of αἰών really is presenting a cosmological conception of time.[61] Time is in fact conceived as a *cosmic phenomenon* consisting in the collective motion of the planets and characterised by the display of visible patterns (i.e. nights-and-days, months, years etc.), based on the circles of the cosmic soul. In Chapter 2, I will discuss Brague's remarks in detail and highlight the disagreements between our readings. Nonetheless, this thesis wouldn't have been written without Brague's insights to begin with.

[61] "Ainsi, nous avons vu que ce sont les astres en leur mouvement régulier qui sont image. Il est d'ailleurs bien plus naturel, nous semble-t-il, de nommer image le ciel visible plutôt que le temps, inaccessible aux sens" (Brague 1982, p. 55). "Car ce à quoi le temps est ici *presque* identifié n'est pas le ciel, l'ensemble de corps célestes en leur matérialité, ni même le mouvement de ces corps, mais bien le ciel dans la mesure où celui-ci est en mouvement, et dans la mesure où ce mouvement, à son tour, *se règle sur le nombre*" (Brague 1982, p. 61).

Ch. 2: A re-reading of the definitional section

The criticism of contemporary views on Plato's account of time proposed in Section 1.2 focuses on the common presupposition concerning the meaning of αἰών as 'eternity'. That presupposition, I argued, leads the vast majority of scholars to face exegetical deadlocks in their attempt to bring together the metaphysical definition of time (i.e. the moving image of αἰών) and Plato's cosmological conception. In this chapter I offer an interpretation of Plato's definitional section (37d6-e3) that adequately connects Plato's metaphysical definition and cosmological conception.

A preliminary discussion of the framework outlined in the beginning of the *Timaeus*' cosmogony is needed as a basis for my analysis. In fact, the metaphysical *imitation* of αἰών is best understood in light of the overarching metaphysical imitation that defines the cosmogony as a whole.[62] In this framework, we will also be able to see that in the definitional section the metaphysical definition of time is only a provisional definition of the phenomenon 'time' that focuses on the goal for why time is created. That definition is in fact followed by a cosmological definition that completes it, insofar as it additionally illustrates how time is created. In this way, the definitional section already hints at the setup of the planetary revolutions described in detail later in the account.

In Section 2.1 I will outline the dualistic framework Plato employs to set up the metaphysical imitation and Keyt's critical remarks on the topic (subsection 2.1.1). Then, I will focus on three sets of features (proper, physical and ideal) which are crucial to outline a metaphysical imitation, because of their special relevance for the definitional section (sub-section 2.1.2). Moreover, I will briefly discuss how the account of time connects with the rest of the cosmogony (Section 2.2). On the basis of those general conclusions about the cosmogony and its framework, I move on to analyse the definitional section in two steps: firstly, I focus on the introduction of αἰών and its relation to the model, needed to explain the purpose for which time is created (Section 2.3) and, secondly, I discuss the two definitions of time and the essential relation to the cosmos and the planets they delineate (Section 2.4).

[62] My use of 'metaphysical' and 'ontological' in the thesis will be as follows. I am not using the two terms as synonyms. With 'ontological' and 'fundamental ontology' I refer to Plato's distinctions in terms of fundamental kinds, as discussed in Section 2.1. These are the intelligible and sensible kind, with the receptacle later included as a third (see p. 34). I will also talk about 'ontological constitution' or 'fundamental nature' of an item to focus on the fundamental kind it belongs to, thereby possessing certain defining features associated with it. 'Metaphysical' is used in contrast with 'physical'. For instance, I contrasts the *metaphysical* imitation of αἰών with a physical or mundane imitation, such as that of a person in a portrait: both the portrait and the person belong to the same fundamental kind, whereas in the first case the imitation stands between items of different kinds, αἰών and its image, time.

2.1 The metaphysical imitation

Plato's framework distinguishes two fundamental kinds, which I will refer to as the *sensible* or *physical* kind and the *intelligible* or *ideal* one.[63] The framework is outlined in the first section of the cosmogony, at 27d5-29b2, as it serves to frame the cosmogony as the establishment of a metaphysical imitation. Timaeus introduces the two fundamental kinds (27d5-28a1) as contradictory opposites ("*that which always is* and has no becoming, and *that which always becomes* but never is; τί τὸ ὂν ἀεί, γένεσιν δὲ οὐκ ἔχον, καὶ τί τὸ γιγνόμενον μὲν ἀεί, ὂν δὲ οὐδέποτε"), and he further characterises them as accessible through two different sorts of cognition – on the one hand, intelligence and, on the other, opinion acquired through perception (28a1-4).

Each following claim articulating the metaphysical imitation relies on the dualistic premise: (a) the claim that the cosmos had come to be, which necessarily follows from its physical nature (28b1-c2) and (b) since everything that has come to be must have a cause, and the cosmos is beautiful, the cause is identified in the divine craftsman (28a4-b1, 28c2-5).[64] (c) The choice of the model for the cosmogony is between models of the two fundamental kinds – one has come to be, as the cosmos, whereas the other is everlasting and always identical with itself (28c5-29b1). Given that the Demiurge is always doing the best, the inevitable choice is the latter, thereby establishing a *metaphysical* imitation between the everlasting model and the cosmos. This last step also establishes that the cosmos is the *image* of that model (τὸν κόσμον εἰκόνα τινὸς εἶναι, 29b1-2).[65]

A second, more specific enquiry concerning the model of the cosmos is presented at 29e7-31b3. The first part is concerned with the motivations behind the creation of the cosmos, which is to make it as fine as possible and as good as the Demiurge himself (29e7-30a7). This leads to a further choice, namely to choose the best *ideal* model, and the choice falls on the intelligible living being (30a7-30c1). Finally, there is a third choice to employ the best among the intelligible living beings

[63] The exegetical commitment I am assuming for the reading of Plato's dualism I propose is not demanding. It requires that the two kinds are mutually exclusive, such that for any object or phenomenon, it either belongs to one or the other, except for certain the special cases of the soul and the receptacle (see sub-section 2.1.2). The claim is compatible with different takes on the details of that metaphysical relation – even with Gail Fine's 'reluctant' reading of separation between the two fundamental kinds as independent existence (Fine 2003, pp. 292-295).

[64] Gábor Betegh highlights how the assumption of an intentional and intelligent cause fits with the etiological 'myths' Timaeus' speech structurally resembles (see Betegh 2010, pp. 222-224). Moreover, see Thomas Johansen on its classification as a craftsman (Johansen 2014, pp. 302-310). The Demiurge is qualified by features pertaining to the intelligible kind (e.g. at 37a1-2, τῶν νοητῶν ἀεί τε ὄντων ὑπὸ τοῦ ἀρίστου ἀρίστη γενομένη τῶν γεννηθέντων) so it would seem that it also belongs to that same kind. However, given his distinctive function as a cause, clearly different from the two fundamental kinds first introduced, I won't commit my reading to a particular classification.

[65] In the *Sophist*, εἰκόνες are presented as the sort of result of image-making (εἰδωλοποιία) that remains faithful to the model (235c8-236c8). I will translate εἰκών as 'image' and not as 'likeness' to adhere to Plato's characterisation of the physical domain in terms of its perceivable – and primarily visible – appearance while retaining the relational nature of the Greek term. In fact, in the dualistic framework, whereas the model can belong to either kind, the image will always belong to the physical kind. Moreover, I will argue that the *visible* nature of the εἰκών has a crucial importance in the case of the imitation of αἰών, as we will see in Chapter 5.

as a model, and that is the complete living being (30c2-31b3).[66] If the dualistic framework is the ontological groundwork for the cosmogony and the metaphysical imitation it involves, the imitation of αἰών should also be understood along the same terms.

2.1.1. Keyt's challenge to the metaphysical imitation

David Keyt has famously accused Plato's metaphysical imitation of stretching the model-image relation to absurd consequences. Keyt's general point is that in any attempt at imitation – be it a metaphysical one or between physical objects – there is a set of features that are essential to the model and should therefore be shared with a faithful image, and others which cannot, or are not expected to, be shared. To use Keyt's own example concerning the mundane imitation of a chariot, "the model has some features that a chariot maker will not want to copy and others that he cannot copy: its nicks and scratches, for example, and its age. He cannot make a chariot that is as old as his model".[67] The pertinent features to be replicated are named *proper features* (or attributes) by Keyt and they are contrasted with non-proper ones. As the metaphysical imitation is the focus of Keyt's discussion, the non-proper features discussed are labelled as *ideal features*: namely the features that distinguish the intelligible from the sensible kind.

In the *Timaeus*, we would expect that the imitation focuses on what characterises the form chosen for the creation of the cosmos, and, since the form selected is the intelligible living being, it has "only one feature that a sane craftsman would copy, having a soul in a body".[68] Yet, Keyt argues, Plato describes more than once the Demiurge as attempting to establish imitation between the cosmos and ideal features, in a way that makes him look like a mad craftsman. Keyt includes αἰών, read as 'eternity', among the ideal features that the Demiurge is not supposed to imitate in the cosmos.[69]

Keyt's remarks, I would argue, are on point, especially because they are in agreement with the general account of imitation presented by Plato in the *Cratylus*. There Socrates persuades Cratylus to accept that an image is not the same as an exact double of the original precisely because it is not identical to the original *in every respect*.[70] This suggests that Plato also considered that every

[66] In Section 3.1 I will argue against interpreting the intelligible living being as a genus of living beings, suggesting that it is rather a paradigmatic representative of a species of living being. At the beginning of Chapter 4 I will discuss what it could mean that the model is a living being.
[67] Keyt 1971, p. 232. Note that while in a physical imitation, the model might have non-proper features that are accidental (e.g. it might be damaged), in a metaphysical imitation, that is not the case.
[68] Keyt 1971, p. 232.
[69] The cases Keyt considers in arguing for his view are the uniqueness of the model, its 'eternity' and the completeness which justifies the sphericity of the cosmos (Keyt 1971, pp. 232-34).
[70] 432b-c5.

imitation necessarily involves non-proper features, not up for imitation. As generic features, then, ideal features are natural candidates to be identified as not up for imitation. Attempts to mitigate Keyt's criticism have been proposed with regard to the particular cases discussed by Keyt, although no one, as far as I am aware, focuses on his discussion of αἰών. Brad Berman, for instance, argues that for Plato, certain ideal features are intrinsically better than the original state of the physical world, so much so that it is not unreasonable to instantiate those features, as much as it is possible, in the physical world, even though they are non-proper features.[71]

That, however, is not the strategy I am pursuing. In Section 3.1 I will criticise Berman's reading, among others, on an exegetical level, arguing that no ideal feature is imitated by the cosmos, in the *Timaeus*, and that uniqueness, together with completeness and all-comprehensiveness, are proper features of the model. Most importantly, however, my criticism rests on conceptual grounds. I take it that Plato would agree with Keyt that ideal features are not to be imitated, for any sane craftsman. In fact, if we take the dualistic framework described above seriously, ideal features belong to the subset of non-proper features that *cannot* be imitated in the cosmos, even if the Demiurge wanted to. In my reading, then, Plato is well aware of the distinction between proper and ideal features as, in a metaphysical imitation, ideal features play the function of drawing the *difference* between the ideal model and the physical image, whereas proper features are the ones that can and should be shared between the two. To substantiate my claim, however, I will first need to further articulate and expand Keyt's terminology.

2.1.2. Ideal, physical and proper features

The terminology I am proposing is an elaboration of Keyt's and focuses on sets of features that define the dualistic framework. *Proper features*, as we established, are those that we would expect the Demiurge to bring about in the creation of an image, as they define the specificity of the model. Opposed to proper features we have a broad category of *non-proper* ones, which includes those that are not relevant to the imitation and those that cannot possibly be imitated: in Keyt's example of a mundane imitation, we cannot possibly make the copy of a painting being as old as the painting itself. My taxonomy of non-proper features is not intended as exhaustive, as the focus will be on two sets of non-proper features that play the distinctive function of ontological difference-markers in Plato's dualistic framework. These are *ideal* and *physical* features.

[71] "Provided that, for Plato, being is better than the alternative ontological standings, the demiurge makes his creation better in making it changeless in this way, just as he makes it better in making it as unified and as unique as possible […]. The demiurge, then, in making the world as unified, unique, and changeless as is possible for it, is not acting merely on the grounds that his model possesses those features" (Berman 2016, pp. 189-190).

As mentioned above, Plato's ontological dualism, as it is set up at the beginning of the *Timaeus*, admits of two fundamentally different kinds that are at first introduced as contradictory opposites, i.e. the two kinds are exhaustive of what there is, and they are exclusive, so that any item belongs to either one or the other. The opposition is set up by means of ideal and physical features, as the two kinds are consistently presented *via* one or more features of one set while contrasted with one of the other set, establishing fixed pairs of opposite features.

Here are the pairs of contradictory features in the order they first appear in the cosmogony, up to Plato's account of time: cognition *via* intelligence coupled with argument, as opposed to *via* opinion coupled with unreasoned perception (28a1-2, 29b5-c3, 37b1-c7,τὸ μὲν δὴ νοήσει μετὰ λόγου περι ληπτόν, τὸ δόξῃ μετ' αἰσθήσεως ἀλόγου δοξαστόν), 'always being identical to itself' is opposed to 'coming into being' and 'being destroyed' (28a2-3, 28a6-b2, 29a1-2, 29a6-b1, 37b1-c7, 38a3-5, ἀεὶ κατὰ ταὐτὰ ὄν, γιγνόμενον καὶ ἀπολλύμενον), 'always being', and also 'everlasting' are opposed to 'come to be' and 'begotten' (29a3-6, 36e5-37a2, 37c6-7, 37e5-38a6, ἀίδιον, γεγονός and γεννητός), 'intelligible' is opposed to 'visible', 'tangible', 'perceivable' and 'corporeal' (28b7, c1, 30c7-31a1, 31b4-6, νοητόν, ὁρατόν, ἁπτὸν, αἰσθητόν, σῶμα ἔχων), motionlessness is opposed to having motion (38a2-6, ἀκινήτως, φερόμενον, κίνησις).[72] With more than one pair, the nominalisation is an explicit reference to the fundamental kind they describe (e.g. τὸ ἀίδιον). However, even as simple adjectives attached to particular items (e.g. νοητῷ ζῴῳ, 39e1), physical and ideal features characterise them in terms of their ontological constitution, usually to draw a contrast with an item of the opposite fundamental kind.

Either the set of physical features or the set of ideal ones listed above defines the ontological constitution of each item in Plato's ontology presented up to that point in the dialogue, so that for any predicated feature of the set, the other features would normally also apply. An example of a similar entailment is given when Timaeus asks whether the cosmos had an origin or always existed. His conclusion is that it had an origin, thereby being begotten, in virtue of its visible and corporeal nature. In fact, he argues, everything of that sort is an object of opinion and perception and, thus, one that becomes and is subject to generation (γιγνόμενα καὶ γεννητὰ, 29b7-c2). *All* the physical features listed above, I would argue, are predicated of the cosmos, as those are also defining its constitution as a physical object. As we will see in Section 2.3 and 2.4, this is evident in the definitional section, where coming into being and motion belong together with the cosmos, just as everlastingness and the absence of motion with its model.

[72] Later restatements of this ontological opposition by means of ideal and physical features can be found, for example, at 48e6-49a2, 50c5-d and finally at 92c7. Examples of the ontological dualism appear throughout the *Corpus Platonicum* and I will limit my list to a few examples: *Phd.* 75d, 78b-79e, 106d-107a; *R.* 484b4, 485b2, 500c2-3, 527b5, 7, 585c1-2, 611e3; *Phlb.* 59a7. As for my translation of ἀίδιος as 'everlasting', see *fn.* 34.

Admittedly, Plato's fundamental ontology is eventually more complex than the dualistic framework presented above. At 48e2-49a6 and later at 52d2-4, Plato does include a third fundamental kind, the receptacle, for the purpose of grounding the sensible kind. Its ontological constitution is defined by a set of features which groups together some ideal and physical features, i.e. it is not generated, but it is in motion (52d4-53a3). However, this additional kind does not endangers the exclusive and exhaustive nature of each pair of ideal and physical features, for two reasons: (1) the ontological constitution of the receptacle is characterised by either one or the other feature in the pair of opposites (e.g. it is always in existence, thereby not subject to generation nor destruction, τρίτον δὲ αὖ γένος ὂν τὸ τῆς χώρας ἀεί, φθορὰν οὐ προσδεχόμενον, 52a8-b1). So, although, unlike for the other two kinds, the receptacle is not defined by either sets of features as a whole, it still holds true that each pair is exhaustive and any item is qualified by either one or the other.

Moreover, (2) the status of the receptacle is significantly different from the sensible and the intelligible kind, insofar as, beyond its ontological constitution, it is rather defined by featurelessness (50a4-51b5): we could describe the specificity of the receptacle as that of having no proper features but only physical and ideal ones. The featurelessness of the receptacle is in fact what warrants its function in grounding the sensible kind as that in which it is instantiated. It is not surprising, then, that the receptacle cannot bear any metaphysical imitation with the other two kinds, as it rather *enables* the imitative relation between the other two. As such, the receptacle has no bearing in Keyt's discussion of the metaphysical imitation and its relevant features, since, by its very nature and function, it cannot take part in it.[73]

2.2. The place of the creation of time within the cosmogony

Before setting out to examine the definitional section in light of my classification of features, the relation between the account of time and Timaeus' speech as a whole should be addressed in one more respect, namely the significant position of the creation of time in the cosmogony, and how it ties in with what precedes and follows. The question hasn't received much attention in the

[73] A further question is how the immortal part of the soul should be classified in this framework. Gábor Betegh convincingly argues against the claim that the soul ultimately belongs to the physical domain, being a special kind of body (Carone 2005) and against interpreting it as a third fundamental kind (Fronterotta 2007). Betegh argues that the account of the soul in the *Timaeus* builds on the previous enquiry in the *Phaedo*, and that, among other things, we get a final verdict on the affinity argument (78b-79e), inasmuch as the original mixture described at 35a1-b3 is a composite of the sensible and intelligible kind, thereby being intermediate between the two (τῆς ἀμερίστου καὶ ἀεὶ κατὰ ταὐτὰ ἐχούσης οὐσίας καὶ τῆς αὖ περὶ τὰ σώματα γιγνομένης μεριστῆς; Betegh 2018 pp. 125-128). If so, souls are a unique case of a metaphysical composite, as contrasted to composites of things belonging to the same fundamental kind. Such a mixture would then reasonably share in many features of physical objects (e.g. it is generated and possibly destroyed, in motion, shaped in a circle), while also lacking others, such as visibility and, possibly, tangibility.

literature.[74] However, I would argue that addressing the point is important because, just as with the dualistic framework, the account of time builds on the progress made in previous stages of the cosmogony. In particular, at the beginning and the end of the account there is a special emphasis on clarifying the stage of the cosmogony Timaeus is moving to and from, suggesting that the position in the narrative provides important preliminary insight into how Plato conceives of time. I will show that Plato highlights the continuity between the creation of time and the creation of the cosmic living being, providing *prima facie* reason to take time as the imitation of a *proper* feature.

The account of time seemingly comes after the conclusion of the first stage in the cosmogony. By the beginning of the account, despite not yet having any living being within itself, the cosmos is already the sort of living being that can comprehend all the physical, visible living beings, in virtue of the completeness it shares with the model (see Section 3.1). It is self-sustaining and sempiternal: as seen in Chapter 1, it starts a divine life by unceasingly revolving in accordance with the circles of the cosmic soul (36c4-37a2).[75] The circular living motion of the cosmic soul is moreover presented as a systematically exerted cognitive activity towards everything within the cosmos and 'outside', i.e. the ideal kind (37a2-c5).[76] I will refer to the goal of bringing to completion the cosmic living being *per se* as s*tage 1* in the cosmogony, as opposed to *stage 2*, i.e. the creation of the four species of living beings within the cosmos that are also prescribed by the model. The account of time sits between stage 1 and 2, leaving ambiguous something significant, namely whether time is part of the creation of the living being constituting the whole, of the living beings that are parts, or something entirely different, as the imitation of 'eternity'.

The account of time opens with the description of the Demiurge contemplating the cosmic living being. The cosmos is already "alive and set in motion" (κινηθὲν καὶ ζῶν, 37c6) when the Demiurge decides to make it even more like its model, and thereby creates time. It is plausible that the initial emphasis on the stage of completion of the cosmos aims to show that time could not have been brought about without a living cosmos in circular motion, thus presenting stage 1 of the cosmogony as a precondition for the creation of time. This implication is reasonably connected with what is captured in the ἅμα relation touched upon in Section 1.1: there could be no time without a cosmos, as they necessarily coexist from their generation to their counterfactual destruction.

[74] The only author touching on the subject matter is, as far as I am aware, Karel Thein. His claim is that the planets, as instruments of time, are the living beings that connect cosmic and human nature, and this has a bearing in the fact that the creation of time is introduced after the cosmic living being is completed, and yet before the mortal species of living beings become the subject matter, as planets have an intermediate function in relation to both (Thein 2015, p. 10-14).
[75] The cosmos does not need any of the living beings within it as organs for its own preservation. See Section 3.1.
[76] As pointed out by Thomas Johansen, in the *Timaeus* a literal identity is postulated between the regular rotations of the cosmic soul and its thinking activity, as the outward and inward manifestations of the same activity (Johansen 2004, p. 139). This will be important in the continuation of the chapter, because the circular motion of the cosmos, crucially involved in the creation of time, just is the unfolding of cosmic life, as consisting in a purely intellectual activity.

However, if the order of succession between the accounts is meant to present the cosmos as a precondition for time, the ἅμα relation is not symmetrical as we would expect: the cosmos, as a living being, does not require time in order to be brought about, since the decision to create time follows stage 1. Based on the narrative order alone, we could imagine a flawed Demiurge withdrawing before the creation of time, and still leaving behind a single, self-sustaining, cosmic living being. In addition, the identity claim presented at 39d1 between time and the planetary revolutions – discussed in Section 1.1 – rather suggests that Plato's account of time belongs to stage 2 of the cosmogony.

In order to reconcile the ἅμα relation with time belonging to stage 2, Brague hypothesises that the cosmos under discussion in the account of time is no longer the empty cosmic living being described up to that point, but the οὐρανός filled with the heavenly species of gods, so that such a cosmos would necessarily coexist with time, as time is identified with the planetary revolutions.[77] Nonetheless, I would argue that there is significant evidence against Brague's solution, given how time is incorporated in the cosmogony, and that a different solution is available.

The cosmos, in the account of time, *pace* Brague, clearly is not yet the one filled with heavenly gods. In fact, if it were as Brague hypothesises, the term 'cosmos' would already include the planets and their revolutions, which are identified with time, so the ἅμα relation between the cosmos and time would be too weak. Instead, the ἅμα relation is presenting two distinct, although not independent, terms, which in principle might not coexist: the cosmic living being and time, identified with the planetary revolutions. That same distinction is presented in the concluding summary at 39d8, where the planets are described as traversing the heaven (δι' οὐρανοῦ πορευόμενα), which therefore means 'the cosmic living being within which they move'.

Additionally, there is textual evidence suggesting that the creation of time rather belongs in stage 1, as part of the creation of the cosmic living being. In fact, at the beginning of the definitional section, Timaeus claims that the creation of time stems from the Demiurge's judgement in contemplating the cosmic living being, thinking it could be *even more* like the model (ἔτι δὴ μᾶλλον ὅμοιον πρὸς τὸ παράδειγμα ἐπενόησεν ἀπεργάσασθαι, 37c8-d1) and in the following sentence the creation of time is presented as completing the creation of the universe (τὸ πᾶν…ἀποτελεῖν, 37d2). The entire passage, then, seems to highlight a continuity with stage 1 rather than a departure from it.

Certainly, stage 2 of the cosmogony is also a stage whose goal is to make the cosmos 'even more like its model'. Importantly, however, the goal of creating the four species of living beings within the cosmos is not introduced until *after* the conclusion of the account of time, despite the fact

[77] Brague 1982, p. 52. Πρώτην καὶ πρεσβυτάτην θεῶν ὅσοι ἐντὸς οὐρανοῦ γεγόνασιν, 40c2-3. Brague, together with most interpreters, holds that all the heavenly gods are equally involved in the creation of time. I will argue in Section 5.1 that the planets (and the Earth) have a distinctive function as instruments of time.

that the planets belong to the heavenly kind: "now the other respects already, as far as the generation of time (Καὶ τὰ μὲν ἄλλα ἤδη μέχρι χρόνου γενέσεως), had been made in a resemblance that conformed to the model; but it was still unlike the model in that it did not yet comprehend all living beings generated within it (τὸ δὲ μήπω τὰ πάντα ζῷα ἐντὸς αὐτοῦ γεγενημένα περιειληφέναι). This remaining task he went on to perform, casting the cosmos into the nature of its model".[78] The goal of the creation of the planets, then, should be kept distinct from the one of filling the cosmos with the four species of living beings.

It seems plausible to assume, then, that, before the creation of time, the cosmos as a living being still falls short of the model, as, despite being self-sustaining, it is not yet the living being it should be. In fact, unlike the model, the cosmos is not yet αἰών-ly. Only at this point the planets are introduced, as instruments to accomplish that goal, but this is compatible with the claim that they are still needed to complete stage 1 of the cosmogony. Their creation, in fact, is entirely contingent on the contrivance of the Demiurge to create an αἰών-ly image, and does not correspond to a prescription from the model, whose αἰών-ly feature is predicated of the whole, not the parts. In this sense, then, albeit not terminologically correct, Brague's observation correctly assesses the planets' role in *completing* the cosmic living being, *via* the creation of time.[79] Time is in fact an essential feature of *that* living being, hence explaining the ἅμα relation, as we will see in sub-section 4.2.2.

The above reading is supported by two further pieces of evidence. Firstly, the description of the beginning of cosmic circular living motion, which marks out the completion of stage 1 of the cosmogony, already includes a reference to time: "And, rotating within itself, it initiated a divine beginning of unceasing, intelligent life *for all time* (πρὸς τὸν σύμπαντα χρόνον)".[80] As pointed out in Section 1.2, the expression resembles the later one at 38c2, where it is compared with 'for all αἰών'. Then, Timaeus gives the reader an anticipation of what comes next, to highlight that to live 'for all time' is thought of as an essential feature of the cosmic living being: a cosmos whose life is not qualified as 'for all time' would be a deficient cosmos.[81]

Secondly, in the concluding recapitulation (39d7-e2), the planets are presented as moving along their circular trajectories so that *this* (ἵνα τόδε, 39d8) – where 'this' is, although not explicitly,

[78] 39e3-40a2. Zeyl's translation phrases the passage as if time already were part of stage 2, thus translating "prior to the coming to be of time" (Zeyl 2000, p. 26). The contrast between the two passages above, however, seems to speak against his reading.

[79] It is true that the fixed stars' function is also for the sake of the whole, insofar as they decorate the cosmos (νείμας περὶ πάντα κύκλῳ τὸν οὐρανόν, κόσμον ἀληθινὸν αὐτῷ πεποικιλμένον εἶναι καθ' ὅλον, 40a5-7). I would argue, however, that the planets play a distinct function in relation to the cosmos, namely they are cooperating in the creation of time, whereas the fixed stars contribute to the completion of the cosmos by simply filling it as required parts.

[80] 36e4-5.

[81] Thein takes this mention of time to mean 'time as flow', as opposed to the measurable time that is created afterwards (Thein 2015, p. 9). It doesn't seem a viable interpretation to admit a twofold notion of time for the same reason we would reject Proclus' twofold time interpretation (see Section 1.1), namely that Plato never even suggest a polysemic use of χρόνος, nor any of the early sources reads it that way.

the universe, just as at 39e9 – becomes most like (ὁμοιότατον) the intelligible and complete living being chosen as a model, by way of imitating its διαιώνια nature. The planets are here presented implicitly (and explicitly at 41e5 and 42d5), as instruments deployed towards a goal, the creation of time, which ultimately concerns the cosmic living being they are in. Correspondingly, the διαιώνια nature, is not predicated of anything in the model, but of the model *as a whole*.

If my reading is correct, then the intermediate position in the cosmogony is expressive of the uniqueness of time, which does not fully fit with either stage. It does not belong to stage 1 insofar as it already involves the creation of other living beings within the cosmos. However, those living beings are instrumental to the creation of time, a feature needed to complete the cosmic living being *per se*, hence not fitting with stage 2 either. As such, the creation of time would seem to be an intermediate, third stage of cosmogony, sharing some features with both stages.

For the remainder of the analysis, however, it is of special importance that time is seemingly introduced, in continuity with stage 1, as an essential feature of the cosmic living being *per se*. In fact, this shows that we should *expect* time and αἰών to be accounted for in the definitional section as proper features of the cosmic living being and its model respectively. Yet, the reading of αἰών as 'eternity' is still on the table, contending that while time is essential to the cosmos, it is not *qua* living being, but rather *qua* imitation of an *ideal* feature, as it makes the cosmos form-like. This latter reading is addressed in the next section.

2.3. Introducing αἰών (37c6-d4)

> Now when the father who had begotten observed it [i.e. the cosmos] set in motion and alive, a thing that had come to be as an idol of the everlasting gods (τῶν ἀιδίων θεῶν γεγονὸς ἄγαλμα), he was well pleased, and in his delight he thought of making it more like its model still. So, as the model was itself an everlasting living being (ζῷον ἀίδιον ὄν), he sought to bring the universe to completion in such a way that it also was like that (τοιοῦτον ἀποτελεῖν), so far as it might be. Now it was the living being's nature to be αἰών-ly (ἡ τοῦ ζῴου φύσις οὖσα αἰώνιος), but it is not possible to bestow it completely upon anything that is begotten (τῷ γεννητῷ παντελῶς προσάπτειν οὐκ ἦν δυνατόν).

The first half of the definitional section introduces the αἰών-ly nature of the model as that which is to be imitated next in the cosmos. In so doing, the section aims to introduce the cause characterising the works of intelligence, namely the purpose for which time is created by the Demiurge.[82] That this is the approach chosen by Plato is shown by how the metaphysical definition of time, to be discussed in the next section, focuses exactly on the purpose of the creation of time, namely to

[82] For an extensive analysis of the role of causes and auxiliary causes in the works of intelligence, with a particular focus on the gift of sight by the lesser gods, see Johansen 2004, pp. 106-116.

imitate αἰών. As the first step towards that definition of time, the overarching metaphysical imitation that defines the cosmogony is brought once more to the foreground, *via* the ἄγαλμα metaphor. In particular, the recapitulation focuses on a specific pair of physical and ideal features: 'begotten' and 'come to be' on the physical side, contrasted with 'everlasting' on the ideal side.[83]

The opposition of those features is presented twice. It first occurs as part of the ἄγαλμα metaphor. The ἄγαλμα is the cosmos and it *had come to be* as an idol of the *everlasting* gods (τῶν ἀιδίων θεῶν γεγονὸς ἄγαλμα).[84] Moreover, it was *begotten* by the Demiurge, as its father (ὁ γεννήσας πατήρ). I won't address the longstanding debate concerning the meaning of ἄγαλμα and the connected problem of identifying the gods in detail. For the purpose of my reading, it is sufficient to point out that, when taking the context and previous theoretical commitments into account, the interpretation that takes the 'everlasting gods' to refer to the heavenly gods is implausible.[85]

Two objections can be moved to that interpretation. Firstly, the recapitulation aims to describe the result of the cosmogony up to that point, but the heavenly bodies have not been mentioned before. Secondly, the passage contrasts the ἄγαλμα and the gods by opposing their respective physical and ideal features, whereas the ontological constitution of the cosmos and the heavenly gods is the same – both are physical gods. On that basis alone, we should rather expect the gods to be identified, in a metaphorical sense, with ideal objects (ἀίδιος is used in that sense both at 29a5 and 37d1).

The precise identity of the gods, however, can only be reconstructed tentatively. It should be noted that ἄγαλμα is used elsewhere in Plato's work in a metaphorical sense derived from its traditional function as an idol. For instance, in *Laws*, Book XI, dishonouring parents is compared to dishonouring the gods, presenting parents as the most important ἀγάλματα of the gods. The function of an ἄγαλμα, then, is that of a stand-in for the gods, as an *indirect* visible manifestation.[86] If so, a metaphor involving ἄγαλμα and gods would fittingly represent the cosmos' metaphysical imitation

[83] See *fn.* 34 for my translation of ἀίδιος as 'everlasting'.

[84] 'Idol' captures the imitative as well as votive aspect of ἄγαλμα: "an image or similitude of a deity or divinity, used as an object of worship" (*OED s.v.* 'idol').

[85] Most of the scholars, from Cornford onwards (Cornford 1937 pp. 99-102; Brague 1982, pp. 50-51; Broadie 2012, *fn.* pp. 73-74), seem to agree that the everlasting gods are the heavenly gods, hence understanding ἄγαλμα as a 'shrine' for them. The main textual support given to the reading is at 40b5, where the heavenly gods are effectively described as 'everlasting' (ζῷα θεῖα ὄντα καὶ ἀίδια). However, as seen in my discussion in Section 2.1.2, that is the only instance of 'everlasting' that does not employ ἀίδιος as an ideal feature synonym of 'always being' and hence opposed to 'begotten' and 'come to be' (see sub-section 2.1.2). For a more comprehensive criticism of the 'heavenly bodies' reading, see Karfik 2004, pp. 123-126. Moreover, see Joachim Kraaij's recent proposal to revise the Greek text of the passage, providing contextual arguments for why the generally accepted version might be corrupted (Kraaij 2016).

[86] Τοὺς μὲν γὰρ τῶν θεῶν ὁρῶντες σαφῶς τιμῶμεν, τῶν δ' εἰκόνας ἀγάλματα ἱδρυσάμενοι *Lg.* XI, 930e3-931e6. Moreover, ἄγαλμα also appears in the same metaphorical sense in the *Epinomis*, at 984a2, to present the relation between the heavenly bodies and the divine souls moving them; in the *Symposium*, at 222a4, to present instances of virtue as ἀγάλματα of virtue; and in the *Phaedrus*, at 252d7, where a man is made an ἄγαλμα of his proper god.

of the model, since an everlasting living being, as the model is, would rightly be manifested as a metaphorical god by the cosmic ἄγαλμα.

However, the cosmos is an idol of the gods, plural. As far as I can see, there are two options to account for this plurality. Either (1) 'gods' refers to the model, which has a plurality of intelligible living beings within it (mentioned at 30c2-31a5), or (2) it refers to both the model and the Demiurge – here referred to as a father (37c7) and earlier as a god.[87] As far as I am aware, this second hypothesis has not been considered in the debate.[88] However, the Demiurge is often presented as 'always existing': for instance, at 37a1-2, as the best of the intelligible and always existing things (τῶν νοητῶν ἀεί τε ὄντων ὑπὸ τοῦ ἀρίστου), or earlier, at 34a8, as the god that always exists (ὄντος ἀεὶ λογισμὸς θεοῦ). The ideal feature 'always existing', as we have seen in sub-section 2.1.2, is presumably synonymous with everlasting, as both are contrasted with the same physical feature, i.e. having come to be. Presenting the Demiurge as an everlasting god would also be warranted, then, when we consider the cosmos as a manifestation of the Demiurge's craft that bears resemblance to him, being a physical god.[89]

My reading of the ἄγαλμα metaphor also matches the second and most important contrast between 'everlasting' and 'begotten', at 37d1-4. As seen in sub-section 1.2.1, the reference to the model as a living being that exists *everlastingly* (ζῷον ἀίδιον ὄν) is an important intermediate step to present that same model as αἰών-ly. Moreover, in the final sentence of this sub-section, the universe cannot be completely αἰών-ly because it is *begotten* (τῷ γεννητῷ), i.e. not everlasting. The emphasis on the pair of features underscores, once more, the ontological opposition between the model and the image introduced at the beginning of the cosmogony, even though their connection with the αἰών-ly nature remains to be determined.

As we have seen in sub-section 1.2.1, contemporary scholars take αἰών-ly, interpreted as 'eternal', to be an *ideal* feature. It is then either a synonym for or a feature entailed by ἀίδιος, everlasting. Their reading is accompanied by the translation of τοιοῦτον in 37d2 as 'in that respect' or 'that character', so that the object of imitation chosen for the cosmos is the everlastingness of the model *per se*.[90] However, this needn't be the case. The pronoun τοιοῦτον can in principle be

[87] The first option is defended by Karfik (Karfik 2004, p. 123). However, a similar worry to the one concerning the heavenly gods could be raised, insofar as the other intelligible living beings haven't been a direct object of imitation in the cosmos yet.

[88] This option has been suggested to me by Thomas Johansen in conversation.

[89] Plutarch also recognises the importance of describing the Demiurge not just as a maker, but as a father, given that the resulting cosmos is alive and divine, just as the Demiurge is (Plu. *Plat. Quaes.* II, 1001B1-7). As Broadie points out, the question of whether the Demiurge and the intelligible living being are intended to be the same entity is a separate question, as in the *Timaeus* the two are consistently presented as if they were distinct entities, fulfilling two different functions (Broadie 2012, p. 27).

[90] Cornford, for example, translates "so as that pattern is the living being that is for ever existent, he sought to make this universe also like it, so far as might be, in that respect" (Cornford 1937, p. 97), and Zeyl "so, as the model was itself an

referring to either (a) ζῷον ἀίδιον ὄν or (b) ἀίδιον, and the choice does not hinge on the syntax alone. While option (b) would suggest reading αἰών-ly as an ideal feature, option (a) would suggest reading αἰών-ly as a proper feature. Let us examine the plausibility of each option in turn.

If τοιοῦτον refers to the ἀίδιον character, the object of imitation would already be narrowed down. The following sentence, introducing the αἰών-ly nature of the model, would then be either redundant or puzzling. It would be redundant if αἰών-ly and everlasting were synonyms, as no information would be added in the second sentence. It would be puzzling if 'everlasting' entails αἰών-ly as distinct ideal feature. If the Demiurge finds its object of imitation in an ideal feature, such as 'everlasting', the αἰών-ly nature derived from it would also be an ideal feature. From what we established in sub-section 2.1.2, it is reasonable to assume that all ideal features go together in defining the ontological constitution of ideal objects, so it is not clear what the introduction of the αἰών-ly feature as an object of imitation *via* the imitation of the everlastingness of the model would add.

Moreover, in the definitional section, the model is explicitly presented as relating to the intelligible and everlasting *living being* employed throughout stage 1 of the cosmogony (ζῷον, 37d1; τοῦ ζῴου, d3). The same emphasis is present in the final recapitulation of the account of time (τῷ τελέῳ καὶ νοητῷ ζῴῳ, 39d10-e1). However, if αἰών-ly were an ideal feature following from 'everlastingness', the emphasis on it being part of a living being's nature would be unnecessary, and we would rather expect a generic reference to the everlasting model, as in 29a5 (τὸ ἀίδιον). In fact, having an ideal feature as an object of imitation while stressing that the model is a living being strikes me as odd (see Section 2.2).

In addition to these contextual objections, the main criticism I have against reading αἰών-ly as an ideal feature is connected with my reconstruction of Plato's dualistic framework in Section 2.1. My objection runs like Keyt's criticism. What τοιοῦτον refers to as an object of imitation cannot be the ἀίδιον character of the model. In fact, in Plato's dualistic framework, having a share in an ideal feature for a physical object like the cosmos is impossible, as the cosmos' ontological constitution is *defined* by the set of physical features, even the Demiurge is powerless, in that respect. As seen above, 'everlasting' is paired with its physical opposites 'come to be' and 'begotten'. The latter two are the one predicated of the cosmos – even in this very passage. If my reconstruction is correct, there is no intermediate state between 'begotten' and 'everlasting' since they are *contradictory* pairs. So, if the αἰών-ly nature were synonymous with or followed from the everlastingness of the

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everlasting Living Thing, he set himself to bringing this universe to completion in such a way that it, too, would have that character to the extent that was possible" (Zeyl 2000, p. 24). Cornford and Zeyl's translations both strongly suggest that the intention of the Demiurge is to make the universe resemble the everlasting living being *as* being everlasting, but this is in no way implied in the Greek text.

model, i.e. if it were an ideal feature, the physical, and hence begotten cosmos could not possibly become αἰών-ly.[91]

Instead, if we read τοιοῦτον as referring to ζῷον ἀίδιον ὄν, where 'everlasting' and 'living being' are equally necessary conditions for the model to have an αἰών-ly nature, αἰώνιος, unlike ἀίδιον, would be a feature specific to the everlasting living being chosen as a model, i.e. a *proper* feature. In this reading, moreover, Timaeus would appropriately use 'everlasting' and 'begotten' to underscore once more the ontological opposition between the model and the cosmos, while maintaining that it is possible for the cosmos to become αἰών-ly, albeit not completely (τῷ γεννητῷ παντελῶς προσάπτειν οὐκ ἦν δυνατόν, 37d4).[92]

Note that my reading acknowledges the importance of the everlasting-begotten opposition for the introduction of αἰών. Having an αἰών-ly nature or being completely αἰών-ly is only possible for an *everlasting* living being. The ontological constitution, therefore, does get in the way of a flawless imitation in the *begotten* cosmos. As we will see in the next section, a contrivance of the Demiurge works around the ontological constraints inherent to the cosmos, so that similarity with the model is retained.[93] The need to shift the focus back to the metaphysical imitation, then, arises from the peculiarity of αἰών, that is a proper feature of the model while also being grounded in its ontological constitution. The connection αἰών bears with everlastingness, life and completeness will be accounted for in full in Sections 3.2 and 3.3. For the time being, although its meaning remains indeterminate, αἰών-ly is presented in the definitional section as a proper feature of the model, and, because of that, the Demiurge proceeds to craft a cosmic image – although not without difficulty.

[91] As seen in sub-section 1.2.2, Patterson agrees that the ontological constitution is fixed. However, he still claims that αἰών, as 'eternity', is imitated *via* sempiternity, i.e. the endlessly ongoing persistence of the cosmos. Sempiternity, he argues, is the physical version of αἰών. In my reading, however, the sempiternity of the cosmos cannot be the ontologically intermediate state between αἰών itself and no imitation. Even if αἰών-ly was synonymous with 'everlasting', to be everlasting, in Plato's understanding, is to be entirely free of generation or destruction, which is a condition that cannot be attained nor approximated by anything physical, precisely because of its physicality. As the Demiurge points out at 41a7-b7, the ontological constitution of the physical gods remains the same as that of any physical item, as what makes them quasi-indissoluble and quasi-immortal is the external good will of the Demiurge, not the bonds they are constituted by. Their intrinsic nature cannot be altered, as they belong to the physical kind.

[92] I will further address the claim that αἰών-ly is a specific feature of the model in Section 3.1, and there I will argue that, in addition to being everlasting and a living being, the model is also characterised by its completeness (κατὰ πάντα τελέῳ, 30d2; τῷ παντελεῖ ζῴῳ, 31b1). This is significant because the adverb qualifying the αἰών-ly nature of the model, that cannot be achieved in the cosmos, is παντελῶς.

[93] The special emphasis on the artificiality of time, as an image of αἰών, when compared with the natural αἰών-ly condition of the model is also evident in the use of the verbs presenting the creation of time in the definitional section: διακοσμῶν (37d5), ἐπενόει…ποιῆσαι (37d5), ποιεῖ (37d6), συνισταμένῳ (37e2) and μηχανᾶται (37e3), which is later employed to describe the arrangement of the planetary revolutions (μεμηχάνηνται, 47a6).

2.4 Time as a cosmic phenomenon (37d5-e3)

> And so he began to think of making a moving image of αἰών (εἰκὼ κινητόν τινα αἰῶνος): and, in the very act of ordering, he made the heaven an αἰών-ly image, proceeding according to number, of αἰών, abiding in unity (καὶ διακοσμῶν ἅμα οὐρανὸν ποιεῖ μένοντος αἰῶνος ἐν ἑνὶ κατ᾽ ἀριθμ-ὸν ἰοῦσαν αἰώνιον εἰκόνα). This, of course, is what we now call 'time'. For before the heaven came to be, there were no days or nights, nor months or years. But now, together with framing the heaven, he devised their generation (ἅμα ἐκείνῳ συνισταμένῳ τὴν γένεσιν αὐτῶν μηχανᾶται).

In the second half of the definitional section the focus shifts again from the model to the image, i.e. the cosmos, or heaven. In fact, once the αἰών-ly nature of the model is established as the object of imitation, the Demiurge plans to make a moving image of αἰών, which I labelled 'metaphysical definition of time'. As mentioned earlier, however, there are two versions of the definition of time, the second being the cosmological one (37d5-7). In this section I will argue that the two are not only compatible, but the latter is just a complete version of the former. In fact, Plato introduces them one after the other to highlight two concurring aspects of the overall explanation of time and its creation.

On the one hand, as seen in Section 2.3, the metaphysical definition focuses on the purpose that time fulfils (i.e. to imitate αἰών in a different medium), that for the works of intelligence is also the most crucial explanation. On the other hand, the metaphysical definition is not complete, in itself, as it does not address how the moving image of αἰών is made. The cosmological definition, instead, retains the information provided in the first definition while also making explicit, in a comparison with αἰών, the sort of arrangement of the cosmos time consists in, thus focusing on the auxiliary causes the Demiurge deploys to obtain such a result. This latter aspect is only hinted at in the definitional section, but it is covered extensively in the later account of the creation of the planets and their revolutions, as we will see below.[94]

Before we discuss the details of this sub-section, however, let us look at the first sentence, which, as noted by Brague, presents a puzzle. Brague argues that the image (εἰκὼ τινα αἰῶνος, 37d5; αἰώνιον εἰκόνα, d7) Timaeus refers to must be the cosmos, as, after all, the cosmos has been described as an image throughout the cosmogony. Hence, the alleged metaphysical definition of time would not be a definition of time at all, but rather a description of the newly acquired imitative relation of the cosmos. In Brague's reading, time, understood as an intelligible and invisible aspect,

[94] Thee order of exposition of definitional section of the account of time can be fruitfully compared with the account of sight, where first we have an elaborate explanation of the auxiliary causes by means of which sight takes place (i.e. how) and then we learn the intended purpose of sight (i.e. why), that is the good for which it is made (see Johansen 2004, pp. 106-110). However, in the case of time, unlike in the case of sight, the auxiliary causes of time, i.e. the planets, are also directed by the intelligence of the heavenly bodies, as we will see in Section 5.3.

is rather manifested through, and not identified with, the moving image of αἰών which the cosmos becomes.[95]

However, if we look beyond the definitional section, there is strong evidence that time itself is described as that which imitates αἰών in the cosmos (χρόνου αἰῶνα μιμουμένου, 38a7). Moreover, time later explicitly qualifies the existence of the cosmos, in the same way as αἰών qualifies that of the model (πάντα αἰῶνά […] τὸν ἅπαντα χρόνον, 38c1-2). Hence, I won't follow Brague's reading in this respect, but understand the imitative relation as it has been traditionally understood: as a relation between time and αἰών on the one hand, and the cosmos and the model on the other, so that the image of αἰών would be time, just as the cosmos is the image of the model.

However, Brague's rightly highlights the fact that the two imitations cannot be conceived as separate ones, as one entails the other. In fact, as I argued in Section 2.3, the αἰών-ly nature is introduced as a proper feature of the model to be imitated in the cosmos. Given the transition from the imitation of the αἰών-ly nature to the imitation of αἰών, we can hypothesise that the two ultimately mean the same. A definition of αἰών is given at 37d6, as 'remaining in unity' (μένοντος αἰῶνος ἐν ἑνὶ), and, if my reading is correct, 'remaining in unity' applies to the model, *via* the adjective αἰών-ly. Then, the relation between the model and αἰών is one between an object and its proper feature, and we should expect the same relation to hold between the cosmos and time.

If my reading is correct, we can draw a distinction between the moving image of αἰών and the αἰών-ly image without taking these to be separate imitations. While the αἰών-ly image refers to the cosmos once it imitates the model *qua* being αἰών-ly, the image of αἰών singles out the specific creation required to make the living being αἰών-ly. Hence, both ultimately are used to introduce time, although, to be precise, the αἰών-ly image rather describes the cosmos once time is created as part of it (see next sub-section). Either way, time cannot exist apart from the cosmos because it is conceived by Plato as an essentially *cosmic* feature. Finally, the imitation, as presented in the metaphysical definition requires further specification, as Plato has not yet defined αἰών, and by the same token, time. The last two sentences of the above passage are aimed at clarifying this.

Before addressing those lines, however, one last aspect of the metaphysical definition of time should be addressed: namely, the image of αἰών being qualified as 'moving' (κινητόν).[96] Once

[95] "Le découpage habituel de 37d5 ss. fait attribuer le mouvement ordonné selon le nombre au temps, et non au ciel. Une fois privé de son ordre propre, celui-ci ne peut plus apparaître que comme un corps sensible brut, qui devra recevoir son ordre de l'extérieur", Brague 1982, p. 53. "Ainsi, nous avons vu que ce sont les astres en leur mouvement régulier qui sont image. Il est d'ailleurs bien plus naturel, nous semble-t-il, de nommer image le ciel visible plutôt que le temps, inaccessible aux sens", *ibid.*, p. 55.

[96] Plato attributes the ἀκίνητον nature to the intelligible kind only once in the whole account of time: "that which is always unmoving (ἀκινήτως) in its uniformity cannot become either older or younger in the course of time" (38a3-4). Although some translate κινητόν as 'movable', Plato doesn't seem interested in drawing a distinction between actually being in motion and being the sort of thing that is movable – at least not in the *Timaeus*.

more, after the everlasting/begotten pair, ideal and physical features are employed to distinguish between αἰών itself and its replica, time: the κινητόν qualification anticipates the opposition between μένοντος and ἰοῦσαν in the next sentence, where the former defines the static nature of the model's αἰών, and the latter presents the kinetic one characterising the αἰών-ly image.

The 'moving' qualification already foregrounds the peculiarity of time as a cosmic feature. Time is not a feature realised once and for all *via* the demiurgic operations, but a feature articulated in motion *via* the planetary revolutions. Although I will clarify the role of the planets in the creation of time at the end of the section, we can already glimpse why time is best described as a cosmic *phenomenon*. 'Phenomenon', as I observed in the Introduction, highlights that, while time belongs to the physical domain, as an essential component of the created cosmos, it is not itself a physical object, or a feature like its spherical shape.

Like a feature, time is grounded in a physical object, namely the cosmic living being and the planets within it. However, unlike the spherical shape, time is constituted by cosmic motion, both in the succession of its parts and as a whole. It is, therefore, comparable to other physical phenomena of a natural or artificial origin, like a storm or a musical piece. Time, as we will see in the next section, resembles the musical piece more than a storm, insofar as time is also defined in *structural* terms, and that structure requires the Demiurge's artifice as much as the planets' collective effort. Below, I will further discuss time and its definition in two respects: in 2.4.1, I will show how time is a cosmic phenomenon that imitates αἰών, by focusing on the comparative definitions of αἰών and time; in 2.4.2, I will argue that the operation by which the Demiurge creates time is the arrangement of planetary revolutions, so the ἅμα relations between time and the cosmos should be read in that light.

2.4.1. The cosmological definition of time

At 37d5-7, we find the perhaps most discussed passage of Plato's account of time: καὶ διακοσμῶν ἅμα οὐρανὸν ποιεῖ μένοντος αἰῶνος ἐν ἑνὶ κατ᾽ ἀριθμὸν ἰοῦσαν αἰώνιον εἰκόνα. Once more, Brague's remarks on the syntax should be considered before drawing conclusions about the content. In opposition to the traditional reading, which takes οὐρανὸν to be part of the subordinate clause with διακοσμῶν, thus being separated from the second half of the sentence by ἅμα, Brague argues that it would be more natural to read καὶ διακοσμῶν as a subordinate clause separated from ἅμα οὐρανὸν, as the latter would be already part of the main clause. While Brague accepts that οὐρανὸν is still the object of διακοσμῶν ('in ordering it [i.e. the heaven]'), in his reading the heaven is primarily the object of ποιεῖ, instead of αἰώνιον εἰκόνα.

His reconstruction rests partially on the word order that and renders it more in line with the majority of syntactic constructions in the rest of the dialogue and in Plato's work generally.[97] According to Brague's reading, the main sentence can be analysed in a number of ways that result in a similar enough translation: the cosmos is put in order by the Demiurge, and thereby he crafts the cosmos as an αἰών-ly image proceeding according to number.[98] In this reading the two clauses connected by ἅμα are better connected than in the traditional reading, insofar as they revolve around the same object – οὐρανὸν – and not distinct ones – οὐρανὸν and αἰώνιον εἰκόνα. As we have seen above, the problem of the double imitation is solved by taking αἰώνιον εἰκόνα as a description of the cosmos once time has been created as its feature, i.e. the moving image of αἰών. If so, οὐρανὸν is the object of both activities attributed to the Demiurge (ποιεῖ and διακοσμῶν), the two describing the same activity under different respects. The first aspect (διακοσμῶν) clarifies the sort of operation needed for the result to come about, while the second (ποιεῖ), already anticipated by the verb in the previous sentence (ποιῆσαι), foregrounds the result of the operation. So, Taylor's translation of ἅμα ('in the very act of ordering') is far more fitting than Cornford's 'at the same time that he ordered'.[99] In this sub-section I will focus on the resulting αἰών-ly image, while the διακοσμῶν operation will be discussed in relation to the setup of the planetary revolutions in the next sub-section.

Let us now turn to the resulting definition of time as a cosmic phenomenon, which I will refer to as the 'cosmological definition'. Firstly, by following Brague's reading, οὐρανὸν, in the guise of the κατ' ἀριθμὸν ἰοῦσαν αἰώνιον εἰκόνα, is *identified* with time, as it is the most plausible referent of τοῦτον and the *definiens* of time.[100] Note, however, that the identification is only partial, since the αἰών-ly image refers to οὐρανὸν as it instantiates the αἰών-ly feature, i.e. as it proceeds according to number. If so, 'the cosmos as an αἰών-ly image proceeding according to number' is the

[97] Brague 1982, p. 43-46.

[98] "Il serait difficile de comprendre οὐρανὸν ποιεῖ (…) εἰκόνα comme un double accusatif à sens résultatif, au sens de "il fit du ciel une image", car il faudrait l'article devant οὐρανόν, même si celui-ci peut exceptionnellement manquer. On peut aussi supposer qu'un accusatif simple est précisé par une apposition, auquel cas la présomption est forte que le complément soit le ciel, réalité corporelle. Ou bien encore, et c'est la solution que nous préférions, on peut comprendre l'apposition en un sens plus relevé que de simple précision, comme exprimant "un effet ou un résultat provenant de l'action exprimée dans la phrase", ce qui d'ailleurs la rapproche pour le sens du double accusatif. Dans ce dernier cas, l'apposition ne se contente pas de juxtaposer deux termes équivalents; elle indique, en une sorte de phrase spéculative, que le ciel est constitué comme image de l'*âion*" (Brague 1982, p. 46). Although Brague's first and third hypotheses fit best with my reading, I don't see any reason to favour one over the other in virtue of syntactical considerations alone. I take the general aim of the main clause to be a presentation of the αἰών-ly image as the heaven once the creation of time has been accomplished. For a more recent discussion of the syntax of the passage following Brague, see Johns 2014, p. 13.

[99] Taylor 1928, pp. 185-186; Cornford 1937, p. 102. It should be noted that the philosophical upshot of Brague's syntactical hypothesis, does not ultimately depend on syntax. Even if his reconstruction is rejected, the content expressed by the subordinate and main clause connected by ἅμα could be still interpreted in a similar way.

[100] As Brague acknowledges, the referent could be the αἰών-ly image, and τοῦτον is in the masculine form due to attraction from οὐρανὸν (Brague 1982, p. 66).

definition of time. This second version of the definition brings the metaphysical definition and Plato's cosmological conception together, explicitly incorporating the latter into the former and successfully presenting time as a phenomenon built into the cosmos. As such, we should consider this definition, more than the metaphysical one, as the complete definition of time.

Secondly, the definition of time above (κατ' ἀριθμὸν ἰοῦσαν αἰώνιον εἰκόνα) is outlined in a comparison with αἰών itself, defined as μένοντος ἐν ἑνὶ.[101] Hence, while ἰοῦσαν refers to the circular motion of cosmic life, μένοντος describes the static life of the everlasting living being employed as a model. The two terms present the *ontological* component of the definition in terms of physical and ideal features, thus underscoring the difference between αἰών and time. However, in order for there to be an imitation, there needs to be resemblance too, and while time cannot resemble αἰών ontologically, it structurally succeeds in doing so. In fact, the resemblance is mainly underscored by the *structural* components of the definition, ἐν ἑνὶ and κατ' ἀριθμὸν.[102] As we will see in Chapter 6, number and unity bear a resemblance to one another insofar as number, despite being a plurality, is composed of *units*. This analysis of the two definitions is inevitably provisional, as it leaves many aspects unclarified. I will return to discuss the passage in light of the framework of content and structure in Section 4.1, after a thorough examination of the meaning of αἰών in Chapter 3.

Nonetheless, we can already conclude that the above reconstruction of Plato's definition is more plausible than Zeyl and Thein's reconstruction. Although Zeyl and Thein differently characterise what the view entails, they agree that time is eventually identified with ἀριθμὸν rather than with κατ' ἀριθμὸν ἰοῦσαν αἰώνιον εἰκόνα. For instance, in Zeyl's translation the τοῦτον is rendered as "this number, of course, is what we now call 'time'".[103] While the view is syntactically

[101] Proceeding according to number is not one among many features presenting what an αἰών-ly image is, as Cornford seems to read it (Cornford 1937, p. 102). The participle 'κατ' ἀριθμὸν ἰοῦσαν' should be read as an apposition of αἰώνιον εἰκόνα, just as μένοντος ἐν ἑνὶ is for αἰών, so that it has the function of explicating what constitutes an αἰών-ly image. "'Temps' est le nom que donnent les hommes à ce qui, dans le langage des dieux, recevrait le nom de 'ciel-mû-selon-le-nombre'" (Brague 1982, pp. 61-62).

[102] Consider, as a contrast, the *Cratylus* in the way it presents the imitation between the motion of bodies and that of certain letters. The imitation is *physical* and takes place because there is a similarity between the letters and the motion they want to imitate (διὰ τούτου τοῦ γράμματος τὴν φορὰν μιμεῖται, 426d7). For instance letter 'r' is used 'as a tool' to imitate motion because the name-giver saw "that the tongue was most agitated and least at rest in pronouncing this letter (οἶμαι τὴν γλῶτταν ἐν τούτῳ ἥκιστα μένουσαν, μάλιστα δὲ σειομένην, 426e4-5)". The relevant similarity lies in 'being in motion' despite the fact that the motion of the tongue cannot be structurally similar with the ones it represents.

[103] Zeyl 2000, p. 24. Thein argues that "time as number – a mathematical structure – is not identical to this image, but it enables the planets themselves, as living beings whose motions express the appropriate number, to maintain the ordered *regularity* of their motion" (Thein 2015, p. 4-5), whereas Zeyl describes time as "a supervenient aspect of that [i.e. cosmic] motion", Zeyl 2000, p. xlii *fn.* 80. The reading first appears in Brague, who remarks, though, that the hypothesis has a more uncertain status than what he argued for up to that point. He suggests that αἰώνιον could be taken together with ἀριθμὸν, hence having an αἰών-ly number, i.e. time. He argues for this hypothesis following the line of reasoning that brought Cornford to propose an emendation of αἰώνιον (see *fn.* 40): "il fait le ciel, image (…) dont la marche se règle sur un (ou : le) nombre *aïônios*, et c'est bien ce nombre que nous appelons temps. S'il est ainsi, ce qui

tenable, it is not exegetically so, for the following important reason. As seen above, αἰών is defined by two components – the ontological and the structural. Hence, we should expect time, as the cosmic phenomenon corresponding to αἰών, to be likewise defined by both components (κατ' ἀριθμὸν ἰοῦσαν), and not simply identified with ἀριθμὸν. The ontological component of αἰών (μένοντος), as we established, refers to the static life of the everlasting living being αἰών is associated with (ἡ τοῦ ζῴου φύσις οὖσα αἰώνιος). Likewise, time must be defined by the corresponding ontological component in the cosmos, i.e. circular living motion.

This hypothesis is further confirmed by the metaphysical definition of time, where time is defined as moving (κινητόν), and by the later re-statement of the cosmological definition of time, at 38a7-8: "the generated forms of time that imitates αἰών and revolves according to number (χρόνου αἰῶνα μιμουμένου καὶ κατ' ἀριθμὸν κυκλουμένου)". There, the circular motion (κυκλουμένου) characterising cosmic life is explicitly included as part of what defines time, thereby confirming that time, in Plato's definition, is a cosmic phenomenon 'according to number' and not merely the supervenient 'number'.

2.4.2. The ἅμα relations and the role of the planets

The ἅμα relations between time and cosmos first introduced in Section 1.1 can now be interpreted in light of what has been established with the cosmological definition of time. The first ἅμα relation, as I argued above, is between the act of bringing about order (διακοσμῶν) and the result that it yields, i.e. making the cosmos an αἰών-ly image. While I discussed the result in the previous sub-section, the specificity of διακοσμῶν as a demiurgic operation must still be accounted for.

Διακοσμεῖν, although it originally had a military sense of 'marshalling' and 'arraying', is consistently employed in natural philosophy with a more general sense of setting up order and regularity.[104] In Plato's dialogues, the term often captures the establishing of well-ordered arrangements, as for instance in the passage on the cosmological role of *nous* in Anaxagoras (*Phd.* 97c2, 98c1). In particular, two passages compare well with the definitional section in light of the explicitly cosmological context and of their reference to the planets and parts of time. In the *Philebus*, *nous* is responsible for arranging the visible spectacle displayed by the cosmos, the Sun, the Moon, the heavenly bodies and the motion of the whole (πάντα διακοσμεῖν αὐτὰ φάναι καὶ τῆς ὄψεως τοῦ κόσμου καὶ ἡλίου καὶ σελήνης καὶ ἀστέρων καὶ πάσης τῆς περιφορᾶς 28e2-6); similarly, in the *Laws*, at 886a2-5 those heavenly bodies are associated with the articulation of the

est *aïônios* n'est pas l'image (le ciel), qui appartient au domaine de ce qui naît, mais le nombre sur lequel cette image se règle en son mouvement" (Brague 1982, p. 66).

[104] *LSJ s.v.* διακοσμέω.

seasons, months and years (πρῶτον μὲν γῆ καὶ ἥλιος ἄστρα τε καὶ τὰ σύμπαντα, καὶ τὰ τῶν ὡρῶν διακεκοσμημένα καλῶς οὕτως, ἐνιαυτοῖς τε καὶ μησὶν διειλημμένα).[105]

The two passages show that the term is chosen carefully by Plato to present the operation of ordering the cosmos as the arrangement of a multiplicity of heavenly bodies, i.e. the planets. As we have seen in Section 2.2, making the cosmic living being αἰών-ly still reflects the goal to complete *that* living being, despite the fact that its creation involves other living beings, i.e. the planets, as instruments. Now we have further evidence aligning with that conclusion in that the result of the Demiurge's work is the creation of a cosmic phenomenon, and yet this is accomplished by setting up planetary revolutions.

The connection between the ordering of the cosmos and the creation of time that διακοσμεῖν introduces is further specified in the second ἅμα relation, which immediately follows the two definitions discussed above as *prima facie* evidence for the cosmological definition of time (γάρ).[106] The creation of days, nights, months and years collectively referred to as parts of time (μέρη χρόνου, 37e3) are presented by Plato as evidence that his definition of time hits the mark. In fact, before the generation of the cosmos there were no parts of time, but once the Demiurge framed the cosmos, together he also contrived the generation of those parts (τό τε ἅμα ἐκείνῳ συνισταμένῳ τὴν γένεσιν αὐτῶν μηχανᾶται, 37e2-3). The question, once more, is how best to understand ἅμα in the context. The conjunction is between the two activities, framing and contriving, which are bringing about the cosmos and the parts of time respectively. An analogous relation is presented in the third ἅμα relation, at 38c6-7 (Χρόνος δ' οὖν μετ' οὐρανοῦ γέγονεν ἵνα ἅμα γεννηθέντες ἅμα καὶ λυθῶσιν), which, as we have seen in Section 1.1, additionally considers a hypothetical joint destruction.[107]

Given that in sub-section 2.4.1 I presented the relation between time and the cosmos as that of an essential feature to a feature-bearer, the two passages above can be read similarly. They present that same relation in the form of a necessary conjunction (ἅμα). In fact, if, as I argued, time is a proper feature of the cosmos, the generation of a *true* cosmos necessarily entails the generation of time with it. However, as we have seen in Section 2.2, there is an implicit asymmetry in the ἅμα

[105] There are five other instances of διακοσμεῖν in the *Timaeus*: at 24c5, where the goddess is described to set up the social order; at 53a7, where it refers to the setting in order of the universe; at 69c1, where it describes the operation of shaping the four elements and twice at 75d7, where the design of the mouth is under discussion.

[106] Including this small passage (37e1-3) in the definitional section is, I think, consistent with the re-reading I proposed so far. The question about how Plato's account of time should be divided is not trivial, as any choice is guided by one's interpretation. I take the passage to be first evidence provided in favour of the definition of time just put forth, before the start of a new section of the account of time. After the digression on tense (37e3-38b6), the ἅμα relation is restated at 38c6.

[107] As I pointed out in Section 2.2, the heaven is used by Plato as a synonym of the cosmic living being, and I take it that until stage 2 of the cosmogony has begun, it still refer to the cosmic living being *without* other living beings as its parts.

relation: while an incomplete version of the cosmic living being could exist without time, time simply could not, by definition, exist in absence of the cosmos and its living motion. So, the ἅμα relation is symmetric only because it is *teleologically* fixed. Compare it with the same relation in the model: the conjunction between αἰών and the model is fixed *by nature* (ἡ τοῦ ζῴου φύσις ἐτύγχανεν οὖσα αἰώνιος, 37d3), whereas the Demiurge is ultimately responsible for retaining the same conjunction in the cosmos. The Demiurge's goal to make the best possible imitation of the model is what really accounts for the ἅμα relations.

Finally, in my reading, to contrive (μηχανᾶται) the nights and days, months and years just consists in setting up the planets in the cosmos. That operation is spelled out thoroughly from 38c3, in four steps: 1) the creation of the bodies of the planets and their positioning on the circles of the cosmic soul (38c7-e3); 2) making those bodies alive and intelligent, so that they are then instructed by the Demiurge of the task they should carry out (38e3-39a3); 3) the planetary revolutions are *identified* with time, and in particular, Timaeus describes the creation of the parts of time *via* the revolutions of the Sun, Moon and other five planets (39a4-d7); 4) in the concluding recapitulation of Plato's account of time, the planetary revolutions, i.e. the heavenly bodies that have turnings and travel across the heaven (39d7-8), are presented as responsible for the best possible cosmic imitation of the complete and intelligible living being, with respect to its διαιώνια nature (πρὸς τὴν τῆς διαιωνίας μίμησιν φύσεως, 39e1-2).[108] Hence, given the identity Plato postulates between time and the planetary revolutions, the necessary conjunction presented by the ἅμα relation is ultimately a relation between the cosmos and the planetary revolutions set up within it, as we will see in Part III.

To wrap up, the close analysis of the definitional section proposed in this chapter lays out a provisional outline of Plato's cosmological conception of time. Time, in my reading, is conceived as a cosmic phenomenon resembling αἰών that revolves according to number. Moreover, that cosmic phenomenon is identified with the planetary revolutions set up by the Demiurge. However, the analysis proposed has not yet addressed the components of Plato's definition of time in detail, as that will be the goal of Parts II and III of my thesis. In Part II, I will further explore the connection between the cosmos, life, αἰών and time, whereas in Part III, I will focus on the function of the planets and their relation to the κατ' ἀριθμὸν qualification which defines the temporal structure.

[108] For a brief discussion of the significance and hypothetical origin of διαιώνιος, see Section 3.2, p. 63.

PART II – AἸΩΝ AND TEMPORAL LIFE

"Quod igitur interminabilis uitae plenitudinem
totam pariter comprehendit ac possidet,
cui neque futuri quicquam absit nec praeteriti fluxerit,
id aeternum esse"
(Boethius, *De Consolatione Philosophiae* V 6, 8)

The conclusions reached in Part I solicit a more detailed enquiry into the connections Plato draws between the cosmos, life, αἰών and time. The main claim I argued for is that in the definitional section time is defined as a cosmic phenomenon, *constitutive* of the cosmic living being, as one of its proper features. In particular, time and αἰών's definitions state that they are constituted by the living motion of the cosmos and the living stillness of the model respectively. This conclusion already suggests that in Plato's conception there is a close connection between time, αἰών and life. My enquiry in Part II of the thesis aims at providing a better grasp of the complex background to that conception (Chapter 3) in order to look into the details as they are presented in Plato's account of time (Chapter 4).

In Chapter 3 I will first discuss the intelligible living being chosen as a model for the cosmos. My claim is that both the cosmos and its model are living beings defined by completeness, which I read as a term highlighting beauty and plenitude. Completeness, I argue, is important in guiding our understanding of Plato's conception of time and αἰών, as proper features of the two living beings. Plato's conception is further explored by examining the semantic history of αἰών, and, in particular, the semantic shift recognisable in natural philosophy between the 5th and 4th century. I will argue that the traditional notion of αἰών, as a temporally delimited lifespan, comes to be associated with divine and paradigmatic life. In fact, αἰών comes to describe the totality of life that is supra-temporal, as it applies only to living beings which are everlasting and unchangeable, hence with no temporal beginning or end to their life.

In Chapter 4, I will return to Plato's account of time to analyse the comparison between αἰών and time in terms of a structure-content dichotomy. My claim is that, in Plato's conception, αἰών and time are *structured totalities of life*, to be analysed as the compound of content and structure. Whereas the content of time and αἰών differs, because of the different ontological constitution of the cosmos and its model, their structures bear resemblance to one another: while time is structured as a complex and kinetic totality of parts, progressing 'according to number' towards completion,

αἰών consists in a totality without parts, i.e. a complete and undivided unity of life. Finally, I focus on time as a totality of life, to show how both the parts and the whole of time are based on the articulation of the periods of the cosmic soul. In this way, the parts of time, in my reading, are best understood as stages of cosmic life, whereas the complete year is interpreted as a finite cosmic lifespan, endlessly repeating itself.

Ch. 3: Cosmos, lifespan and completeness

To explore the connection Plato draws between time, αἰών, life and the cosmos we first need a brief overview on the central role life plays in the *Timaeus*' cosmogony. Because ζωή is a far wider notion than the one we are familiar with through the lens of contemporary biology, 'living being' (ζῷον) equally applies to gods, humans and animals.[109] As we have seen in Chapter 2, if we take Plato at face value, there are living beings in the intelligible domain too: the model chosen for the creation of the cosmos is an intelligible *living being*, and the Demiurge is presented as a god, at least suggesting that he might also be included among the living beings.[110]

Leaving aside the issue of accounting for the life of *intelligible* living beings, there seems to be a *trait d'union* between all forms of *physical* living beings, and that is the better or worse instantiation of intelligence in the body. In fact, all physical living beings are composed by the 'immortal' part of the soul and a spherical body. The life led by the compound is ultimately a cognitive one, as the exercise of wisdom and intelligence (30b1-6, 37a2-c5). This cognitive life, as we have seen in Section 2.2, consists in the circular motion of the two circles of the soul (the Same and the Different), in harmony with the motion of the body (34a1-5, 34b3-35a1, 36d8-37a2).[111]

While the life of mortal living beings is a far more complex phenomenon, requiring a tripartite soul (69d-71a), the life of physical gods is free from any other task except for those involving its cognitive function, as they do not need organs for their own self-preservation in virtue of their excellency, and quasi-immortality and indissolubility (see sub-section 1.2.2). At the other end of the spectrum we have animals, whose life is flawed, as they cannot function properly *qua* intelligent beings because of the disrupted circles of their souls (91e-92c) and, in an intermediate position, humans, capable of imitating either gods or animals (90a-d).

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[109] See Sattler 2019 for an extensive discussion of the variety of living beings in Plato's *Timaeus.* The case of plants works as an interesting borderline case for Plato's notion of life. Plants are said to be alive by Plato, and thus admittedly among the ζῷα, insofar as the term describes an ensouled body. However, the plants' soul is of the kind corresponding to the inferior part of the mortal living beings' soul, i.e. the appetitive one. Hence, plants lack the intellective and immortal part which the other living beings all share and that makes them capable of self-motion (77a-c). Overall, it seems that for Plato, being composed by that divine part of the soul is a crucial criterion to determine whether one is a *proper* ζῷον (42e6-43b2), hence excluding plants from the category.

[110] It has been argued that the Demiurge does not count as a living being, insofar as it does not seem to have a soul (see Sattler 2019 *fn.* 10). However, in the *Timaeus* the claim that a living being is an intelligent ensouled body likely holds true only for physical living beings. The Demiurge and the model could be examples of ideal, or purely intelligible, living beings, to be compared with Aristotle's divine unmoved movers, as in *Metaphysics,* XII 7 (see Section 3.3 for a brief outline of Aristotle's account).

[111] Plato's notion of life has been labelled as 'embodied intelligence' by Amber Carpenter (see Carpenter 2008 pp. 39-47). I would qualify her claim as 'life in the physical domain is embodied intelligence'. When discussing physical gods, I assume an identity between the purely intelligent *life* and the harmonious *circular motion* their body and soul share. See Sattler 2019, pp. 8-10 for a discussion of the identity between circular motion and intelligent activity.

Moreover, the creation of divine life is the result of a process of ordering, as order is considered intrinsically better than disorder (εἰς τάξιν αὐτὸ ἤγαγεν ἐκ τῆς ἀταξίας, 30a5). Presumably 'τάξις' is here intended in the double connected sense of bringing about a hierarchical organisation in the universe, granted by the rule of intelligence over the body, while also making the universe mathematically structured.[112] The latter sense, as we have seen in sub-section 2.4.1, is crucial for my analysis of time and αἰών in Plato's account, as both are defined by their structure as much as by their connection to the life of a living being – the intelligible living being for αἰών and the cosmos for time. Before returning to the structural aspect of time, in Chapter 4, we will need to clarify the biological components involved in Plato's cosmological definition of time: the cosmic living being (Section 3.1) and αἰών (Sections 3.2 and 3.3).

3.1. On the cosmic living being

I argued in Chapter 2 that time, in Plato's account, is a *cosmic* phenomenon, hence it is essential to the creation of a cosmic living being. The definitional section, however, does not explain why time bears an essential connection with *that* living being in particular.[113] The relation is simply posited, as perhaps a self-evident one, in Plato's assessment. Nonetheless, an attempt should be made at making explicit the relation Plato leaves implicit in order to have a better understanding of his conception of time. With that goal in mind, we need a firmer grasp of what is characteristic of the cosmic living being, in Plato's view. There has been insightful work produced on the topic, and two aspects defining the peculiarity of the cosmos will be the starting point to put forth a more general thesis about its nature.

Firstly, as argued by Sarah Broadie, the cosmic living being is, for all intents and purposes, entirely independent from the intra-cosmic living beings. They are parts just in the sense that they are *in* the cosmos, but they don't play a function in the preservation of the whole, as cells do in an organism. So, whereas the intra-cosmic living beings are not independent from the cosmic living being – as it constitutes their 'environment' – cosmic life continues entirely on its own, without any support needed from within (the planets are 'organs' in a different sense, for which see Section 5.3).[114] What is driving this configuration of life in the physical world, then, is not a concern for the

[112] The arrangement of mathematical structures in the universe is the recurring theme of Plato's cosmogony, as only in that way is the Demiurge's work excellent and most beautiful, becoming a divine living being. See Sub-section 6.1.2 for an overview of some of the passages where the said structures are crafted by the Demiurge.
[113] According to Cornford, all the celestial gods have a temporal life, hence also partaking in αἰών (Cornford 1937, p. 102). In my reading, everything in the cosmos is also in time, in that they always have a determinate temporal 'location'. However, time is not constitutive of what they are as it is for the cosmos.
[114] Broadie 2016, pp. 165-166.

preservation of cosmic life *per se* but rather the Demiurge's intention to make the cosmic living being an all-comprehensive container of living beings, as required by the chosen model (39e3-40a2). Attaining *completeness* in that regard (εἰ μέλλει τέλεος ἱκανῶς εἶναι, 41b7-c2), by not leaving any kind of living being out, even trumps what would be best for individual intra-cosmic living beings: the Demiurge decides to withdraw from creating all the living beings within the cosmos, as they would all be like gods, hence leaving the cosmos deprived of the species of *mortal* living beings.

Secondly, the cosmic living being stands out among living beings for its function as a supreme paradigm of life in the physical domain, as argued in 47a4-c4 and 88c7-89a6. The cosmos has this paradigmatic role for us because, as pointed out by Gábor Betegh, there is a fundamental isomorphism between our heads and the cosmic living being.[115] The cosmos, in fact, leads the finest and most self-sufficient of lives (33d1-34a1, 34b4-9, 36e3-5), hence being a paradigmatic instantiation of cognitive life, as opposed to the flawed version led by humans: while the rotations of the human soul are affected internally and externally by bodily particles, thus leading to a constant distortion of cognition, the cosmos, does not have non-cognitive parts of the soul, nor anything external affecting it.[116]

In my reading, both of the above outstanding aspects characterising the cosmic living being are accounted for by the overarching notion of *completeness* (τέλος). Completeness, in fact, is not predicated of the cosmos in the generic sense in which it does lack anything as a living being, composed of, like any other physical god, an excellent body-soul compound that engages in a single, intelligent activity – i.e. its cognitive life. Rather, completeness seems to ascribe unique features to the cosmos, which makes it stand out among living beings, because of its conjoined *beauty* and *plenitude*. 'Plenitude' here highlights the fact that in every respect, the cosmos does not leave any part out – in terms of living beings within it, as much as the composition of its own body, and, as we will see, life. Beauty, moreover, highlights how that plenitude makes it inherently choiceworthy as a living being.

As mentioned above, the completeness that defines the cosmos is brought about in imitation of the model, and to the model we should turn once more. As seen in Section 2.1, the Demiurge at the beginning of the cosmogony makes a number of choices to select the best possible model for the cosmogony. The first two demiurgic choices are for an everlasting model and, among those of that

[115] The cosmos is taken as the model for making the human head, at 44d3-6, having a soul arranged in the circle of the Same and the Different, at 43d-44a. See Betegh 2018, pp. 125-128 and 133-137, for a recent discussion of that relation.
[116] For the cosmos' freedom from organs and from external disruption (33a-d, 34a). Note that, while the cosmos shares the lack of internal disruption with the other physical gods, it stands out even among them, because its cosmic body is made of *all* the stuff available. Moreover, it also differs from them by not having any other motion other than intelligent rotation around itself (33d3-34a1).

kind, for one that is a living being. However, at 30c2-31a1 the Demiurge makes a third choice between two species of intelligible living beings – the complete and the incomplete, or partial:

> When the maker made our cosmos, what living being did he make it resemble? Let us not stoop to think that it was any of those that have the natural character of a *part*, for nothing that is a likeness of anything *incomplete* (ἀτελεῖ) could ever turn out beautiful. Rather, let us lay it down that the universe resembles more closely than anything else *that living being of which all other living beings are parts,* both individually and by kinds (οὗ δ'ἔστιν τἆλλα ζῷα καθ' ἓν καὶ κατὰ γένη μόρια). For that living being comprehends within itself (ἐν ἑαυτῷ περιλαβὸν ἔχει) all intelligible living beings, just as our cosmos is made up of us and all the other visible creatures. Since the god wanted nothing more than to make the cosmos like the most beautiful of the intelligible things, *complete in every way* (τῷ γὰρ τῶν νοουμένων καλλίστῳ καὶ κατὰ πάντα τελέῳ), he made it a unique visible living being, which has within itself (ἐντὸς ἔχον ἑαυτοῦ) all the living beings whose nature it is to share its kind.[117]

I read the passage in the following way: (1) the intelligible living being is chosen as a model by the Demiurge in virtue of its completeness (30c5, and at 30d2 and 31b1). Hence, I will refer to the chosen model as the *complete intelligible living being* (CILB).[118] (2) Choosing the CILB as a model results in the creation of a beautiful universe as its image (as already stated at 29a1).[119] (3) The completeness of the CILB entails that *all* the other intelligible living beings are its parts, thereby making it *all-comprehensive* with regard to intelligible living beings, and analogously, the image, i.e. the cosmos, will contain all visible living beings, in order to be itself complete and beautiful.[120] (4) A further inference, at 31a1-b4, allows to derive the uniqueness of the cosmos from the all-comprehensiveness of the CILB. The argument is a *reductio* and intends to show how completeness (and hence all-comprehensiveness) necessarily entails uniqueness. Timaeus, then, presents two

[117] Emphasis added.

[118] The model is repeatedly characterised in terms of completeness throughout the dialogue. A few lines later the intelligible living being is again defined as the all-complete living being (τῷ παντελεῖ ζῴῳ, 31b1). Finally, at the very end of the account of time, the model is once more referred to as "the complete and intelligible living being (ᾗ τῷ τελέῳ καὶ νοητῷ ζῴῳ)" (39e1). Special emphasis on the cosmic completeness is given at 41b-c, where it is said by the Demiurge himself that without the other species within it the universe would fall short of completeness, while, once it has them, it would be adequately complete (τέλεος ἱκανῶς). Again, in the concluding summary of the second part of the speech, at 68e, the cosmos is described as the self-sufficient and most complete god (τὸν αὐτάρκη τε καὶ τὸν τελεώτατον θεὸν). Finally, at 92c3-9, completeness appears again in a list of optimal attributes describing the cosmic living being: "A visible living being containing visible ones, perceptible god, image of the intelligible living being, its grandness, goodness, beauty and completeness (τελεώτατος) are unexcelled. Our unique heaven, indeed the only one of its kind, has come to be".

[119] The connection between beauty and well-crafted structure is also posited in the *Philebus* (26b, 51c, 64e, 66b).

[120] 'Περιέχειν' can be translated in a variety of ways and very often it is taken as a 'comprehending' relation, which is the opposite of the 'in' relation. That the two relations are expressing the two sides of one asymmetrical relation seems evident for example in the *Parmenides* (138a-b, 144e-145e) where it is also made evident how 'comprehend' and 'being in' are a pair of *mereological* relations: "'Each of the parts is surely in the whole, and none out of the whole.'— 'Just so.'— 'And are all the parts comprehended in the whole?' — 'Yes'" (145b7-c1). The same mereologically-related use appears in the discussion on place in the *Physics* (207a35-207b1). The relation of comprehension, I hold, is entailed by completeness, without merely being a synonym of it. In fact, not every feature of the cosmos consists in a relation with the other living beings or follows from that relation. Examples of special features that involve plenitude in different respects are the complete body of the cosmos and time itself, as we will see at the end of the section.

special features characterising the CILB – all-comprehensiveness and uniqueness – in order to account for the structural similarity of the cosmos. The cosmos is unique because it is made "like the all-complete living being in respect of uniqueness (κατὰ τὴν μόνωσιν ὅμοιον ᾗ τῷ παντελεῖ ζῴῳ)", and likewise for all-comprehensiveness.

Now, my reading of the CILB takes a stance in a longstanding debate on the exegesis of the passage above. The crux of the discussion is whether the features discussed in the passage are ideal or proper features (see Section 2.1). In fact, in the reading I endorse, first proposed by Richard Parry, the CILB is defined as the paradigm-case of a *species* of living being, as opposed to the incomplete ones.[121] In this reading, completeness, and the entailed features of all-comprehensiveness and uniqueness etc. are *proper* or specific features, defining the CILB as a distinct kind of living being. The opposite position, supported by Mohr and others, takes the CILB as just the *genus* 'living being' and consequently they understand completeness and connected features as *ideal* and thus generic features, defining it *qua* form.[122]

Two separate objections can be moved against the second reconstruction. A first objection follows Richard Patterson's remark, arguing that the all-comprehensiveness and uniqueness of the cosmos are not of the kind that would follow from imitating a genus. It follows, then, that Plato is not thinking of the CILB in those terms. The cosmos, i.e. the image, does not simply need to include within itself all four species, as if the imitation of the CILB simply required all the species to be instantiated.[123] Such a conception would in fact still allow for multiple *cosmoi* to exist, as long as each cosmos has all the four species of living beings within them. Instead, the text presents as a strict prescription for the imitation of the model that the cosmos contains not only all species of living beings, but *all* the individual visible living beings within itself. If so, the relation between the CILB and the other living beings is not like one between genus and species, and reading the CILB as itself a paradigm-case of the species fits the textual evidence more adequately.

[121] In other words, the CILB is not an F-ness of any kind but a paradigmatic representative of F. Following John Malcolm's distinctions regarding the various options concerning the classification of forms, in my reading Plato's account takes forms as non-univocal representatives of F-ness, hence relevantly different from the sensible instances of F in virtue of the different ontological standing (Malcolm 1991, pp. 92-105). For my discussion of the ontological constitution as a difference-maker, see sub-section 2.1.2. For a discussion of the sense in which the CILB is alive, see pp. 74-75.

[122] Parry remarks that "the IWA (the intelligible world animal) is not a genus because it is a Form for a distinct animal, our cosmos. If we think in term of instantiation, we can see the difference. The genus 'animal' is instantiated only in its various species and does not have a separate instantiation distinct from the species" (Parry 1991, p. 26). According to Mohr's interpretation, however, the 'comprehending' and 'comprehended' relations, are just a way of describing hierarchical relations between *genera*: '*x* comprehends *y*' is, in that reading, just a relation among more and less specific *genera*, and is the converse of the relation '*y* partakes in *x* (Mohr 1985, p. 27-33). For other supporters of the 'genus' interpretation, see *fn.* 176.

[123] Patterson 1981, p. 115.

Secondly, if we accept that the relation between the CILB and the other living beings is just a relation between genus and species, we should expect that the Demiurge does not create the cosmic living being in addition to all the other species of living beings. In fact, the genus 'living being' would be already instantiated in all the species, in the same way as in the *Sophist*, at 219c-d, the species of the genus 'acquisition', 'mutual exchange' and 'taking possession' equally instantiate acquisition. Following Keyt's objection, it is not clear why ideal features concerning the relation between the genus and species should come into play in making the universe alive. On the other hand, if, as the supporters of the view hold true, the Demiurge recognises an independent worth in additionally bringing about the genus 'living being' together with its ideal features in the physical world, we could wonder why the same procedure is not followed in all cases of metaphysical imitation in the cosmogony. After all, if those are ideal features, they would define any intelligible model.

It suffices to consider the other notable case of metaphysical imitation described in the *Timaeus* as a term of comparison, i.e. the four elements, to show that in that case the Demiurge does not instantiate the genus in addition to the species: we know there are only four species of elements instantiated in the universe to resemble the same number of forms. Moreover, we know that the total amount of each is unified in one cosmic body (31b-32c), but that body is not itself a fifth element, meant to resemble the genus 'bodily element'.[124] If, as Mohr suggests, making an instantiation of the genus in addition to all the species is choice-worthy for every metaphysical imitation, the Demiurge acts inconsistently on it.[125] It is more plausible, then, that the alternative reading is correct: the CILB is the most choice-worthy model, not only among the intelligible living beings, but, in absolute terms, as the most beautiful and worthy of intelligible things (καταξιώσωμεν, 30c4; τῷ γὰρ τῶν νοουμένων καλλίστῳ, 30d1-2) in virtue of its proper features of outstanding completeness.[126]

To conclude my analysis, I return to where I started the section, to show how the completeness of the CILB is the reason for the making of specific outstanding features in the cosmic living being. Let us consider the three reasons given for having the cosmic body made out of

[124] Karel Thein argues that the CILB, much like the cosmic body, is not a distinct intelligible living being over and above the other species of living beings. Rather, it is simply a way of describing the compound of all the intelligible species of living beings. The decision to make a further, cosmic living being, is not due to the prescription of the model but an independent contrivance of the Demiurge (Thein 2006). His reading, however, is not tenable precisely because Plato, as seen above, presents the model as one chosen *among* intelligible living beings.

[125] The unity of the cosmic body, composed by the four elements, is created through a harmonious proportion, which allows for friendship and bond between the elements (*Ti.* 31b5-32c5).

[126] Brad Berman in his reading opposes the completeness of the CILB and its choice-worthiness in an unwarranted way (Berman 2016, p. 171). Completeness, as it emerges from Plato's considerations, is inherently choice-worthy, as it is intended as plenitude tied with beauty, just as beauty is tied with goodness (87c4-5). The universe is made like the CILB because it is the best possible model, so the goal of making the universe the best possible cannot diverge from bringing about that metaphysical imitation.

the whole amount of the four elemental bodies as a case in point. The first reason is that "*as a living being* it should be as whole and complete as possible (ἵνα ὅλον ὅτι μάλιστα ζῷον τέλεον) and made up of complete parts" (32d1-2). Of course, as the cosmic living being is composed of a body and a soul, they both must be complete, hence prescribing the use of the whole amount for each of the bodily elements available. The second reason appeals to the all-comprehensiveness of living beings that follows from completeness, which requires that there is no available body outside. This reason is distinct from the first, despite leading to the same result. In fact, in this case, any 'material' left out of the cosmic body is here considered as a potential body for a living being existing outside the cosmos, so that the cosmos would not be any longer comprehensive of all the other physical living beings, as the CILB.

Finally, the third reason concerns the preservation of a single cosmos from external threats, which once more leads to the result of not leaving anything external to the cosmic body (33a4-b1). The third reason is usually put in contrast with the first two, as it is taken to be a teleological consideration independent from the imitation of the CILB.[127] However, it does not have to be the case: the goal which the reasoning is aiming for, I argue, is the uniqueness of the cosmos. Uniqueness, in the physical domain, requires not only that there is just one cosmos at the moment of creation, but also that it will be the only one ever created, by making it impossible for its body to be damaged by external bodies. That is, after all, what has been inferred from the model earlier on ("our universe came to be the one and only of its kind, is so now and will continue to be so in the future", 31b2-3).[128]

The completeness of the CILB later dictates the shape of the cosmos and, as a consequence of the reasons listed above, its unique kind of motion, i.e. a rotation around itself that is entirely free from wandering. [129] Clearly, then, its completeness has also the result of making the cosmos an exemplary living being, explaining its paradigmatic role for human beings seen at the beginning of the section. The further claim I put forth, in line with this reading and with the conclusions drawn in Section 2.3, is that the αἰών-ly nature attributed to the CILB in the definitional section (37d3)

[127] Conford, for instance, takes it to be an ad hoc response to previous philosophers that argued that, if the cosmos were unique, it would have been threatened by outside bodily elements (Cornford 1937, pp. 52-53).

[128] Berman points out that the model is not mentioned in the passage, so the reasons are not necessarily driven by imitation of the model (Berman 2016, pp. 169-170). However, the three reasons clearly mirror the three features inferred before, as completeness, all-comprehensiveness and uniqueness. Moreover, Berman's reading of completeness aims to render the possession of a complete body conceptually reducible to having a body that is well-balanced in terms of its constituents. In this way, his reading would explain away completeness as means to the end of preserving that unified body (Berman 2016, pp. 176-178). However, the two aspects of the creation of the cosmic body are separately discussed in the text (31b-32c; 32c-33a), showing that they are independent from one another: establishing a proportion of the sort Plato describes must be possible even when not all the material stuff is involved, just as a body can be unified while not being the body suitable for the image of the CILB.

[129] Although its shape would be spherical regardless, *qua* living being, it is significant that it is also introduced as a complete *and* excellent shape (33b1-4).

should be considered one of the outstanding structural features that fall under the qualification 'complete'. If that were the case, we would have an explanation at hand for why time is an essential feature specific to the *cosmic* living being.

A first hint supporting this reading is the adverb παντελῶς (37d4), that draws a distinction between the αἰών-ly nature of the CILB (also τῷ παντελεῖ ζῴῳ at 31b1) and the flawed αἰών-ly image that the cosmos becomes. It would seem that the deficiency of time in comparison with αἰών is a matter of completeness (and lack thereof). To further interpret αἰών as a feature stemming from the outstanding completeness of the CILB, however, we first need to address the meaning and role played by αἰών in the definitional section. In fact, we established in Section 2.3 that 'eternity' is an inadequate translation, since αἰών is presented as a *proper* feature of the CILB, there referred to as an everlasting living being. In the remainder of the chapter, a more general enquiry into the meaning of αἰών will give substance to the connection with life and completeness the term bears in Plato's *Timaeus*.

3.2. Αἰών as lifespan

The main claim I intend to propose in this section is that, throughout its semantic history, αἰών can be interpreted as a term expressing a particular connotation of the word 'life'. In particular, I will argue that the peculiarity of αἰών lies in the fact that it presents life as a *totality*, traditionally delimited by birth and death, translatable as 'lifespan' or 'lifetime'. That notion of life can thus be distinguished from βίος and ζωή that are more often used for the activities one engages in in one's life, or the very condition of being alive, as opposed to being dead. What changes in the course of αἰών's semantic history is its increasingly paradigmatic function to describe a supra-temporal totality of life, which is only available to immortal and everlasting living beings. This new meaning of αἰών, I surmise, also informs Plato's use of the term in the account of time. This reading has been previously defended systematically by Heleen M. Keizer, whose work I mainly follow in my analysis.[130]

[130] "We have seen that lexicons agree in giving 'life' as the first meaning of *aiōn*: the life of a human. But Greek also has the words *zōē* and *bios* to designate life. Briefly put, the word *zōē* refers to the state of being alive (not yet in Homer), and *bios* to the ways and means of maintaining this state" (Keizer 1999, p.16). All scholars agree on the traditional meaning of αἰών as lifespan or lifetime (Degani 2001, pp. 15-19; Festugière 1971, pp. 254-255; Keizer 1999, p.1-2; Ramelli – Kostan 2007, p. 5). However, Festugière and Degani also argue that the word detaches significantly from that meaning in later iterations and especially in Plato's work, so that it can take the meaning of 'eternity'. Not so Keizer, who highlights a continuity in the core semantics of the term, following and expanding on the insights from Brague and Böhme (Degani 2001; Festugière 1971; Keizer 1999; Brague 1982; Böhme 1974). I will use 'lifespan' because the compound word does not already hint to time rendering not trivial the connection αἰών bears with time.

The traditional meaning of αἰών is already found in Homer, where it alternates with a more general sense of 'life' or 'life force'.[131] In particular, αἰών is used in both the *Iliad* and *Odyssey* to refer to the life-force of mortals, thus naturally departing from them in the moment of death. It is said that the αἰών abandons Sarpedon, as later Odysseus expresses the desire to reach his homeland before he dies, namely before losing αἰών.[132] Αἰών, in this sense, refers to life as a condition which can be either possessed or lost, close to the predominant use of ζωή in later Greek literature. However, there is a second way of referring to αἰών, already found in Homer, that more explicitly describes αἰών as the whole span of one's life, delimited by its birth and death. In this latter understanding one would not lose αἰών in death, but rather come to the completion, or end, of their whole lot of life.[133] The latter conception, more than the former, is the one that is later predominantly employed in the history of the term and thus I will refer to it as the traditional meaning of αἰών, although this is not meant to suggest that the first use completely disappears in later authors.

Life, in the traditional sense of αἰών, is conceived as a totality. Consequently, already in archaic literature and up to Plato's times, mereological and quantitative terminology is often employed to qualify αἰών, as well as value-judgements.[134] The attribution of a finite magnitude (either long or short) to αἰών persists from Homer to the tragedians like Euripides, and to later authors, like Xenophon (E. *Med.* 429-430; X. *Ages.* 10, 4; 11, 15).[135] Plato himself uses the term in the traditional sense in various dialogues, although never in the *Timaeus*, and usually in passages with a high and poetic register. For example, in the *Laws*, it is used to describe the lifespan of the titans: they are said to "reproduce the character of the ancient Titans of the story, and thanks to getting into the same position as the Titans did, they live a wretched lifespan (χαλεπὸν αἰῶνα) of endless misery" (III 701c3-4).[136]

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[131] Degani observes that in Homer a durational (as in 'lifespan') and non-durational (as in 'life-force') use of αἰών is equally present, and that we should not assume that the two appear as successive historical stages of the term's semantics. "La 'forza vitale' non si rivelava, all'esperienza, che nella sua 'durata' – e l'una e l'altra erano la stessa cosa" (Degani 2001, p. 18). *LSJ s.v.* αἰών.

[132] *Il.* V 685-6, *Od.* VII 224-5

[133] Examples of this use of αἰών can be found at *Il.* IV 478-9 and IX 415-6 where respectively a short αἰών is attributed and a long one is predicted.

[134] Αἰών can be tearless, enjoyable or treacherous, in Pindar (*O.* II, 66-69; *I.* VIII, 14).

[135] An interesting fragment from the pseudo-Hesiodic Melampodia displays all the three terms for life at once without redundancy, showing that αἰών, despite being a life-related term, plays out a distinct function from the other two, being connected with the magnitude of life, as a totality: "you, who ordained me to have a long lifespan of life (μακρόν αἰῶνα βίοιο) and to live (ζώειν) for seven generations of men" (Hes. Fr. 276, 1s. M. – W).

[136] Plato's use of the traditional sense of αἰών is mostly connected with a poetic nuance intended in the speech, or directly as a quotation of famous poets (Keizer 1999, p. 41). Other cases are in the *Gorgias*, where it is used in describing the lifespan of a skilled and experienced person, as opposed to an inexperienced one (448c6), and in the *Protagoras*, where he is quoting the verses of Simonides (345c7). Finally, in the *Republic* we find it in a colourful expression, describing the afterlife for the whole time as μέθην αἰώνιον, 'life-long drunkenness' (363d2).

Now that the traditional meaning of αἰών has been outlined, we can briefly look at the relation it bears with time. A paramount example of this close connection is the poetic depiction of Αἰών as son of Χρόνος in Euripides' *Heraclidae*. The passage is telling as it presents the subordinate hierarchical position that αἰών has, in relation to time, opposite to the one we have seen in Plato's definitional section.[137] Herodotus illustrates this relation more clearly, as he articulates the Solonian doctrine of the ten ages that sets a limit on the human lifespan. As he presents it, the lifespan is not individual, but collective – measured in a fixed number of days, nights, months and years.[138]

The passage employs αἰών, as much as ζωή and βίος, to refer to the life measured in temporal terms: "In a long span of time (ἐν γὰρ τῷ μακρῷ χρόνῳ) it is possible to see many things that you do not want to, and to suffer them, too. I set the boundary of a man's life (οὖρον τῆς ζόης ἀνθρώπῳ) at seventy years. These seventy years have twenty-five thousand, two hundred days, leaving out the intercalary month […]. To me you seem to be very rich and to be king of many people, but I cannot answer your question before I learn that you ended your life well (τελευτήσαντα καλῶς τὸν αἰῶνα). The very rich man is not more fortunate than the man who has only his daily needs, unless he chances to end his life with all well (πάντα καλὰ ἔχοντα εὖ τελευτῆσαὶ τὸν βίον)".[139] Time, as a sum of years, months and days, measures the magnitude of a lifespan, and thus the date of its coming to an end, or completion (τελευτάω). Αἰών is here described as being *measured* by a certain amount of time.

Interestingly, Aristotle's definition of the traditional meaning of αἰών lays out a connection with time similar to the one outlined by Herodotus: "that name [i.e. αἰών] has been divinely uttered by the ancients. For the completeness which comprehends the time of everyone's life (τὸ γὰρ τέλος τὸ περιέχον τὸν τῆς ἑκάστου ζωῆς χρόνον), that cannot be exceeded according to nature, has been named each one's αἰών".[140] In Aristotle, just as in Herodotus, we find that αἰών is connected with ζωή and χρόνος. Aristotle, however, introduces a new term – τέλος, completeness –in connecting αἰών with time and life. As we have seen, αἰών puts an emphasis on the structural aspect of life, as a

[137] E. *Hclid.* 898-900.

[138] Already in one of Solon's fragments on the doctrine of the ten ages we can find terminology involving measure and completion, albeit with no direct reference to αἰών and time: "if one by completing the tenth attains the measure (τελέσας κατὰ μέτρον ἵκοιτο) […]" (Sol. 27 *v.* 17 W.).

[139] Hdt. 1, 32, 2-5. As Keizer remarks, the life-terms are not used indifferently in the wider context of Herodotus' work, in which βίος finds its particular use with reference to the 'means of life' (Keizer 1999, p. 13). In Sophocles' *Trachiniae* the same point is made again and rendered uniquely with αἰών: "there is an ancient saying among men, once revealed to them, that you cannot know fully well a mortal's men αἰών before one is dead, neither whether he has a good nor whether he has a bad one" (*Trach.* 1-3). Aristotle, around a century later, is discussing again the same Solonian puzzle, but his formulation of the complete lifespan does not involve αἰών, preferring βίος appropriately qualified: "having a complete span of life (λαβοῦσα μῆκος βίου τέλειον)" (*EN* X, 1177b25), and also at I, 1100a5 (βίου τελείου), and again at I, 1101a16, where there is a comparison between time, as a partial measure, and the complete life (μὴ τὸν τυχόντα χρόνον ἀλλὰ τέλειον βίον). This interchangeability shows the semantic closeness between the two and how the τέλειος qualification is crucial for paraphrasing αἰών, just as τέλος is crucial for Aristotle's definition of αἰών.

[140] Arist. *Cael.* I, 279a23-24.

totality of life. Completeness, then, is fittingly employed in defining the term, especially since for Aristotle wholeness and completeness are almost synonyms, as they both present an item in mereological terms.[141] In this way, Aristotle argues that αἰών is a form of completeness, delimited by the amount of time one's life lasts for, or, as I put it, a temporally delimited totality of life.

From what I argued so far, it is clear that my reading resists the interpretation of Aristotle's definition and, more generally, of the traditional use of αἰών as a temporal notion.[142] In my reading, rather, αἰών captures from the very beginning life as a totality, that is in mereological terms. So, while αἰών is thought as having a certain magnitude, measured in temporal terms, it also retains its qualitative aspect as a life-term that grounds it as a form of completeness: the temporal measurement corresponds to a totality *of life*, defined by the beginning and end of the living being's existence.[143] In my reading, however, time remains the fundamental term by which to define αἰών, as time both measures and encompasses the traditional αἰών. The relation between αἰών and time will persist, although turned upside down, with the semantic shift that αἰών undergoes in natural philosophy, as we will see in the next section.

Before analysing the shifted meaning of αἰών, I will briefly linger on the fixed expressions δι' αἰῶνος and πάντα τὸν αἰῶνα (and its variations), since they seem to stretch the traditional meaning of αἰών in a significant way, which might be the origin of the more systematic semantic shift taking place in natural philosophy. For instance, the rhetorician Isocrates – contemporary of Plato – repeatedly uses the formulation τὸν σύμπαντα αἰῶνα as well as ἅπαντα τὸν αἰῶνα and πάντα τὸν αἰῶνα to express a totality that clearly does not amount to a merely human lifespan, but to one of unfathomable length.[144]

This extended use of αἰών does not show that the term develops a separate, abstractly temporal meaning that is detached from the traditional meaning of 'lifespan'. I agree with Keizer that such fixed expressions show a hyperbolic re-elaboration of the traditional semantics of αἰών, so that it captures an amount of time of indefinite or even limitless length.[145] It is plausible to assume

[141] "'Complete' means: That outside which it is impossible to find even a single one of its parts; e.g., the complete time of each thing is that outside which it is impossible to find any time which is a part of it" (*Metaph.* V, 1021b13-14). "Anything which has no parts beyond itself, however, is complete and whole […] ('Whole' and 'complete' are either utterly identical or very similar in nature)" (*Ph.* III, 6 207a8-9).
[142] Degani 2001, p. 28-29.
[143] I am here using Keizer's distinction, which will become clearer when I will discuss the divine αἰών in Section 3.3: "Time is quantitative, the aspect with which the infinite motion of the outermost heaven presents itself as measurable and countable to the soul; aiōn is qualitative, and the total and perfect form (telos) of the durational extent of the outermost heaven" (Keizer 2016, p. 151). Admittedly, there is a derivative use of αἰών in the plural form that employs αἰών as a temporal unit, found for example in Empedocles and Aeschylus. Αἰών stands here as a generic unit of measurement, close to the temporal use of 'generation' (γενεά). For example, Empedocles states that the man of exceptional knowledge "easily saw each of the all things which are in ten or twenty αἰῶνες (ἀνθρώπων αἰώνεσσιν)" (DK 129B, 5-6). See also *fn.* 135.
[144] Isoc. *Paneg.* 28, 46; *De Pace* 34.
[145] Keizer 1999, p. 39-40.

that the traditional term lends itself to not simply indicate a lifespan of length commensurate to human standards, but a temporal stretch beyond human conceivability, that captures a more universal totality, in the same way the English language allows an idiomatic meaning of the fixed expression 'for life' as 'forever'. The emphasis on αἰών as a totality of sort (πάντα) shows an important continuity in meaning with the traditional notion referring to a *complete* lifespan. However, a clear distinction between the hyperbolic use of αἰών and the infinity of time will only be laid out explicitly from Plato onwards, as we will see in Section 3.3 and 4.1. Notably, Plato uses the phrase 'for all αἰών' (πάντα τὸν αἰῶνα, 38c1-2) in his account of time to characterise the tenseless life of the CILB, highlighting that it is mirrored by and yet profoundly differs from 'for all time', predicated of the cosmos (τὸν ἅπαντα χρόνον, 38c2, and beforehand, τὸν σύμπαντα χρόνον, 36e5).

As for δι' αἰῶνος – throughout a lifetime – the expression appears several times in Aeschylus' tragedies, in Empedocles' philosophical poetry and, later, in Xenophon's prose, proving to be widely employed regardless of the literary genres. In this formulation, αἰών refers to someone's lifespan (e.g. in Sophocles, *Elect.* 1024) just as easily as to an endless (temporal) totality (e.g. in Aeschylus, *Suppl.* 574-582) and its emphasis, once more, is on the whole ('throughout').[146] Although this formulation does not appear directly in Plato's account, an intriguing, albeit inevitably speculative hypothesis proposed by Keizer is that the apparent neologism διαιώνιος, used twice in Plato's account, is a contracted version of the above-mentioned expression, presumably employed to emphasise the paradigmatic character of the αἰών-ly nature of the model, as opposed to the αἰών-ly image.[147]

3.3. The semantic shift and the divine αἰών

Given my reading of αἰών, an explanation is needed of why Plato is attributing an αἰών-ly nature to the CILB, presented in the definitional section as an *everlasting* living being and contrasted with the begotten nature of the cosmos (see Section 2.3). As it is generally acknowledged, there is a special use of αἰών among natural philosophers, that leads to a significant shift in the semantics of αἰών, such that it does not correspond any longer to the traditional notion of a lifespan delimited by birth and death.[148] However, I claim, following Keizer, that the shift can be accounted for as a special use that retains the core meaning of 'lifespan', insofar as it captures life as a totality.

[146] DK 31B110, 3; X. *Cyr.* 2, 1, 19; *Ages.* 10, 4; 11, 5. The only occurrence of αἰών in Thucydides is at I 70, 8.
[147] Keizer 1999, p. 71.
[148] Festugiére 1971, p. 258, Keizer 1999, pp. 3-5, Ramelli-Konstan 2007, p. 6, *fn.* 4.

What changes is that, by using αἰών primarily for a paradigmatic and divine sort of lifespan that has no birth or death, philosophers envisage the traditional meaning of αἰών as describing a deficient totality of life, by comparison. The semantic shift is most clearly highlighted by the hierarchical inversion in the relationship between αἰών and time: in fact, the traditional αἰών is a totality only in a qualified sense, insofar as it is temporally delimited, whereas the divine αἰών is a *supratemporal* totality of life. I will show how this reading can be applied consistently to occurrences of αἰών in Empedocles, Plato (besides the *Timaeus*) and, most importantly, Aristotle.

A) Empedocles

Empedocles mainly employs αἰών in the traditional sense.[149] However, there are two passages in which a shift is noticeable in both the scope of application and meaning of αἰών. The first passage (DK 31B26, 10-13) compares the divine condition of existence and that of mortal living beings, highlighting how the latter's αἰών is deficient, whereas the second passage (DK 31B16) refers to cosmic and divine powers, describing their alternate activity as taking place throughout αἰών. The attribution of αἰών to physical gods, which Plato considers only possible in a qualified sense, does not make Plato's use of αἰών incompatible with Empedocles'. Their disagreement is driven by a different understanding of the ontological constitution of physical gods: for Empedocles at least certain physical gods are forever in existence, whereas in Plato they are created and their sempiternity relies on the good will of the Demiurge.[150]

The first passage contrasts the mortal and divine aspect of the intermingling of the four elements: "Insofar as they are wont to grow into one out of many, and again divided become more than one, so far they come into being and their αἰών is not stable (γίγνονταί τε καὶ οὔ σφισιν ἔμπεδος αἰών); but in so far as they never cease changing continually, so far are they evermore, immovable in the cycle (αἰὲν ἔασιν ἀκίνητοι κατὰ κύκλον)". The implicit subject of the sentence are the four elements, and they are looked at in two different ways, in accordance with what it has been said in the previous lines of the poem about mixing and dissolving many from one and *vice versa*. In the first half of the sentence, the elements are considered inasmuch as they compose

[149] See *fn.* 143, 146.

[150] The fundamental cosmic constituents retain the names of traditional divinities, like Zeus, Hera, Aidoneus and Nestis (DK 31B6). As Sedley points out, their naturalistic explanation of the world is not detachable from divine entities, and thus there is no reason why we should not take Empedocles seriously when he is using a theological lexicon to account for the fundamental components of the world (Sedley 2007, pp. 1-8). Another example of Empedocles' understanding of the divine can be found at DK 31B115 where an ancient and everlasting decree of the gods (θεῶν ψήφισμα παλαιόν, ἀίδιον) sets the rules of reincarnations of mortal beings. However, at least *some* physical gods, will being qualified as 'immortal', are not existing forever (see Long 2017 for an extensive discussion).

corporeal mixtures that live mortal lives.[151] In the second half of the sentence the same elements are thought of as those persisting in the endless cycle of mixing and separating out that produces and destroys mortal life.

Αἰών, despite retaining its traditional meaning of a temporally delimited lifespan of mixtures, e.g. men and all the other mortal creatures, is qualified in a way that emphasises its deficiency, as not stable or continual (ἔμπεδος). In order to have a grasp on the reasons for this remark we should focus, as Festugière suggests, on the contrast articulated in the passage between the ontological status 'generated' leading to 'without stable αἰών' and 'changeless' or 'without motion', which is associated with 'always being'.[152] The text might be suggesting, by means of poetic homophony, that, the elemental gods, insofar as they are always changeless in the cycle of various generations of mortal beings, do have a 'proper' αἰών, i.e. αἰὲν ἔασιν. Aristotle is perhaps thinking of this passage when he argues in *De Caelo* that the etymology of αἰών is 'always-being' (ἀεί εἶναι).[153]

An interesting upshot comes from this reading, as it anticipates Plato's and Aristotle's treatment of αἰών: 'always being changeless' seems the adequate condition to have one's life referred to as a proper αἰών, and *vice versa*, while 'being generated' is the condition that makes one's αἰών deficient. A first, notable feature of the semantic shift, then, is that the attribution of αἰών hinges on ontological grounds, namely whether the living being is of the kind that undergoes generation (and consequent destruction) or, on the contrary, it continues forever. As we have seen already in Section 2.3, the definitional section showcases a passage where the begotten nature of the cosmos is the reason for its inability to be completely αἰών-ly, contrasted with the model, that is αἰών-ly in virtue of being an everlasting living being. The same claim appears in Aristotle, as we will see below.

The second passage shows that in Empedocles αἰών is connected with a cosmic lifespan, perhaps anticipating Plato's description of the cosmos as an αἰών-ly image. The passage focuses on Love and Strife, the two divine powers responsible for the successive zoogonies endlessly taking place in the cosmos: "For they are, as they were before and will be, nor do I think that an unspeakably great αἰών will ever be empty of these two". A plausible conjecture supported by both Festugière and Degani takes αἰών to be the lifespan of the cosmos, as within it takes place the endless alternation of the rule of Love and Strife. In fact, the two are invoked to explain not only micro-processes, but the very arrangement of the cosmos, most notably when under the power of

[151] Ibid. *vv.* 5-6.
[152] Festugière 1971, p. 256.
[153] Arist. *Cael.* I 279a27.

Love it becomes the *sphairos*.[154] The qualification of the cosmic αἰών, unlike the unstable one in the previous passage, is ἄσπετος, unspeakably great, which can either describe an endless αἰών, or one of great length that is endlessly repeated, along with the alternation of divine powers.[155]

B) Plato

Besides the *Timaeus*, in Plato there is only one occurrence of αἰώνιος that falls under the shifted meaning of αἰών. The term appears in the *Laws*, book X, when the Athenian guest discusses metempsychosis as a cosmic process of putting together and separating out body and soul, in a clear parallel with Empedocles' doctrine of mortal living beings as mixtures of unperishable elements.[156] The passage describes the divine activity of arranging mortal souls in successive lives, and their proper allocation at each new generation: "our king saw that all actions involve soul, and there is much virtue in them, but also much vice, and that, having come to be, soul and body are indestructible but not αἰών-ly, like the gods that exist according to the law (ἀνώλεθρον δὲ ὂν γενόμενον, ἀλλ᾽ οὐκ αἰώνιον, ψυχὴν καὶ σῶμα, καθάπερ οἱ κατὰ νόμον ὄντες θεοί) – for there would never have been coming into being of living beings if either of these two had been destroyed".[157]

If we look at the above passage bearing in mind Empedocles' comparison between mortal and divine beings with regard to αἰών, we can adjudicate which is the most promising reading of the ambiguous reference of καθάπερ. The possible readings are the following: 1) the gods are indestructible but not αἰών-ly, just like the soul and the body of men, or 2) the gods, unlike their counterpart, are indestructible *and* αἰών-ly. I take that the second reading is the most promising one, since gods must be introduced in contrast with mortal living beings, whose components are indeed indestructible and yet live several lives together while being periodically separated in between. Because of the periodical separation they are not αἰών-ly.[158]

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[154] As pointed out by Festugière and Degani, the *sphairos* is considered a god, and therefore it could be its lifespan under the two divine powers that is considered here (Festugière 1971, pp. 258-59, Degani 2001, p. 32). While it cannot be denied that αἰών is used in the passage to capture a definite or indefinite time-measure, we should also ask why Empedocles uses αἰών instead of χρόνος. After all, the latter is preferred on other occasions to describe the endless succession of cosmic cycles between elements (31B17 *v.* 38, 31B30 *v.* 6). A viable alternative reading is that the unspeakably great αἰών could still correspond to a temporally finite span of life, although unfathomable. In particular, the totality that is discussed could be the cosmic lifespan that ends when the elements are completely unified, under the rule of Love, and the cosmos becomes a s*phairos*, or when it is again dissolved in the various elements by Strife.

[155] For the cosmic connection of ἄσπετος, see *Il.* 8.558 (*LSJ s.v.* ἄσπετος).

[156] In Plato's remark, just as in Empedocles', the components persist throughout every new mixture without being destroyed (see DK 31B17, 26-35). Moreover, already in the immediately prior attempt to give an explanation of the process of metempsychosis, the Athenian guest proposes an account that closely resembles the one-to-many and many-to-one processes that take place between the elements in Empedocles.

[157] *Lg.* X, 903d3-904b1.

[158] For a wider discussion of the exegetical issues raised by the passage, see Keizer and Mayhew (Keizer 1999, p. 63-64; Mayhew 2008, pp. 173-184).

Once more, at the core of the passage is the criterion of generation, or lack thereof: successive lives, in which the body and soul persist through several births and deaths, ward off the αἰών-ly qualification, despite the indestructibility of the components. The interruption provoked by birth and death denies to mortal living beings the αἰών-ly qualification. Αἰών, in its new meaning, only applies to divine life, as the traditionally everlasting one, hence taken to be without generation or destruction. I will refer in the remainder of the chapter to the shifted notion of αἰών as 'divine αἰών'.

C) Aristotle

Aristotle is chronologically the closest philosopher to Plato who explicitly defines αἰών in *De Caelo,* both in the traditional and divine sense, moreover consistently using the term in the latter sense in other works. As such, Aristotle's work provides crucial insight into the new meaning of αἰών, which makes it a crucial term of comparison for Plato's treatment of αἰών in the *Timaeus*. In *De Partibus Animalium,* Aristotle distinguishes between two sorts of living beings: "some are ungenerated and imperishable for all αἰών (ἀγενήτους καὶ ἀφθάρτους εἶναι τὸν ἅπαντα αἰῶνα), but others partake in generation and perishing. The former are excellent beyond compare and divine, but less accessible to knowledge".[159] The fixed expression 'for all αἰών', already discussed in Section 3.2, is employed by Aristotle to draw a distinction between fundamentally different forms of life: the divine and mortal one.

The former sort of living beings is not the focus in that work but is discussed in *Metaphysics* and *De Caelo*. In *Metaphysics,* book XII (1072b25), Aristotle discusses the case of the unmoved mover – a god – that is said to always (ἀεί) be in an optimal and blessed condition, as opposed to us, who are in that condition occasionally (ποτέ). Furthermore, he clarifies that this optimal condition consists in a purely intellectual activity, and that such an activity is life (ζωὴ, b26). To conclude the discussion of the topic, Aristotle adds that the god is an excellent and everlasting living being (ζῷον ἀΐδιον ἄριστον), and the direct consequence of this is that the god has "life and αἰὼν that are continuous and everlasting (ὥστε ζωὴ καὶ αἰὼν συνεχὴς καὶ ἀΐδιος ὑπάρχει τῷ θεῷ)".[160] 'Ζωὴ καὶ αἰὼν' is a hendiadys, and αἰὼν an additional way of presenting the life of that god that is not captured by ζωὴ alone.

Although nothing conclusive concerning the divine αἰὼν can be inferred from the passage, the connection the term bears with divine life is confirmed, and in particular with its *everlasting* qualification (ἀίδιον), also mentioned in Plato's definitional section. This passage, together with the

[159] *PA* I, 5 644b22-24.
[160] *Metaph.* XII, 7 1072b28-30. See also 1073b-c.

one above, shows the other side of the 'generation condition' previously discussed. While in Plato and Empedocles' passages we have seen that generation either wards off the αἰών-ly qualification from a living being or it entails that their αἰών is deficient, in Aristotle we find the contrapositive claim: only an everlasting, and hence ungenerated and imperishable life can be truly described as αἰών.[161]

To gain further insight into how to conceive of a divine and everlasting αἰών, however, *De Caelo* I, 9 279a16-b3 is the crucial passage to examine. We already touched upon the passage in discussing Aristotle's definition of the traditional meaning of αἰών, in Section 3.2. Aristotle, however, introduces that definition only to account for the shifted meaning of αἰών he is employing throughout the passage and beyond. I divide the passage in three parts: (a) from 279a16 onwards, Aristotle introduces αἰών into the discussion by referring to what is outside the heaven. 'Those-over-there' do not belong in the physical world, as "they continue for their whole αἰών (τὸν ἅπαντα αἰῶνα) unalterable and unaffected, living the best and most self-sufficient of lives". (b) At a22 the focus turns to αἰών, first in the traditional definition discussed in Section 3.2, whose meaning is then extended in a second definition of the αἰών of the whole heaven. (c) Finally, at a28, either what is outside the heaven or the heaven itself is portrayed as the divine thing from which life and being within the heaven derive – outlining a relation of dependence between the traditional and the divine αἰών.

The understanding of the divine αἰών outlined so far is confirmed by section (a): "Therefore, those-over-there, are not such as to be in place (Διόπερ οὔτ' ἐν τόπῳ τἀκεῖ πέφυκεν), nor does time cause them to age; nor is there any change in any of the things which lie beyond the outermost motion (τῶν ὑπὲρ τὴν ἐξωτάτω τεταγμένων φοράν)". Such things are said to have the most self-sufficient life in their inalterability (ἀλλ' ἀναλλοίωτα καὶ ἀπαθῆ τὴν ἀρίστην ἔχοντα ζωὴν καὶ τὴν αὐταρκεστάτην), and to continue for all αἰών (διατελεῖ τὸν ἅπαντα αἰῶνα) – adopting once more the expression also employed in *De Partibus Animalium*.[162] Notably, this sort of divine life is possible

[161] Keizer remarks that Aristotle is at ease in attributing a 'temporal' qualification to a transcendent god, such as ἀίδιος, since he also repeatedly applies the term to physical entities, like motion, time and the heaven (Keizer 2016, p. 139). However, as far as I can see, nothing indicates that 'everlasting' is used as a 'temporal' term by Aristotle, if time, just as other things, is considered everlasting. As we have seen already in Section 2.1 and 2.3, Plato consistently uses ἀίδιος as the contradictory feature of 'come to be' and 'begotten' and Aristotle seemingly employs the term in the same way, by applying to the motion of the heaven and to the unmoved movers despite the fact that their relation with time is different (for which see below). Admittedly, Aristotle also uses 'imperishable' (ἄφθαρτον) and 'ungenerated' (ἀγένητον) as contradictory opposites of 'being subject to generation and perishing', but it is also the case that the two entail 'being everlasting' (see *Cael.* I, 10; 12 282a30-b7).

[162] The accusative form plus the verb διατελέω is found in the *Corpus Platonicum* in association with βίος, as for example in the *Apology*, where Socrates is commenting that without him they would "spend the rest of their life in slumber (τὸν λοιπὸν βίον καθεύδοντες διατελοῖτε)" (31a5-6).

only outside the heaven, where there is no matter, change and hence time.[163] It would therefore seem natural to identify 'those-over-there' with the plurality of unmoved movers described in the *Metaphysics*, as the majority of scholars do.[164]

However, before discussing Aristotle's definition of αἰών in (b), we must address the exegetical puzzle arising from the attribution of αἰών first to 'those-over-there' and secondly to the whole heaven (τοῦ παντὸς οὐρανοῦ).[165] In fact, it would seem that in the digression on αἰών, the focus shifts back and forth between those-over-there, outside the heaven, and the heaven itself, while αἰών is associated with both. To solve the puzzle we should either reject the thesis that the beings beyond the heaven or the heaven are directly associated with the divine αἰών or accept the claim that both meet the preconditions associated with αἰών. My solution is the latter, but in order to vindicate it, we should first consider what 'the whole heaven' refers to in the passage. In the discussion that leads to the digression on αἰών three distinct meanings of οὐρανός are distinguished.[166] Excluding a reference to the part of the heaven where the stars and planets move, both (1) the whole body comprehended by the outermost sphere (τὸ περιεχόμενον σῶμα ὑπὸ τῆς ἐσχάτης περιφορᾶς) and (2) the substance of the outermost sphere itself (τὴν οὐσίαν τὴν τῆς ἐσχάτης τοῦ παντὸς περιφορᾶς) are viable candidates.

While the emphasis on wholeness would suggest that Aristotle is thinking of (1), the immortal and divine qualification (ἀθάνατος καὶ θεῖος, 279a28) cannot be attributed to the entirety of the physical world, as this includes the sublunar part, where generation and destruction take place. The sublunar part of the universe is in fact associated with mortal life, characterised by a traditional αἰών and contrasted with the divine one in (c), confirming that the dichotomy crucial to the entire digression is between being in or outside the heaven, and is expressed by the comprehending-comprehended relation we already encountered when we analysed Plato's account of the cosmos in Section 3.1.[167]

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[163] Aristotle maintains, both in *De Caelo* (279a12-16) and the *Physics* (218b21-219a9, 251b11-28), that there is no time without change and motion.

[164] Simplicius, despite being inclined to interpret this plurality as unmoved movers, points to a dispute on the issue between various ancient interpreters, considering whether such things are the unmoved movers or the outermost sphere of the universe or the heavenly bodies (*In Cael*. 287,20-288,9). That debate is still ongoing. For instance, whereas Keizer tends to read 'those-over-there' as analogues of the unmoved movers Aristotle treats in the *Metaphysics* (Keizer 2016 p. 135-139), Degani takes them to be heavenly beings (Degani 2001, p. 43). A more comprehensive outline of the debate can be found in Keizer 2016, pp. 135-138.

[165] For a more thorough discussion of the details concerning the passage, see Broadie 2009 and Keizer 2016.

[166] "We call 'heaven' the substance of the extreme circumference of the whole or that natural body whose place is at the extreme circumference […]. In another sense, we use this name for the body continuous with the extreme circumference which encompasses the moon, the sun, and some of the stars; these we say are 'in the heaven'. In yet another sense we give the name to all body comprehended within extreme circumference, since we habitually call the whole or totality 'the heaven'" (278b10-20).

[167] The question setting out the whole digression on αἰών is whether there is any more body that is outside the extreme circumference of the heaven, hence not being included in the whole that the circumference contains (τὸ ὅλον τὸ ὑπὸ

Moreover, at the beginning of Book II, the heaven is said to be "one and everlasting with no beginning or end of all αἰών, but embracing and comprehending in itself the unlimited time (ἀλλ' ἔστιν εἷς καὶ ἀΐδιος, ἀρχὴν μὲν καὶ τελευτὴν οὐκ ἔχων τοῦ παντὸς αἰῶνος, ἔχων δὲ καὶ περιέχων ἐν αὑτῷ τὸν ἄπειρον χρόνον, 283b26-30)". The passage shows that what Aristotle means when he refers to 'heaven' in connection with αἰών is rather (2) i.e. the substance of the outermost sphere enclosing the entirety of the physical world, rather than anything within it. In fact, that substance constitutes the limit of the physical world, and has been previously referred to as the seat of all that is divine.[168] Most importantly, however, it differs ontologically from the physical world it contains, characterised by physical features such as change, time and place. That substance does not undergo change, is not located anywhere and, most importantly, comprehends the unlimited time. As such, it deserves, together with 'those-over-there', to be identified as 'non-physical' in its ontological constitution.[169]

If my hypothesis is correct, the αἰών of the whole heaven refers to the divine sort of αἰών that is common to the heavenly substance and the unmoved movers, as they are both divine and non-physical living beings.[170] In (b), Aristotle defines the divine αἰών by deriving it from the traditional notion, seen in Section 3.2: "the completeness of the whole heaven, the completeness which comprehends all time and infinity, is αἰών" (τὸ τοῦ παντὸς οὐρανοῦ τέλος καὶ τὸ τὸν πάντα χρόνον καὶ τὴν ἀπειρίαν περιέχον τέλος αἰών ἐστιν, 279a25-27).[171]

Once more, αἰών is defined as a form of completeness. However, what changes is the relationship between αἰών and time, as it is here turned upside down: whereas in the traditional definition, αἰών comprehends a *finite* time – thereby being also measured in temporal terms – the divine αἰών comprehends *all* time and infinity. The divine αἰών is a totality that is not temporally measured and, as such, it is appropriate for living beings outside the physical world, where change

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τῆς ἐσχάτης περιεχόμενον περιφορᾶς, 278b22-23). For the connection between αἰών and the limit between the physical world and what remains outside, see Keizer 2016, pp. 137-138.

[168] "We recognize habitually a special right to the name 'heaven' in the extremity or above (τὸ ἔσχατον καὶ τὸ ἄνω), which we take to be the seat of all that is divine (ἐν ᾧ καὶ τὸ θεῖον πᾶν ἱδρῦσθαί φαμεν)" (278b14-15). In the *Metaphysics*, Aristotle recognises that "the divine is that which comprehends the entire nature" as a truthful and divinely inspired doctrine of the ancient theologians (XII, 8 1074b3).

[169] In the *Physics*' account of place, the heaven is taken not to be anywhere because no body comprehends it, while it comprehends every other body (IV, 5 212b7-22).

[170] Thomas Johansen, among others, argues convincingly that in *De Caelo* the reference to divine beings entails that the heavenly bodies and beyond are said to be alive and ensouled (see Johansen 2009, pp. 18-24). Importantly, Johansen's argument in favour of this reading does not rely on the passage I am currently discussing, but on teleological considerations which are necessitating the presence of a soul as in 285a27-30, 286a7-12, 292a18-21. Ursula Coope suggests that even the heavenly bodies might be grouped together with the outermost sphere and the unmoved movers beyond heaven, insofar as their existence will also forever continue unaltered (Coope 2005, pp. 150-153). However, Aristotle describes them as being bodies in the heaven (see *fn.* 166), thus suggesting that in the contrast he is highlighting, they rather belong within the physical world.

[171] I read the καὶ in the definition epexegetically.

and time belong.[172] The divine αἰών is also different from the endless duration described by 'time and infinity', since infinity is defined in the *Physics* as 'always incomplete'. As such, it never comprehends, and is rather comprehended by completeness, as the divine αἰών does.[173] The divine αἰών, however, is a *supratemporal* totality, rather than an atemporal one. In fact, the heaven and those-over-there comprehend all time in their divine αἰών, just as the traditional αἰών comprehends part of it, so that the relationship with the temporal dimension remains crucial to defining both.[174]

If my reconstruction is correct, Aristotle's conception of the divine αἰών displays three crucial features that find a correspondence in the use of αἰών in Plato's account of time: (1) it confirms that even in Aristotle αἰών acquires an extended, paradigmatic sense that is predicated of divine and non-physical life, and displays a semantic continuity with the traditional meaning as 'lifespan' and its mereological focus on completeness, which I rendered as 'totality of life'. The translation of αἰών as 'eternity' fails to capture that persistent meaning. (2) The divine αἰών is a supratemporal totality of life, in the precise sense that, unlike the traditional αἰών, it is not measured by time, but transcends it. In Aristotle, unlike in Plato, there is no *imitative* relation between αἰών and time, but there is a comprehending-comprehended relation, highlighting the pre-eminence of αἰών's completeness over the incompleteness of time. (3) The divine αἰών, grounded in certain ontologically defining features of the living being, like immortality, unchangeability and everlastingness, does not belong in the physical world, but outside it. To be a physical living being, in fact, entails generation or, at least, change, i.e. features that impair the possession of the divine αἰών.

Given the picture presented in this section, Plato's use of αἰών in the definitional section bears clear similarities with the philosophical elaboration of the notion of divine αἰών before and after him, as it continues in Aristotle's work and perhaps had its origins in Empedocles. In particular, point (1) and point (3) apply straightforwardly to Plato's notion of αἰών: in the *Timaeus*, αἰών is associated with a living being, albeit an ideal one, and it is grounded in its ontological constitution. The living being is in fact everlasting, and hence without generation. The originality of Plato's use lies in the attribution of the αἰών-ly nature to a *form* of a living being – the CILB discussed in Section 3.1 – which is paradigmatic in the loaded sense of being used as a model for the cosmos.

[172] In the *Physics* Aristotle states that "anything that always is, insofar as it always is, is not in time: it is not encompassed by time, nor its being is measured by time (τὰ αἰεὶ ὄντα, ᾗ αἰεὶ ὄντα, οὐκ ἔστιν ἐν χρόνῳ). This is also indicated by the fact that it is not affected at all by time either" (IV, 221b3-6). Similarly, in *De Caelo*: "in the case of that which always is, there is no time for such a capacity of not being, whether the supposed time is finite or infinite; for its capacity of being must encompass the finite time since it covers infinite time" (I, 281b29-31). See Broadie 2009, p. 36, for a similar reading.

[173] In the *Physics*, Aristotle argues that "a quantity is infinite if it is such that we can always take a part outside what has been already taken. On the other hand, what has nothing outside is complete and whole" (III, 6 206b33-207a32).

[174] Despite his analysis of αἰών in Plato, Festugière puts forth the same claim about the use of αἰών by natural philosophers up to Plato (Festugière 1971, p. 260).

On the one hand, the completeness defining αἰών is seemingly associated with the completeness of the CILB. On the other, since the CILB is αἰών-ly, αἰών is not simply taken to be complete in a way that time is not (37d4), but it is also the paradigmatic term of comparison for the creation of time. With these new insights in place, we can return to Plato's account of time to develop the 'biological' level of analysis that the divine αἰών introduces.

Ch. 4: Αἰών and temporal life in the *Timaeus*

In Chapter 3 I argued that the ostensible novelty of Plato's use of αἰών as a paradigm for time is grounded in the development of the notion of a divine αἰών in natural philosophy. The divine αἰών is a totality of life – a lifespan – that is not bound by temporal delimitations, and as such, the living being it is predicated of requires a specific ontological constitution, i.e. to be everlasting and without generation, as it is typical of divine beings. The same notion, I argued, can be found in Plato's account of time in the *Timaeus*, although in this case the αἰών-ly nature is predicated of an ideal living being, characterised by completeness, I named CILB (Complete Intelligible Living Being).

In Section 3.1 I argued that the CILB is not a genus of living being and suggested that it rather is the paradigm-case of the all-complete species of living being. However, this poses a question regarding the sense in which the CILB is a living being. Sarah Broadie distinguishes two ways in which we can conceptualise the intelligible living being as the paradigm for the cosmic living being: (1) as itself a living being, hence committing to a self-predicative conception of forms in the *Timaeus* or (2) as a 'practical quiddity', that is just as a 'recipe' to make a visible living being that does not share significant features with the living being that results from it. While in the latter reading 'living being' simply defines its function as a παράδειγμα, in the former that function does not exhaust the CILB is, as it is itself a special kind of living being.[175]

Given my interpretation of αἰών as a paradigmatic totality of life proposed in Chapter 3, reading (1) should be preferred. However, insofar as the reading is committed to self-predication, opting for it requires at least a brief discussion of how to understand that the CILB is alive.[176] We might in fact doubt that the CILB resembles the way in which any physical living being, the cosmos included, is alive, namely as body-soul compounds revolving around themselves. In fact by the very description of living beings I outlined in sub-section 2.1.2, since the CILB is not in motion it cannot have any metabolism or be animated by a soul as all other living beings do.

However, it is dubious whether life requires the motion of a soul or metabolism. While such a dependence is upheld in the *Sophist*, at 248e1-249d4, it might be that the claim applies only to

[175] Broadie 2012, pp. 67-74.

[176] For evidence that Plato was committed to self-predication even post-*Parmenides*, see for instance Robert Heinaman's discussion of the *Sophist* (Heinaman 1981). For a recent interpretation that defends self-predication as not self-defeating, see Apolloni 2011. Moreover, see Barbara Sattler's argument that the intelligible living being is like the form of the beautiful, which is itself a paradigm of beauty (Sattler 2019, *fn.* 39). Her view opposes to the reading put forth by Cornford and Sedley that the intelligible living being simply is the genus 'living being' and thus an abstract essence that is not itself alive (Cornford 1937, pp. 39-43; Sedley 2007 p. 108 *fn.* 36), which I rejected on independent ground already in Section 3.1.

sensible living beings, and does not say anything about the possibility of intelligible life.[177] The difference between the CILB and the sensible living beings is after all explainable in virtue of their ontological constitution, as we have seen in Section 2.3. Additional contrivances are needed to make the cosmos in remblance of the paradigm of living being: we could include most of the works of the Demiurge, but first and foremost, it seems that the creation of a soul is required by the fact that the universe is a body, with the goal of making it intelligent (30b4-5).

Even so, since Plato does not characterise in any positive way the 'alive' status of the CILB, any claim in that sense is inevitably speculative. Nonetheless, the CILB could be profitably compared with the Demiurge, as the other main candidate in the dialogue as an intelligible living being. If my interpretation in Section 2.3 is correct, the model and the Demiurge are presented as everlasting gods manifested in the ἄγαλμα. This would suggest a similarity between the two, *qua* everlasting gods, while remaining distinct in function. Although the Demiurge is never said to be alive, it is repeatedly said to be a god (30a2, 30d3, etc.) while also being included among the intelligible things (37a1). Given that Plato in general considers gods as living beings, he would perhaps be reluctant to say that the Demiurge is not alive once he has been included among them, albeit as one separate from the physical world.

Moreover, the ordering work of the Demiurge is also presented as νοῦς persuading necessity (48a1-2) and described throughout the speech as involving theoretical as much as practical judgement, without thereby including motion. To make something intelligent, however, is also the ultimate goal in making the universe alive (30b1-3) and this might suggest that the CILB is of an akin nature to the Demiurge just as to the cosmos, and thus, as the other two, it also has a form of intellectual life. Finally, both the CILB's αἰών and the natural condition of the Demiurge, once he finished his work, are characterised as a condition of remaining, or abiding (μένοντος αἰῶνος, 37d6; ἔμενεν ἐν τῷ ἑαυτοῦ κατὰ τρόπον ἦθει, 42e5-6). This might suggest that they share a similar way of existing as living beings despite the different function they have, as model and cause respectively. Be that as it may, as we will see below, in discussing αἰῶν and time Plato clearly focuses on the ontological and structural underpinnings of the CILB, more than the content of its life, and that is perhaps why the intelligible life is not further enquired about.[178]

[177] Despite not being decisive evidence for the *Timaeus*, Aristotle's divine unmoved movers are presented as being alive despite not partaking in motion or anything physical, showing that purely intellectual life without a soul-body compound is at least a conceivable possibility (see Section 3.3).

[178] See *fn.* 188 for my distinction of life in the generic sense as opposed to the specific explication of what such life consists in.

4.1. Time and αἰών as structured totalities of life

In Section 2.4 I offered a provisional analysis of Plato's definition of time and αἰών, and of their similarity and difference. Given the insights from Chapter 3, however, we are now in a position to complete that analysis, in its connection with life and completeness. As anticipated then, Plato's definitions of time and αἰών are best analysed in terms of a structural and ontological component. In this section, these two components will be interpreted with the help of the dichotomy of *content* and *structure*, as originally thematised in Verity Harte's work.

This choice requires justification. While in my previous reading the ontological component was opposed to the structural, I also highlighted how the ontological component was grounded in the living beings of which time and αἰών are essential features. In other words, the ontological constitution of the cosmos and the CILB is part of the definitions of time and αἰών. After Chapter 3, we have a better grasp of why the two living beings are grounding time and αἰών respectively, given that the last two are now understood as *totalities of life*. The content-structure dichotomy is especially fitting for an analysis of the relation between the mereological structure (i.e. the totality) and ontologically antithetical lives. Before addressing the special application in the case of time and αἰών, however, the dichotomy needs to be introduced in general terms.

Based on an analysis of Plato's late dialogues, Harte takes both structure and content to be primitive items in his ontology, and crucial to his analysis of mereological objects.[179] Moreover, she holds that the content-structure framework is applicable to all sorts of mereological objects, both concrete, i.e. physical objects, phenomena and events, and abstract ones. My focus will be mainly on the former, since time, as argued in Part 1, is classified by Plato as a cosmic phenomenon, and is hence grounded in the physical constitution of the cosmos. 'Structure' refers to the arrangement, mathematical or otherwise, that informs mereological objects, defined by parthood and wholeness, or totality, whereas 'content' is that which instantiates the structure.[180]

Harte explains the application of the content-structure framework with the example of a dinner party. To have a dinner party we need both a structure, that is a certain seat pattern with slots for a number of guests distributed by gender, and content, that is a selection of people to be

[179] Harte 2002, p. 270.

[180] Aristotle's matter-form dichotomy is in many respects analogous to the content-structure one, when we consider its application to the physical world. However, there are some important differences which will emerge in the presentation of the content-structure dichotomy. First of all, 'form' in Aristotle seems to apply to a wider number of aspects than 'structure' in Harte's distinction, for instance when he uses the notion with regard to perception (*de An.* II, 12 424a17-24). Plato's main concern in his late dialogues are mereological structures, and in particular, the mathematical ones (in Section 6.1.2 I present an overview of the pervasive presence of *enumerable* structures in the *Timaeus*). Moreover, content does not always match with matter, insofar as Plato's ontology differs, including souls among that which is content to be structured, despite the fact that they are not bodily or perceivable. The clearest example in this respect is provided by the arrangement of the cosmic soul.

arranged as guests at the dinner. The structure, that is the seat arrangement, while being *distinguishable* from the unstructured content, is not itself an additional part of the dinner, but rather, the content, i.e. the guests, constitutes parts of the whole, i.e. the dinner party, by displaying the seat pattern. In fact, until the structure is instantiated by the people invited to the party, the people are not yet guests (i.e. parts), nor is there a dinner party (whole) yet.[181] The example, then, clearly shows that, while structure and content are dichotomic notions, they are also defined in relation to one another and they are both necessary components for the existence of *structured* objects and phenomena. In fact, structure in the physical domain is always *instantiated* structure, or structured *content*, as opposed to the abstract one.

Following Harte's framework, then, we have at hand a specific terminology to analyse physical objects and phenomena that are structured. If a physical object or phenomenon is conceived as *structured content* (i.e. as the compound of structure and content), the condition precedent to the instantiation of structure will be referred to as *unstructured content*. This latter is not identical with structured content, despite having all and the same 'material'.[182] I will describe the conjoining of structure and content resulting in a new object or phenomenon as the *instantiation of structure*. Moreover, the resulting object or phenomenon, because it is the compound of structure and content, is *partially* identified with both: the object *instantiates* structure while being *constituted* by content, thus also warranting that both should be mentioned in the definition, as it is the case with αἰών and time.[183]

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[181] Harte 2002, pp. 162-166. A second, Platonic example are words and sentences: "There are two aspects to the analysis of wholes conceived as structures in the way I have described. First, structure: in the Platonic example I extrapolated above, the structure of a well-formed sentence, abstractly conceived; what I have called a syntactic space. Second, each such whole – structure – must have some *content*: the content of a syntactic space is the (syntactic) entities that occupy positions within it, terms such as 'man' and 'learns'. Content is tied to structure, as I have said: thus, the components of a well-formed sentence are 'structure-laden'; 'man' and 'learns' are themselves syntactic entities. No less so, structure is tied to content. This relation between structure and content is implicit in the description of the structure of a well-formed sentence as '*syntactic* structure'" (Harte 2002, p. 177). It should be noted that, unless otherwise specified, the mereological terms I employ should not be interpreted as technical terms of contemporary mereology.

[182] It is true that in the case of time, something new, i.e. planets, is created in order to create time, so the creation of time does not appear as 'just' the re-arrangement of a given 'material'. Nonetheless, I would argue that we could envisage the creation of the planets *mainly* as a re-arrangement of the cosmos (and indeed that is how Plato presents it at 37d6, διακοσμῶν ἅμα οὐρανὸν): their bodies are portions taken from the cosmic body, so the souls that make the planets alive are the only entirely new 'material' introduced in the cosmos for the creation of time. Moreover, as we will see in Chapter 6, making the planets alive is instrumental to the preservation of their regular motion.

[183] I am using 'constitution' and 'instantiation' in the technical sense developed in contemporary metaphysics. The constitution relation is often illustrated by the example of the statue and the clay. When we arrange the clay in a beautiful fashion, to represent say, a god, we create a new object, i.e. a statue, which is not identical with the clay. However, the clay still exists in the same place and time as the statue and they seem to share all their material components and features (e.g. weight, colour etc.). In the same way, I would argue, a structured object or phenomenon is constituted by content. Moreover, 'instantiation' highlights that, just as properties and kinds, structures can be multiply located, and, like a symphony, they are repeatable. See Johnston 1992 and Baxter 2001 for a discussion of the constitution and instantiation relations. If my analysis of Plato's definitions is correct, we would have a clear precedent

Finally, it should be noted that there seems to be no absolutely unstructured content in the *Timaeus*: even when the universe is in its original condition of disorder, there are traces of the four elements supposedly manifesting a minimal degree of resemblance to the mathematical structures that later will define them.[184] Be that as it may, Harte points out that in the *Timaeus*, Plato seems to conceive of the cosmos in its final stage as instantiating a variety of layers of structure, built on top of each other. Hence, I will always refer to the cosmos as structured or unstructured in relative terms, that is with respect to the highest layer of structure under consideration. At each new layer in the cosmogony, in fact, the unstructured content would also be structured content with reference to the lower layer. This is especially important in the case of time, since, as we have seen in Section 2.2, it is created at the end of stage 1 in the cosmogony. The living motion of the cosmos, as we will see, is the unstructured content of time, insofar as it does not yet instantiates the temporal structure, while being structured in every other respect.

With this framework in place, we can now go back to Plato's account of time, to analyse both time and αἰών in terms of the structure-content dichotomy. I will focus on two crucial passages where αἰών and time are discussed comparatively: the first is on the definitions of αἰών and time at the end of the definitional section (37d6-7); the second expands on the definitions of the two, as it presents them as totalities integrated with the tenseless nature of the CILB and the tensed one of the cosmos respectively (38c1-3).

4.1.1. First comparison: the two definitions

The definitional section, in which the definitions of αἰών and time appear, has been discussed extensively in Chapter 2, so I will just offer a brief recapitulation of the main conclusions reached there, before bringing in the framework of structure and content. In the definitional section Plato introduces the notion of αἰών by referring to the αἰών-ly (αἰώνιος) nature of the everlasting living being serving as a model for the cosmos, i.e. the CILB. The difficulty of bringing a begotten thing like the cosmic living being to resemble the CILB in its αἰών-ly nature is explained in light of the ontological preconditions for the divine αἰών established in Section 3.3. In Plato's framework, only an ideal, and hence everlasting living being does have the right ontological constitution to be αἰών-ly in nature. Nonetheless, the Demiurge contrives a way to make the cosmos αἰών-ly too.

Importantly, what discriminates between the model and the resulting image with regard to being αἰών-ly is the adverb παντελῶς, 'completely'. As we saw in Section 3.1, similar expressions

for Aristotle's assessment of natural philosophy as that which studies both matter and form, given that the subject matter is a compound of the two (*Ph.* II, 2 194a12-27).

[184] 53a7-b2.

are elsewhere employed to qualify the CILB (κατὰ πάντα τελέῳ, 30d2, παντελεῖ, 31b1). Moreover, completeness – as I argued in that very section – is what characterises the proper features of that living being and its αἰών-ly nature is also one of them. If so, the cosmos falls short of the completeness of the CILB, in relation to its αἰών-ly feature. The cosmos, however, does become an αἰών-ly image (37d7), through the creation of time. Following these premises, Plato's definition of time is outlined in a comparison with αἰών: αἰών is defined by Plato as "remaining in unity (μένοντος ἐν ἑνὶ)", while the cosmic phenomenon imitating αἰών, time, is presented as "proceeding according to number (κατ' ἀριθμὸν ἰοῦσαν)" (37d6-7) and later as "revolving according to number (κατ' ἀριθμὸν κυκλουμένου)" (38a7-8). I concluded my analysis by highlighting how each definition involves an ontological component (μένοντος, ἰοῦσαν) and a structural one (ἐν ἑνὶ, κατ' ἀριθμὸν), and the imitation is accomplished at the structural level.

The framework of content and structure allows for a more thorough analysis of the two definitions and of the structural difference between αἰών and time. In fact, if both describe *totalities* of life, the relation between life and its structure is fittingly captured by the dichotomy. Let us start, however, from the beginning of the definitional section. We can read the Demiurge's contemplation of the now living cosmos, followed by his decision to make it even more like its model (37c6-d1), as the recognition that the cosmos is appropriately structured to resemble the model except in one respect. This respect is the αἰών-ly feature of the CILB as, when compared to it, the cosmos is still *unstructured* content.

Αἰών refers here to the supratemporal totality of life of the CILB. With αἰών, content and structure are necessarily conjoined: the content of αἰών is the static life of the CILB (μένοντος, 37d6, ἀκινήτως 38a3) and it corresponds to the ontological component. However, there is no maker of αἰών, as the ontological constitution of the living being 'naturally' (τοῦ ζῴου φύσις, 37d3) entails a fitting structural component (ἐν ἑνὶ). The structural component of αἰών is defined by unity, which I read in accordance with Plato's *Republic*, as the absolute absence of plurality.[185] Hence, αἰών is structurally a *whole* without parts – what contemporary mereology would classify as a mereological atom.[186]

Now, cosmic life is identified as the content required to create a totality of life analogous to αἰών, in the physical world. That life, however, is ontologically characterised by circular motion

[185] "You know what those who are clever in these matters are like: If, in the course of the argument, someone tries to divide the one itself, they laugh and won't permit it. If you divide it, they multiply it, taking care that one thing never be found to be many parts rather than one (εὐλαβούμενοι μή ποτε φανῇ τὸ ἓν μὴ ἓν ἀλλὰ πολλὰ μόρια)", 525d8-e3.

[186] Describing αἰών as having a structure does not imply that there is any complexity about it, nor that its content could ever be unstructured. 'Structure' here is a term employed to capture the formal and mathematical component of the definition, i.e. its being ἐν ἑνὶ. Moreover, the unity of αἰών is what dictates the creation of a complex structure 'according to number' in the cosmos, so the function of the unity of αἰών is to be an ideal term of comparison to for a structure of the physical world.

(κινηθὲν αὐτὸ καὶ ζῶν, 37c6; κινητόν, 37d5; ἰοῦσαν, 37d7; κινήσεις, 38a2; κυκλουμένου, 38a8) that is antithetical to the static life of the model. To create an image of αἰών, in the framework of content and structure, is to instantiate a suitable structure in the given content. As we have seen in Section 2.3, the difference in ontological constitution of the two *living* beings poses a substantial constraint on the similarity of the two structures.[187] Now we can add that the ontological component in the two definitions specifies the difference between the content of αἰών and time, that explains, in turn, their difference in structure.

In fact, in crafting a moving image of αἰών, the Demiurge settles for the second best structure, i.e. a κατ' ἀριθμὸν, or enumerable, structure. A thorough analysis of the temporal structure, and of its instantiation by means of the planets, requires an enquiry of its own, presented in Part III. However, it can be intuitively grasped how 'number' captures a structural complexity absent in the undivided αἰών, while also maintaining a structural similarity with unity: a number is composed of units, and because of the sameness between them, as well as the completeness that they display as a totality, the unity of αἰών is resembled both in the parts and in the whole. We will see in what way time resembles αἰών as a whole in the next comparison and later in sub-section 4.2.2, while a discussion of the parts as units of time will be offered in sub-sections 6.1.1 and 6.3.1.

In what ways, then, is time a less complete version of αἰών? The answer, I would argue, is found in the ontological constitution of the content, which results in totalities of life which are more or less complete. Αἰών is a static totality of life ('remaining in unity'), and is simple, or undivided, so that, as we will see in the next passage, its totality is present all at once.[188] On the other hand, time, as a *kinetic* totality of life, is a totality composed of parts in succession. So, the whole of time is never present at once, but only in a progressive *completion* of past, present and future parts.[189] Moreover, time is a whole divided into a plurality of parts in two distinct senses: (1) there are different *kinds* of temporal parts dividing the whole (e.g. night-and-day, month, year, 37e1-3). The reason explaining this plurality is explored in sub-section 4.2.1. (2) For each kind of temporal part

[187] I take it that what Plato is here concerned with, when he considers the life of the two living beings, is not the sort of activity that their life yields (for which see my discussion above at pp. 74-75), but rather how the ontological constitution of that life grounds the structure it display. So 'life', in the account of time, is primarily discussed insofar as it refers to the 'existence of a living being', and how that is structurally characterised. Aristotle is also considering life in this generic, or ontological sense in *De Anima*: "That it (i.e. the soul) is a cause as substance is clear: for substance is the cause of being for all things, and *living is being for living things* (τὸ δὲ ζῆν τοῖς ζῶσι τὸ εἶναί ἐστιν), while the cause and principle of living is the soul" (emphasis added, 415b12-14). The generic sense of life can be contrasted with the more fine grained notion Aristotle presents at 413a21-25, according to which life corresponds to being actually (or being capable of) thinking, perceiving, in motion and rest with regard to place, nourishing, decaying and growing.

[188] I am referring to a mereological atom as a 'whole' because I take it that Plato, in defining αἰών in terms of indivisible unity also intends to stress its absolute completeness as a *totality* of life. In fact, in the next passage, Plato refers to αἰών as a totality, despite not being composed of parts. For a similar interpretation, see Proclus' comparison between the complete year and αἰών as two *wholes* (*fn.* 196).

[189] Mesch underlines the 'succession' of time-units as the chief difference between time and the unity of αἰών (Mesch 2009, p. 97).

there are many successive instances, as they are repeated in a sequence. Importantly, the instances in the sequence are distinguished from one another by the forms of time that have come to be (χρόνου γεγονότα εἴδη, 37e4), that is by distinctions of tense, as we will see below.[190]

4.1.2. Second comparison: tensed and tenseless totalities of life

The second comparison, at 38b7-c3, is a restatement of the imitative relation between time and αἰών first outlined in the definitional section. However, it incorporates two new aspects of the analysis: (1) the tenseless and tensed expressions associated respectively with the CILB and the cosmos; (2) the ἅμα relation between time and the cosmos, mirroring the one between αἰών and the CILB (see sub-section 2.4.2). The comparison is the following: "And it [the heaven] came to be after the model whose nature is διαιώνια (τὸ παράδειγμα τῆς διαιωνίας φύσεως), so that it might be as much like its model as possible. For the model is existing for all αἰών (πάντα αἰῶνά ἐστιν ὄν), while it, on the other hand, has come to be, is, and shall be for all time, up until completion (διὰ τέλους τὸν ἅπαντα χρόνον γεγονώς τε καὶ ὢν καὶ ἐσόμενος)".[191]

I highlighted in Section 3.2 and 3.3 that πάντα αἰῶνά is a recurrent expression employed by Plato and Aristotle as a more specific expression describing the divine and everlasting life as a supratemporal totality. Hence, just as Aristotle predicates it of the non-physical gods living at the extremity of the heaven, Plato associates it with the CILB, i.e. an ideal and all-complete living being. In both authors, moreover, all time (τὸν πάντα χρόνον, τὸν ἅπαντα χρόνον) is presented as being hierarchically inferior to 'all αἰών'.[192]

However, unlike in the first comparison, in the present passage time and αἰών are addressed only indirectly, as the focus is rather on the cosmic living being and the CILB, and the ontological difference in the existence they lead, stressed by the tensed and tenseless expressions. Before looking at the details of the comparison, we first need to briefly touch upon the section of tense that precedes the passage (37e3-38b5). As I pointed out in the Introduction, that section is a digression on tense, and as such, it concerns time only indirectly. In fact, I argued, tensed distinctions are presented as fundamental to the physicality of the world, as they stem from becoming and are associated with motion (" 'Was' and 'will be' are properly said about the becoming that passes in

[190] Cornford is the first, to my knowledge, to point out the difference between time and αἰών as one between a divided and undivided structure (Cornford 1937, p. 102).
[191] The translation is a modified version of Zeyl's. I will defend some of the more controversial modifications in the continuation of this section. For a discussion of the textual issues that have been raised concerning the passage, see *fn.* 27.
[192] A similar expression, πρὸς τὸν σύμπαντα χρόνον, already appeared at 36e4-5, to qualify cosmic life.

time, for these two are motions", τὸ δὲ ἦν τό τ' ἔσται περὶ τὴν ἐν χρόνῳ γένεσιν ἰοῦσαν πρέπει λέγεσθαι—κινήσεις γάρ ἐστον. 37e4-38a3).

They are contrasted with the single tenseless qualification pertaining to the ideal kind, i.e. 'is' (τῇ δὲ τὸ ἔστιν μόνον κατὰ τὸν ἀληθῆ λόγον προσήκει 37e6-38a1). The contrast drawn in that section, then, is not between αἰών and time, but a broader one, between the sort of distinctions appropriate to the physical and ideal kind. Time, as a non-fundamental and created feature of the cosmos – its totality of life – is characterised by tensed expressions, just as any physical object or phenomenon. The reason to introduce tense in as a topic of discussion within the account of time lies in the role of time as a unique frame of reference in the physical world,. The creation of time renders tense more intelligible by specifying tensed distinctions with temporal qualifications, as explained in the Introduction.

My reading of the relation between time and tense, I would argue, is confirmed by the employment of tensed and tenseless expressions in the passage under scrutiny, to contrast once more the ontological constitution of the cosmic living being and of the CILB as a physical and ideal living being respectively: tensed distinctions apply to the kinetic life of the cosmos, which in the analysis above has been identified as the content of time, while a tenseless present corresponds to the static life of the CILB – the content of αἰών. It is in fact emphasised that the cosmos has come to be, despite being in the present and future tense (γεγονώς τε καὶ ὢν καὶ ἐσόμενος), hence existing in a tensed way for the totality of its life (i.e. for all time), whereas the CILB exists tenselessly (ἐστιν ὄν) for its paradigmatic totality of life (i.e. for all αἰών).[193] Hence, tensed and tenseless distinctions – expressive of the ontological constitution of the two living beings – are paired in the passage with the appropriate totality of life – 'for all time' and 'for all αἰών'.

The relevance of the present comparison, then, lies in the confirmation that both time and αἰών are presented as *totalities* of life, as it highlights once more that they resemble each other because of their structure, whereas their content differs ontologically. Moreover, I would argue, the passage also addresses the different sort of completeness that αἰών and time attain, as totalities. In fact, one might worry that, given the content of time, i.e. cosmic life, which is unceasing (36e4-5), time, as the totality of that life, would be never-ending. If so, time would be a totality that is always in completion while never complet*ed*, just as in Aristotle's understanding of time as an unlimited totality, touched upon in Section 3.3, and hence being antithetical to the completeness of αἰών.

[193] The most obvious textual reference for emphasising that the cosmos' way of being was tensed even 'before' the making of time is at 31b2-3. Several Stephanus pages before the account of time, the cosmos has been already accounted for as a single living being and will remain so, displaying its tensed nature: ἀλλ' εἷς ὅδε μονογενὴς οὐρανὸς γεγονὼς ἔστιν καὶ ἔτ' ἔσται. It should also be noted that qualifying the cosmos as existing 'for all time' is a restatement of the ἅμα relation between time and the cosmos outlined at the end of the definitional section (37e1-3) and then restated immediately before the present passage (38b6-7, see Section 2.4).

In Plato, however, time bears resemblance to the paradigmatic completeness of αἰών as an undivided whole, insofar as its content allows. It is for this reason, I would argue, that τὸν ἅπαντα χρόνον while analogous to πάντα αἰῶνά, has the further qualification, διὰ τέλους, to be rendered as follows: "for all time, up until the completion".[194] Despite the lack of attention received from commentators, the additional qualification is of great importance in establishing a link with the completeness of αἰών, as it emphasises that time also attains completeness, albeit in the dynamic sense of a final stage of the totality, or point of completion.

If I am correct in my assessment so far, an important consequence follows. As Proclus states in his commentary, τὸν ἅπαντα χρόνον should not be read as an infinite succession of parts, in an Aristotelian fashion. Rather, Plato's account seems to present time as structured in a *finite* sequence of parts. This reading, I will argue in the next section, is further supported by Plato's introduction of a *complete* year, as the natural conclusion of that finite process of completion.[195] Time, as a finite totality, then, is a moving image of αἰών in the further sense of bearing a strong resemblance to the traditional notion of αἰών as 'lifespan', discussed in Section 3.2, where it was generally associated with mortal living beings. Just as the traditional lifespan, time seemingly is a totality which has a starting point and a final one, and a finite number of steps between the two. Time, then, is correctly described as the cosmic *lifespan*, in Plato's understanding.

There are, however, two all-important differences, which will be touched upon especially in sub-section 4.2.2: firstly, cosmic life does not end with the completion of time, as physical gods are granted an endless persistence by the Demiurge; secondly, unlike the cosmic αἰών, the traditional αἰών of mortal living beings is measured in time, as there is always further past and future time beyond a mortal lifetime. In the case of Plato's conception of time as a cosmic lifespan, however, there is further time only in the sense in which that totality is endlessly *repeated*.

[194] Διὰ τέλους is a fixed expression, and can be also rendered as 'through to the end', 'completely', 'throughout', and in general appears to be used to describe a process directed toward a state of completion and maturity (*LSJ s.v.* τέλος).

[195] "It is just like in the case of divine bodies where some have different cycles from others, but all of them have been antecedently comprehended in the cycle of the generated divinity. This contains many cycles in which Saturn returns to the same point, and many cycles of the Sun and Moon, and every time exists in the single cycle of the universe […]. But the World Soul possesses as its measure the whole extent of time and it entire unfolding – an extension than which there can be no greater, unless it be greater by repeating again and again, for it I thus that time is unlimited (μέτρον ἔχει τὴν ὅλην ἔκτασιν τοῦ χρόνου καὶ τὴν ὅλην ἐξάπλωσιν, ἧς μείζων οὐκ ἔστι παράτασις,εἰ μὴ τῷ πάλιν καὶ πάλιν)" (*In Ti.* III, 289, 10-22). Moreover, later he states that "the time that belongs to the period of the universe is complete because it is not a part of anything. Rather, it is universal or total in order that it may imitate αἰών […]" (IV, 92, 18-20).

4.2. The cosmic periods as the content of time

On my reading, time is understood as structured content, where the content is cosmic living motion and the structure is a totality 'according to number'. Now, to be alive for the cosmos consists in circular motion around itself led by the cosmic soul and articulated in the eight rotations of the circle of the Same and the Different (see Chapter 3, p. 54). I will refer to the eight rotations of the cosmic soul as cosmic *periods*, based on the Greek word περίοδος, that Plato consistently uses to refer to the circular path as well as to their living motion.[196] These periods, collectively taken, constitute cosmic living motion, and, as such, they are identified as the *content of time*.

This conception of time, I would argue, has some important upshots for the parts and the whole that constitute time. As we have seen in Section 4.1, content is never completely unstructured, in Plato's cosmogony, and in the case of the content of time, it is already as structured as it should be *before* the creation of time, in all but one respect – the temporal one. Hence, I will argue, the content, already structured in eight cosmic periods serves as the basis for the temporal structure, both with respect to the parts and as a totality.[197] In sub-section 4.2.1 I will focus on how the number of parts of time corresponds one-to-one to the number of cosmic periods. In sub-section 4.2.2 I will argue that the arrangement of cosmic periods explains why time is structured as a finite totality.

4.2.1. Life-rotations and temporal parts

In this sub-section I will focus on the parts of time. In sub-section 4.1.1 I distinguished two senses in which time is divided in parts. I already discussed the first sense, referring to the successive instances of the same part that are qualified by the forms of time that have come to be. However, in the second sense, time is divided in different *kinds* of parts: nights and days, months, years and other five nameless ones, as we will see. My claim is that, in Plato's account, the number of

[196] The Greek word περίοδος appears 23 times in the *Timaeus*, and the meaning the word assumes is mostly consistent throughout (see the Index of occurrences, *s.v.* περίοδος, p. 145). Plato invariantly refers with περίοδος to the cosmic periods and to the humans' ones (taking place in their heads), and even the distorted ones in the lower animals are very defective versions of the unvarying and divine ones. As we will see in Section 5.3, in the astronomical section of Plato's account of time, the term will not just refer to the cosmic periods, but also to the planets attending those same motions in their revolutions. The meaning of 'period' should be distinguished from the already temporal connotation that it often has in modern English. In modern physics 'period' retains at least one crucial aspect of the ancient astronomical meaning, that is indicating a repeated process in which every step starts again in the same state as the previous one (*OED s.v.* 'period').

[197] The discussion of the temporal structure that I will offer in this section is provisional, as I haven't yet accounted for how the temporal structure is instantiated in the content, and what the instantiation of the temporal structure adds that was not there before. These two questions will be answered in Chapter 6. Still, significant connections can be established by focusing on the content of time alone. This, I take it, provides further evidence that time, in Plato's account, is indeed constituted by cosmic life, as articulated in the eight cosmic periods.

different parts composing the temporal structure corresponds to the number of cosmic periods – i.e. eight. This correspondence is explained on my reading by the identification of the cosmic periods as the content of time. In fact, the complexity of the temporal structure is based on the complexity exhibited in the already structured content (cosmic life). The upshot of this claim is that Plato rejects the view that time is potentially divisible in infinitely many ways, hence conceiving the temporal structure as *rigid*.

Now, in order to create time and its parts, there is a further and equally essential component, i.e. the planets, that I am intentionally leaving aside until the enquiry in Part III. As we will see in Section 6.2, the Demiurge creates the seven planets to delimit the parts of time, by means of their visibility. Moreover, the planets are not only tightly connected with the creation of time, but also, as we will see in Section 5.2, their revolutions follow the course of the eight periods of the cosmos, as described in the astronomical section (38c7-d4).[198] Since, however, their function in relation to time has not yet been clarified, I will consider here only the relation between the parts of time and the periods of the cosmic soul.

Only three parts of time are listed in the account of time: night-and-day, month and year. They correspond, one-to-one to the period of the Same, and to the first and the second period of the Different. Despite having a name only known by few experts (39c5-7), the other five periods should be treated as equally corresponding to a part of time, as planets also move along those periods and they are equally involved in the fulfilment of the complete year (τῶν ὀκτὼ περιόδων, 39d5). As a result, we have eight parts of time corresponding to the eight periods of the cosmic soul. On my reading of Plato's account, the one-to-one correspondence has a natural explanation. In fact, if time is understood as the cosmic lifespan, the parts of time composing it are best understood as *stages* of that lifespan. Now, the correspondence above, on this reading, simply shows that the stages of the cosmic lifespan are correctly based on the periods of cosmic life. We could counterfactually imagine that, if the internal arrangement of the cosmic soul were simpler, e.g. made of only two circles, there would have been only two parts of time as a consequence. Likewise, if the periods were to have varying speeds, so would the corresponding parts of time 'expand' or 'shrink' in its length.

If this reading is correct, we can describe the temporal structure, in Plato's account, as *rigid*. In fact, there is an objective basis, on this account, to identify a finite number of ways to divide time, as the complexity of the temporal structure is only as complex as its structured content. Now, this feature could be seen as an obvious weakness of the account from our point of view. However,

[198] For example, at 39c2 and c5, the περίοδοι are clearly identified with the planetary revolutions. See Section 5.3 for my hypothesis on the use of the term to refer the planetary revolutions.

it provides a rebuttal to one of the two objections raised by Aristotle against the identification of time and cosmic motion (see Section 1.1).[199] Aristotle wonders why only the full rotation is considered time, and not any of its subdivisions, but Plato might reply that, if time is the cosmic lifespan, the division of time is bound to be based on the fulfilment of cosmic periods, hence restricting the number of ways it is divisible.[200]

However, even someone sympathetic to Plato's conception of time might object along the same lines as Aristotle that while time is constituted by cosmic periods, and it might not be divisible in an infinite number of ways, it could still be divided in *more* than eight ways. For instance, one could point out that the day could be divided into two halves at noon, and the year into four parts with reference to the two solstices and equinoxes. Plato is arguably aware of how variegated the planetary revolutions taking place along the cosmic periods are (πεποικιλμένας δὲ θαυμαστῶς, 39d2). This becomes clear, for instance, when he explicitly mentions temporal demarcations beyond just the eight parts of time, such as the seasons dividing up the year.[201] In order to fully address why nights-and-days, months, years and so on have a special relevance in dividing the totality of time we need to understand first what a κατ' ἀριθμὸν structure of time consists in, as expounded in Section 6.2 and 6.3. There I will argue that, because the time has an *enumerable* structure, the parts of time corresponding to the eight periods stand out as optimal *units* of that structure.

4.2.2. The complete year as the totality of time

In this sub-section I will discuss time as a *totality* of cosmic life. I will defend, in particular, the hypothesis that time is conceived by Plato as a *finite* totality, corresponding to the complete year, and furthermore argue that the finitude as much as the extent of that totality are based on the periods of the cosmic soul.

While any version of a literalist interpretation of the *Timaeus* will hold that what Plato is describing at 36e4-5 is an absolute beginning of cosmic living motion, and, with it, of time, the ἅμα relation at 38b6 adds that as the cosmos and time were created together, they would also dissolve together (ἅμα καὶ λυθῶσιν, 38b6). So, if the διὰ τέλους qualification suggests, as I read it, that time has a point of completion and hence a finite sequence of parts in a succession, it would seem to

[199] "And yet even part of the motion of the whole is, in a way, time, even though it is a part (since we took just a part of a rotation, not the rotation)" (*Ph.* IV 10, 218b1-3).
[200] Aristotle's objection is grounded in his account of time, according to which time takes on continuity from motion, just as motion inherits it from spatial magnitude, hence being potentially infinitely divisible (*Ph.* IV, 11 219a12-14).
[201] Widening the scope of our enquiry to other cosmological passages Plato refers to other temporal demarcations which are potentially employable as divisions of time, like seasons, or the regular interval marked out by solstices and equinoxes (*Ti.* 47a; *Phlb.* 30c; *Lg.* X 886a, 889b).

entail that the completion of time brings about a cosmic dissolution. And yet Timaeus explicitly rejects that the cosmos will ever be destroyed: its life is unceasing (36e4) and is not affected by disease and old age (33a2). Moreover, its body, once unified, will never be dissolved (32c3-4), as all things made by the Demiurge.

Yet, even if the extreme possibility of cosmic death is excluded in the *Timaeus*, there is room left to consider other hypotheses that are compatible with understanding time as a finite totality of cosmic life. One such hypothesis is presented at length in the *Statesman*, where it is argued that cosmic living motion comes to be increasingly disrupted from within, hence periodically requiring salvation from a near-death condition by a divine helmsman, to be restored. Importantly, the circumstance of the potential cosmic death is marked out, at each new iteration, by the same amount of time (ὅταν αἱ περίοδοι τοῦ προσήκοντος αὐτῷ μέτρον εἰλήφωσιν ἤδη χρόνου, 269c6-7; ἐπειδὴ γὰρ πάντων τούτων χρόνος ἐτελεώθη, 272d6-7), so that we could consider that timespan to be identified with the cosmic natural lifespan, as after that point, cosmic life is restored 'artificially' by an external god.[202]

Other aspects of the cosmic catastrophe of the *Statesman* could be hinting at compatible accounts. The measure of time mentioned in the *Statesman*'s myth could be fittingly connected to the complete year (τὸν τέλεον ἐνιαυτὸν, 39d4), as this latter corresponds to a significant event in cosmic life: the collective return of all eight periods of the cosmic soul to their initial position.[203]

Moreover, the disruption of cosmic life in the *Statesman* is said to also have catastrophic consequences for life on Earth, killing off most human beings (273b2-e4). A similar catastrophe is described at the beginning of the *Timaeus* by the Egyptian priests to Solon. They report of a periodical cleansing of the Earth, due to a deviation in the course of the heavenly bodies (τῶν περὶ γῆν κατ' οὐρανὸν ἰόντων παράλλαξις, 22d1; ῥεῦμα οὐράνιον, 23a8), in the form of huge fires and floods which brings the human population to shrink significantly. Notably, παράλλαξις is the term used to refer to the change of direction of the cosmos and the heavenly bodies in the *Statesman* (τῆς αὐτοῦ κινήσεως παράλλαξιν, 269e4). Moreover, the catastrophic events in the *Timaeus* seem to be also bound to a certain interval of time, in their iteration (διὰ μακρῶν χρόνων γιγνομένη, 22d2; πάλιν δι' εἰωθότων ἐτῶν, 23a7). Yet, no corresponding *cosmic* catastrophe is ever mentioned in relation to the periodic cleansings of the Earth in the *Timaeus*, and in the way they are presented,

[202] "At times it is helped by the guidance of another, divine, cause, acquiring life once more and receiving a restored immortality from its craftsman, while at other times, when it is let go, it goes on its own way under its own power" (270a3-6).

[203] Van der Sluijs offers an exhaustive discussion of the complete year and its relation to the catastrophic consequences of the deviation of the Sun, taking into account both the *Timaeus* and the *Statesman* (Van der Sluijs 2006, pp. 60-69).

those cleansings seem to be an intended feature of the cosmic arrangement rather than a consequence of its disruption.

Certainly, the different outlook on the perfection of the cosmos between the *Timaeus* and the *Statesman* demands caution in connecting the two accounts. However, it remains a possibility worthy of discussion, whether the *Statesman* is (1) an account of the cosmic lifespan that is compatible with the *Timaeus*, but intentionally kept apart, as the latter focuses on the foundational moment of the cosmogony and its optimal results, rather than on the subsequent history of the cosmos; (2) or else, the *Statesman* is an earlier, or even an alternative and rejected version of Plato's cosmological account in the *Timaeus*. Certainly, in the *Timaeus* which is plausibly posterior to the *Statesman*, the cosmos is presented as flawless in the preservation of its own life because of its excellent maker, so adding to the picture a periodical decline of that life, to the point of being threatened by death, would attenuate the flawlessness of the Demiurge's craft. However, even if (2) is more plausible, and what is presented as a cosmic catastrophe in the *Statesman* is conceived in the *Timaeus* as a periodic cleansing of the Earth that is part of the Demiurge's plan, the notion of a finite cosmic lifespan could be still profitably compared to the complete year.

Timaeus only briefly accounts for the complete year, as follows: "It is none the less possible, however, to discern that the complete number of time fulfils the complete year (ὅ γε τέλεος ἀριθμὸς χρόνου τὸν τέλεον ἐνιαυτὸν πληροῖ τότε) when the relative speeds of all eight revolutions have been accomplished together and, measured by the circle of the Same that moves uniformly, come to a head (σχῇ κεφαλὴν)".[204]

The interpretation of the passage hinges on whether we uphold a literal or anti-literal reading of the cosmogony. For instance, Cornford argues that the passage should be taken as an exemplary fictional passage, stating that "the hands of a perfect clock would regain at every moment the position at which they were twelve hours before. Since the celestial clock was never set going at any moment of time, there was never any original position to serve as a starting-point. The period, whatever it may be, is beginning and ending at every moment of time".[205] In Cornford's reading, evidently, any absolutely original position for the cosmic periods to reach would be arbitrary, given that there is no beginning of time, nor of cosmic life. In an anti-literalist reading, then, the complete year is simply the amount of time it takes before the planets display again the same configuration. The interpretative burden, however, seems to be, as with other passages, on the anti-literalist. In fact, one might wonder why the complete year is presented by a number of terms that put emphasis on the attainment of an actual completion (τέλεος twice, πληροῖ, ἁπασῶν), stressing that an original

[204] 39d2-7.
[205] Cornford 1937, p. 117.

position, displayed by the planets, is indeed necessary to determine *when* (τότε) the completion takes place.

A literalist reading, I would argue, fits better with Plato's careful description of the fulfilment of the complete year as an outstanding *event* in the course of time. If the cosmic periods and time have an absolute beginning, it follows that there is an objectively defined original configuration of the cosmic circles relative to each other displayed by the planets, and that configuration corresponds to the astronomical 'head' mentioned in the passage.[206] If so, the final configuration is identical with the initial setting of all the circles and planets. Moreover, such configuration presents itself only once all other possible configurations have been deployed.

Admittedly, Plato never clarifies what the planetary configuration marking out the 'head' would look like. The description of the Demiurge positioning the planets each on one subdivision of the circle of the Different, at 38d1-7, does not provide any detail concerning their position on the circle. However, we have at least one indication in terms of planetary configurations for the end – and hence the beginning – of the month, which is marked out when the Moon has overtaken the Sun (ἐπειδὰν σελήνη περιελθοῦσα τὸν ἑαυτῆς κύκλον ἥλιον ἐπικαταλάβῃ, 39c3-4). Presumably, that same configuration is also part of the configuration that marks out the complete year. While there are no sufficient clues to infer which exact position Plato has in mind for each of the planets to reach as their original position, it seems that sufficient ground is given in the account to hypothesise that such position exists and is within view from the Northern Hemisphere. It must, in fact, be accessible to humans observing the starry sky, if they are to form a correct notion of time (47a6).

However, even if the literalist interpretation of the complete year is sound and the 'head' is an objectively defined configuration of the planets, given that in Plato's account cosmic life is never-ending, the complete year would still not correspond to a finite cosmic lifespan, or totality of time. In fact, once the complete year is fulfilled, if cosmic life continues, so would its lifespan, and there would be *more* time after the complete year. Therefore, the objection concludes, the complete year cannot be identified with the totality of time, and it rather is an outstanding *part* of time.[207]

The objection above, I contend, does not consider a different sense of finite totality compatible with there being *more* time than a complete year. The focus, as I argued in sub-section 4.1.2, should be on the imitation of αἰών. Time, in my reading, resembles the undivided totality of

[206] It is however possible, albeit not very compelling, to hold an anti-literalist view and accept the notion of a relative but objective original position. Proclus, for example, holds both views (see *fn.* 196). He however does not clarify on what basis the 'head', that is the original and final configuration of the cosmic periods, is determined.

[207] Mohr claims, for instance, that "the complete year is a unit of time which is parasitic compounding of other units of time. 'The complete year' is relevantly similar to the expression 'a month of Sundays'" (Mohr 1985, p. 69. *fn.* 23). His take is opposed to Cherniss' comment that, correctly, I hold, reads Plato's notion of 'number of time' as always capturing a finite amount (see Section 6.2 for an extensive discussion of the expression).

αἰών, given all at once, while being a totality of parts in a sequence that progresses towards a completion. A completion, however, does not entail 'destruction': as Aristotle points out in his discussion of completeness, the meaning of τέλος as 'end' or 'death', is a derivative one, as it conflates the proper meaning of the term with specific instances of completed processes. To reach a τέλος is primarily to reach a stage where there is nothing missing, as in the growth of a living being or the crafting of an artefact, and only in this sense we consider that final stage also as the *end* of a process, even if in certain cases the end does correspond to destruction.[208]

In light of the framework of content and structure, it is possible to account for a finite totality of time that does not entail the destruction of time. In fact, there is more time after the fulfilment of the complete year because of the *content* of time, i.e. the eight cosmic periods, that continue their course after having returned to their original configuration. However, the fulfilment of the complete year also entails the end of the temporal *structure*, as all the configurations of the cosmic periods have been displayed by the planets. What follows the fulfilment of the complete year is more time, but only in the sense in which the same totality is repeated, just as an entire symphony could be repeated in a loop: the content is *different*, though it instantiates, again and again, the *same* structure and marks out the stages of the same cosmic lifespan.

To render this interpretation more intuitive, we can entertain a parallel case that shows that the above proposal seems natural, when we are not concerned with time. As Harte points out, cases analysable in the framework of content and structure are found most prominently in the *Philebus*.[209] I will focus on letters and the alphabet, as they provide the most straightforward analogy with time, in my reading. Letters are in fact intuitively parts of a whole, the alphabet, and if the whole alphabet is uttered, letters constitute a sequence, very much like the one that defines time in its process of completion.[210]

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[208] "Hence, since the end is an ultimate thing, we extend the meaning of the term to bad senses, and speak of perishing 'completely' or being 'completely' destroyed, when the destruction or calamity falls short in no respect but reaches its extremity. Hence, by an extension of the meaning, death is called an 'end', because they are both ultimate things". (*Metaph.* V, 1021b25-29).

[209] In the *Philebus*, during the long digression on the one and the many Socrates famously introduces the two most prominent examples of subject-matters in which to become an expert, it is crucial to discern the definite number of kinds of beings falling within that domain as a whole. The best examples to compare with time are the subject-matter of grammar – i.e. letters, syllables, words and sentences – and of music – i.e. tunes, musical scales and rhythms **(**17c-e; 18b-d). Later on, however, it is suggested by the fourfold ontology that there are many more sciences that should work according to similar principles in analysing their subject-matters. The study of the planets and of time, i.e. astronomy, could well be among these, as Plato clearly classifies the heavenly phenomena as part of the well-arranged mixtures (28e2-5, 30c4-8).

[210] The parallel is most evident with letters, because, unlike with musical notes, letters are limited in number, so that an exact repetition is necessary once all the letters are uttered. On the contrary, the *Philebus*' account could allow an endless progression of notes following a musical scale, moving to an ever higher pitch. With time, or letters, there is no such endless variety of qualitatively different parts. The difference with time remains in that the alphabetical order is not the only whole letters compose, nor the primary one.

We can imagine the unlikely but illustrative scenario of an ancient Greek person assigned with the task of uttering all the Greek letters in the alphabetical order, and to pursue in this task *ad infinitum* (assuming such a person has no physiological limitations and an unfailing capacity to concentrate on the task). Presumably, the Greek person would start from α and quickly reach ω. The first time the alphabet is uttered, *all* letters are uttered already. However, since this person's task is to go on uttering *ad infinitum*, and the letters of the alphabet are a finite number, the process of uttering the whole alphabet would start again, from α onward, in the same order. In this way, we can envisage the Greek person going on forever in repeating the same alphabet, just as cosmic life will go on forever, constituting the same cosmic lifespan again and again.

We can present the repetition described in the example in terms of sameness and difference by referring to utterances (or mere sounds) on the one hand, as content, and letters and the alphabet on the other, are instantiated structure: the new α is not the same α the Greek person uttered the first time, as they are *different* utterances, or content. However, it is ultimately the *same* letter α which is uttered, insofar as the same articulation of sound is displayed in the order required by the alphabet, i.e. the *same* totality repeated over and over.[211]

The same scenario can be imagined with time: the parts of time are just as the letters and the complete year is just as the alphabet. Once the complete year is fulfilled, the totality of time is accomplished, just as when the alphabet is uttered, all letters are. After, the periods of the cosmic soul (i.e. the content of time), continue, just as the utterances. However, the parts of time, insofar as they are defined by the temporal structure, are always the same ones, repeated in the same sequence, until the totality of the complete year is once more fulfilled, marked out by the configurations of the planets.[212] The endless repetition of the finite totality of time is the only way in which cosmic life bears resemblance to the undivided completeness of αἰών, and the planets, as we will see in Chapter 5, are given the role of the (happy) Sisyphus in bringing about that completion over and over again.[213]

To conclude, my interpretation of the complete year has an important upshot that supports my overall claim concerning the periods of the cosmic soul as the basis for the temporal structure. In

[211] "S: What I mean is clear in the case of letters, and you should take your clue from them, since they were part of your own education. P: How so? S: The sound that comes out of the mouth is one for each and every one of us, but then it is also unlimited in number. P: No doubt. S: Neither of these two facts alone yet makes us knowledgeable, neither that we know its unlimitedness nor its unity. But if we know how many kinds of vocal sounds there are and what their nature is, that makes every one of us literate", 17a8-b9.

[212] This is perhaps what Aristotle has in mind when he gives us the following remark about a certain sense of sameness of time: "Moreover, as it is possible that one and the same motion takes place again and again, likewise a time can take place again and again, as with the year, Spring and Autumn" (*Ph.* IV, 12 220b12-14).

[213] The notion of a finite totality of (astronomical) time is appropriately captured in later Greek philosophy by the term 'ἀποκατάστασις', or restoration of the original condition. Proclus remarks that just as the cosmic living being comprehends all the other divine souls, so time comprehends their apocatastasis. Since the apocatastasis of the universe comprehends all the others, it is the one that corresponds to the totality of time (see *fn.* 196).

fact, the way the cosmic periods are structured is essential to (1) having a finite totality of time, and hence to imitating the completeness of αἰών. Moreover, (2) their velocity determines the length of the totality.

Firstly, the content of time is a suitable basis to create a finite totality of time. In fact, the circular path of the periods of the cosmic soul is a necessary precondition, together with the regularity of their motion, to have, as a result, a finite set of possible configurations for the planets. If that wasn't the case, the temporal structure could in principle never reach a point of completion and return to the original configuration.[214] Moreover, the proportionate velocities of the cosmic periods set up by the Demiurge (36d6) warrant that the parts of time measure out the whole, as we will see in sub-section 6.2.2 and 6.3.2. Again, if the parts of time of time were incommensurable, the fulfilment of the complete year would not be possible, since the astronomical 'head' would never be reached together by the planets. Secondly, the content of time determines the *length* of the totality of time consists in. Just as the speed of individual periods of the cosmic soul determines the length of their corresponding part of time, so the relative velocity of the eight periods (ἁπασῶν τῶν ὀκτὼ περιόδων τὰ πρὸς ἄλληλα τάχη σχῇ, 39d4-5) determines whether a longer or shorter totality of time is fulfilled.

[214] Plato recognises cosmic rotation as the best motion, because it is free from wandering and akin to intelligence in the *Timaeus* (34a2-3). He moreover praises the structural sameness that circular motion preserves, both in the *Laws* and the *Statesman* (*Lg.* X 898a8-c1, *Plt.* 269d-e). Despite my rejection of Proclus' interpretation of the account of time, his emphasis on the similarity in structural sameness between circular motion and the absence of motion correctly underscores a crucial basis for the cosmic image of αἰών to be accomplished**:** "The more gifted among them [i.e. the multitude] proceeded to a consideration of αἰών and observed that there was not merely motion in the universe but an everlasting motion that was orderly and circling around in a manner that was always the same" (*In Ti.* IV, 9, 2-7).

PART III – REVOLVING ACCORDING TO NUMBER

"Quid mundus, quae causa Deo, ratioque creandi,
Unde Deo numeri, quae tantae regula moli,
Quid faciat sex circuitus, quo quaelibet orbe
Intervalla cadant, cur tanto Iupiter et Mars,
Orbibus haud primis, interstinguantur hiatu:
Hic te Pythagoras docet omnia quinque figuris.
Scilicet exemplo docuit, nos posse renasci,
Bis mille erratis, dum fit Copernicus annis,
Hoc, melior Mundi speculator, nominis.
At tu Glandibus inventas noli postponere fruges"
(Kepler – Mysterium Cosmographicum, Lector Amice Salve)

In Chapter 4 I argued that both αἰών and time are accounted for as *totalities of life*. In particular, time is the structured totality of cosmic life (i.e. the cosmic lifespan), created in resemblance of the unitary and undivided life (αἰών) of the CILB. In Section 4.2 my understanding of Plato's definition of time as the compound of content (the eight periods of the cosmic soul) and structure (according to number) has been substantiated by an enquiry into how the already structured content of time is the basis for the temporal structure, with regard to both the parts and the whole.

So far, then, the focus has been mainly on the periods of cosmic life, that is on the *content* of time.[215] However, in my reading time is a compound of content and structure. The focus of this part will be on how that content becomes *structured*, that is on the creation of time. In this enquiry I will try to answer two connected questions – the 'how' and 'what' question – about the temporal structure that I only touched upon in the previous parts of the thesis: *how* the content comes to instantiate the temporal structure and *what* is added to the content with the instantiation of the temporal structure. My claim will be that time, as *structured* content, is defined by two aspects appearing in the definition of time, both at 37d5-7 and 38a7-8: (1) visibility: time is a moving *image* of αἰών; (2) enumerability: time revolves *according to number* (κατ' ἀριθμὸν). The two aspects are interdependent since the enumerability of time is brought about by means of visibility.

[215] In the current chapter, for expositional purposes, I will generally refer to 'cosmic motion', or 'rotations', bracketing the fact that the movements in question are more appropriately described as 'periods', i.e. a form of life and intelligent activity. Still, what I argued in the previous chapters about the essential relation entertained by time and cosmic life should be kept in mind throughout the present enquiry.

However, as we established in Part I, Plato conceives of time as a *cosmic* phenomenon, and its creation is accomplished *via* the creation of the Sun, the Moon, and the five planets (Mercury, Venus, Mars, Jupiter and Saturn). To answer the 'how' and 'what' questions, then, we first need to focus on Plato's treatment of those seven heavenly bodies. Gregory Vlastos correctly remarks that Plato never refers to the Sun and the Moon as 'planets', thus maintaining the traditional distinction between them and the other five.[216] Nonetheless, for the purposes of this enquiry, I will employ the term 'planet' to refer to each of the seven, the plural form to refer to them as a distinct group of heavenly bodies, acting together in fulfilling a single function, and 'planetary' to refer to their revolutions, as opposed to the fixed stars'.

Apart from pragmatic reasons, I'd argue that the terminological choice is warranted by Plato's commitment to set them apart as a group from the other heavenly bodies. As we will see in more detail in Section 5.1, Plato distinguishes the fixed stars from the 'wandering stars' in terms of their motion and the related function and the Sun and the Moon are not different from the five traditional planets in either respects. The widespread preference to focus on the revolutions of the Sun and the Moon as temporal markers is considered a form of ignorance about the other five that only a few astronomers overcame (39c5-7). It is for this reason, presumably, that Plato coins a variety of labels to refer to them collectively: 'the stars that have turnings' (39d7-8), 'the stars that wander' (40b4-8), 'the instruments of time' (42d5, 41e5). According to my interpretation, using 'planets' to refer to the seven heavenly bodies serves the purpose of capturing what is most significant about them as a group, i.e. their similar motion and collective function, which as we will see, are crucial to the creation of time.

[216] Vlastos 1975, *fn.* 19. Cf. Arist. *De Cael.* 291b29-292a9.

Ch. 5: On the planets

Despite being treated as a distinct group in the *Timaeus*, the seven planets belong to the species of heavenly gods. A general account of their nature as heavenly gods is provided at 40a2-40d5: they are one of the four kinds of living beings that inhabit the cosmos and they are defined by one of the four elements, which mainly constitute their body, i.e. fire. As we will see below, the fact that planets have fiery, and thus intrinsically visible bodies is important for the account of time.

It is not only fire, among the elementary bodies, that manifests itself in the visible domain, as all the elementary bodies are visible (πῦρ δὲ καὶ ὕδωρ καὶ γῆ καὶ ἀὴρ σώματα πάντα ὁρατὰ γέγονεν, 46d6-7). Nonetheless, all the other bodies seem to depend on being mixed with fire to possess their visibility, as Plato suggests by stating that "nothing could ever become visible apart from fire" (χωρισθὲν δὲ πυρὸς οὐδὲν ἄν ποτε ὁρατὸν γένοιτο, 31b1). What is more, the fire involved in the making of the heavenly bodies stands out among the elements because of its visibility. Timaeus states that the Demiurge made the heavenly bodies "mostly out of fire, to be the brightest and fairest to the eye" (τοῦ μὲν οὖν θείου τὴν πλείστην ἰδέαν ἐκ πυρὸς ἀπηργάζετο, ὅπως ὅτι λαμπρότατον ἰδεῖν τε κάλλιστον εἴη, 40a2-4).

In agreement with the general definition of the heavenly gods, there are several passages highlighting the special visibility of their bodies. The most obvious passage is the one on the teleologically determined function of the eyes, needed to study the heavenly bodies and the heaven itself, and, because of them, to the night and day, months, year, equinoxes and solstices (ἰδόντων, ὀφθεῖσαι, 47a4-5). Even at the end of the discussion of the heavenly bodies and their revolutions it is pointed out that their changing configurations, being so complex, are best studied with a visible model representing their visible motions (ὄψεως, ὁρα, 40d2-4). Focusing on the most visible of all heavenly bodies, namely the Sun, it is established that the light (φῶς, 39b4) it casts makes the Sun visible through most of the heaven (φαίνοι τὸν οὐρανὸν, 39b6), and the resulting daylight is presented as an inherently visible body, made of the purest particles of fire (τοῦ πυρὸς ὅσον τὸ μὲν κάειν οὐκ ἔσχε, τὸ δὲ παρέχειν φῶς ἥμερον, οἰκεῖον ἑκάστης ἡμέρας σῶμα ἐμηχανήσαντο γίγνεσθαι, 45b4-6; πῦρ εἰλικρινὲς, b7).[217]

[217] Cornford discusses different options for the translation of the passage and argues that by taking οἰκεῖον ἑκάστης ἡμέρας σῶμα together we have the most plausible reading, in which the body is the daylight as a whole, that later withdraws and causes nightfall. Consequently, Cornford translates the passage as follows: "such fire as has the property, not of burning, but of yielding gentle light, they contrived should become the proper body of each day" (Cornford 1937, p. 152, *fn.* 2). There could be additional evidence for the daylight as a body spreading in many places at once in the *Parmenides*. The young Socrates proposes the day as analogous to the forms in being one and also in many places at once (οἷον [εἰ] ἡμέρα [εἴη] μία καὶ ἡ αὐτὴ οὖσα πολλαχοῦ ἅμα ἐστὶ, *Prm.* 131b3-c8). In Reginald Allen's reading, Parmenides' objection is legitimate, given that the day is nothing else that the sunlight shining in the heaven and on Earth and can be compared to a sail laid down on many places (Allen 1998, pp. 131-33).

The especially visible nature of the heavenly bodies matters for my enquiry because the visibility of the planets, in particular, is crucial to their function as instruments of time. I argued that time, in Plato's conception, is a cosmic phenomenon, where 'phenomenon' aptly captures the definition of time as an *image* (εἰκὼ κινητόν τινα αἰῶνος, 37d5, αἰώνιον εἰκόνα, d7), contrasted with αἰών, the *intelligible* and unitary life of the model. At the end of this chapter I will put forth the additional claim that the visible appearance of the planets accounts for time being an image. In the following three sections I will set out how the planets' visible bodies and intelligent souls are involved in the creation of time. I first address the difference between the planets and the fixed stars (Section 5.1) and then discuss the account of planetary revolutions provided by Plato (Section 5.2). Finally, I propose an interpretation of planetary revolutions as fulfilling their function by conforming to the cosmic periods and, in that very activity, collectively creating a cosmic image of αἰών (Section 5.3).

5.1 The difference between the planets and fixed stars

The planets are widely recognised in the literature on Plato's account of time as playing a crucial role in the creation of time (see Section 1.1). Many scholars, however, maintain that the fixed stars too are involved in that same creation.[218] In this section I will argue that textual evidence heavily suggests that planets indeed have a special part to play in the creation of time, while the fixed stars do not.

The separate introduction of the two groups already suggests a division of labour between the heavenly bodies. An entire third of the account of time is dedicated to the creation of the planets and the setup of their revolutions (38c3-39b2). From the very beginning it is clarified that *those* seven heavenly bodies are begotten for the sake of the generation of time: "in virtue, then, of this reasoning and design aimed at the generation of time, the Sun, the Moon and five other stars – 'wanderers' as they are called – were brought about for the begetting of time" (ἐξ οὖν λόγου καὶ διανοίας θεοῦ τοιαύτης πρὸς χρόνου γένεσιν, ἵνα γεννηθῇ χρόνος ἥλιος καὶ σελήνη καὶ πέντε ἄλλα ἄστρα, ἐπίκλην ἔχοντα πλανητά, 38c3-6). The claim is restated a few lines later, this time stressing that the creation of time is a result attained through a collective effort of all the planets (συναπεργάζεσθαι χρόνον, 38e4-5).

What is more, the planetary revolutions are presented as being directly responsible for the creation of the parts of time. The revolution of the Sun and the Moon are responsible for the generation of the day and night, of the month and of the year (πορεύοιτο, κεκλήκαμεν,

[218] Vlastos 1975, pp. 34-36, Brague 1982, p. 52.

περιελθοῦσα, ἐπικαταλάβῃ, περιέλθῃ 39b4-c5), and they are earlier introduced as the (most familiar) parts of time (37e1-3). A few lines later, the discussion includes the other five planets, leading to the general claim that "time really is the wanderings of the planets" (χρόνον ὄντα τὰς τούτων πλάνας, 39d1). The same statement is differently put in the concluding recapitulation, when it is again stated that the stars that have turnings (τῶν ἄστρων πορευόμενα ἔσχεν τροπάς), namely the planets, are responsible, through their motion, for making the heaven as much as possible resembling the αἰών-ly nature of the model (ὡς ὁμοιότατον ᾖ τῷ τελέῳ καὶ νοητῷ ζῴῳ πρὸς τὴν τῆς διαιωνίας μίμησιν φύσεως 39d7-e2). The last two passages, in particular, leave no doubt that the revolutions involved in the 'chronogony' are those of the planets.

On the other hand, the fixed stars are only introduced after the account of time is concluded, as (by far) the greater group of heavenly bodies (39e10-40a2). Once more, Timaeus informs us that they are a separate group from the planets, as the latter ones are referred to as 'the stars having turnings and wandering' (τὰ δὲ τρεπόμενα καὶ πλάνην τοιαύτην ἴσχοντα, 40b6-7), while the fixed stars do not wander and have a single forward motion (ὅσ' ἀπλανῆ τῶν ἄστρων). Finally, it is emphasised once more that the planets had a separate generation (κατ' ἐκεῖνα γέγονεν, b7-8), at least insofar as the narrative is concerned.

Just a few lines later, the Earth is mentioned too, although it does not strictly belong to either group, not having any forward motion. Plato clarifies that it is the eldest of all the heavenly gods (πρώτην καὶ πρεσβυτάτην θεῶν ὅσοι ἐντὸς οὐρανοῦ γεγόνασιν, 40c2-3), and this remark, analogous to the one about the seniority of the cosmic soul compared to the cosmic body, suggests that we should take the claim that the Earth is the first heavenly body literally (38d1, d3, 39b4). Hence, the Earth would be the first created heavenly body, followed by the planets and, finally, by the other heavenly bodies. Whereas the Earth is not as essential to the project of creating time as the planets, it does play a part in the creation of time, as without it there would be no night alternating with the day, and time would be, if only slightly, differently structured (φύλακα καὶ δημιουργὸν νυκτός τε καὶ ἡμέρας ἐμηχανήσατο, 40c1-2).[219] Overall, Plato's lengthy discussion of the disposition and motion of the planets, together with the mention of the Earth puts emphasis on the absence of any reference to the fixed stars.

[219] Even if the Earth seems to partake in some of the defining functions the planets carry out, the Earth plays a different function. I will argue that the contribution of the Earth amounts to being a fixed obstruction for the projection of daylight throughout the universe, hence allowing the Sun to better mark out nights and days in their alternation. The periodical absence of light provides us in particular with the best visible stimulus to get acquainted with number (39b2-7). The function of the Earth, insofar as time is concerned, then, seems to be restricted to make the coming and going of the sunlight more apparent. The hypothesis, then, is that the contribution of the Earth does not warrant that it is strictly necessary for the creation of time, as it is the case for the planets, thus explaining why it is only discussed with the other heavenly bodies. The peculiar 'winding' motion of the Earth, which I won't address here, is comprehensively discussed in Cornford and Zeyl (Cornford 1937, p. 120-134; Zeyl 2000, pp. xlix-l).

Even when one would expect the fixed stars to play as crucial a role as the planets, i.e. in creating a unit of measurement by moving along the circle of the Same, at 39b2-c2 there is no sign that Timaeus considers them as the source of that unit. The measure for the circle of the Same, i.e. the night-and-day, is in fact created by having the Sun casting a more intense light than any other heavenly body. As Vlastos points out, the Sun is not the best measure to adopt, because, unlike the fixed stars, it does appear earlier and later throughout the year.[220] Yet, Plato introduces only the seven planets as candidates for that role, showing a clear intention to assign to the planets, and not to the fixed stars, an essential role in the creation of time. Moreover, Bowen points out that in the whole astronomical account proposed by Plato the focus is on the changing configurations *between the different planets*, described by Plato as a heavenly race, and not on the changing relation between each of the planets and the fixed stars in the background.[221]

To conclude this overview, it should be noted that the function of the fixed stars is also mentioned as part of the account that concerns them, and yet there is no reference to the creation of time. The reason why the fixed stars are made and given only a single forward motion along with the circle of the Same is to make them as excellent as possible (ὅτι μάλιστα αὐτῶν ἕκαστον γένοιτο ὡς ἄριστον, 40b3-4) and to truly adorn, in a wordplay, the cosmos as a whole (κόσμον ἀληθινὸν αὐτῷ πεποικιλμένον εἶναι καθ' ὅλον, 40a6-7). The role of fixed stars, unlike that of the planets as instruments of time, consists in completing the cosmos by filling and adorning it as one of the four species. The difference in motion, contrasted with the 'wandering' of the planets, follows from a difference in function.

Even when the totality of the heavenly gods is considered, in their relation to the immortal parts of the souls created for human beings, a division of labour between the two groups of heavenly bodies might be suggested. Firstly, we learn that the immortal souls are as many as the

[220] "Plato appears to be talking a though the period of the diurnal revolution of the sun – the solar day – were *identical* with the movement of the Same, while his theory requires it to be a little shorter: in the sun the movement of the Same is retarded, being counteracted by the *inverse* movement of the Different. Only in the fixed stars, which are totally exempt from the latter movement, could the period of the diurnal revolution be precisely identical with the movement of the Same" (Vlastos 1975, p. 100). As Vlastos points out, the usage for calendaric purposes among Greek astronomers at the time accepted the Sun's daily revolution as the basic unit of measurement for comparing months and years (Vlastos 1975, pp. 100-101).

[221] "The early Greeks distinguished stars that seem fixed in relation to one another and those that were not fixed in this way but appear to wander. They were also aware that these wandering stars or planets have diurnal and sidereal motions. But, so far as I can tell, this was pretty much the full extent of their knowledge of planetary motion. Symptomatic of this was, I submit, their tendency to analyze the eastward motions of the planets in relation to one another and not in relation to the background of the fixed stars. Their image for this was drawn from the race-course […]. It is important to see that nothing in this metaphor implies or demands that Mercury and Venus make stations and retrogradations. That is, the imagery no more entails this than, for instance, falling behind in a footrace and then catching up and going ahead entails really stopping, going backwards, stopping, then racing forwards, or even appearing to do any of these things against the background of stationary spectators. All the image requires is a sense of the overall eastward direction of the race, and this itself may have been inferred from the fact that the planets rise later and later in relation to the fixed stars over the course of time" (Bowen 2002, p. 158).

number of the *stars* (συστήσας δὲ τὸ πᾶν διεῖλεν ψυχὰς ἰσαρίθμους τοῖς ἄστροις, 41d8) so that each soul is carried by a star across the universe to be taught about its nature before ever being born. Secondly, those immortal souls are sown in the planets and the Earth, that are collectively referred to as instruments of time (τοὺς μὲν εἰς γῆν, τοὺς δ' εἰς σελήνην, τοὺς δ' εἰς τἆλλα ὅσα ὄργανα χρόνου, 42d4-5).[222] More will be said in Section 5.3 on the expression 'instruments of time' and how it clarifies the relation between the planets and time. For now, it is sufficient to note that the two steps in the cosmic odyssey of the immortal souls plausibly correspond to two groups of heavenly gods – the fixed stars in the first, and the instruments of time (the planets plus the Earth) in the second. In fact, while it is true that 'stars' of the first step might in principle include the planets, the 'wandering' motion and position within the cosmos distinguishing the planets from the fixed stars would rather suggest that even in this respect they play different roles.

My conclusion is that there is sufficient textual evidence to claim that only the seven planets (with the limited contribution of the Earth) play a role in the creation of time. It is not methodologically promising to take Plato to implicitly suggest what he never explicitly claims in the *Timaeus*, simply because we deem the alternative to be *prima facie* unreasonable. The only support for the inclusion of the fixed stars in the creation of time is that, from our contemporary point of view, there is no reason why they shouldn't play the same function as the planets in that regard, given that they are even more precise temporal markers of the apparent motions in the sky. Our interpretative effort, however, should rather entertain the opposite hypothesis, namely that there is something specific about the planetary revolutions that justifies, in Plato's judgement, a distinct function, as the text strongly suggests. Although my whole interpretation of the account of time does not hinge on this conclusion, I will provide a hypothetical explanation for separating the planets from the fixed stars with regards to their function in Section 5.3.

Now that I have examined the distinction between the two groups of heavenly bodies, and presented the evidence for the special connection between the planets and time, I will focus in the next two sections on the analysis of the two components by which planets are defined as a distinct group of heavenly bodies: their 'wandering' motion (in Section 5.2) and their function (in Section 5.3).

[222] Both Cornford and Taylor identify the instruments of time with the Sun, the Moon and the other five planets (plus the Earth). It seems then, that the distinction in the two steps fittingly corresponds to the distinction between the fixed stars that lie at the extremity of the cosmos and those other heavenly gods, the Earth and the planets, which lie within the cosmos (Cornford 1937, pp. 142-147; Taylor 1928, pp. 255-256). Earlier in the dialogue the planets are described collectively as 'instruments of times' (41e5, ὄργανα χρόνων). Brague highlights the discrepancy between the singular and plural of χρόνος as a significant one, arguing that each planet is primarily attending to a certain temporal sequence, corresponding to the part of time associated with it. However, they are all ultimately instruments of the singular time, that is an enumerable phenomenon of the heaven as a whole (Brague 1982, pp. 62-63).

5.2 The planetary revolutions

As the previous section showed, what defines the planets as a group is their motion, described as πλάναι, wanderings. Their collective motion, so defined, is eventually *identified* with time, at 39d1. As argued already in Section 1.1, my reading takes this claim at face value, as a genuine feature of Plato's account. The wanderings of the planets are that which the definition of time describes. The identity claim should then be rephrased, in Plato's own words, as follows: 'the wanderings of the planets imitate αἰών and revolve according to number'; or, to use the terminology of structure and content developed in Chapter 4, 'the wanderings of the planets are identified with the compound of content and structure, where the former consists in the periods of the cosmic soul and the latter in the temporal structure'. This being the thesis I am arguing for, the first step in the enquiry will be to discuss Plato's account of the planets' wanderings.

Plato emphasises repeatedly in the *Timaeus* as well as in the *Laws* that planetary motion is not a real wandering in the sense that it happens by mere material necessity. The planets are gods exactly like all the other heavenly bodies, and their revolutions follow a *regular* pattern which has its ultimate cause in their intelligent nature.[223] There is however a second, more poignant sense, of 'wandering' that assesses the complexity of motion, in terms of how many directions a living being moves in. For instance, the sort of motion attributed to the cosmos is the only motion entirely free from wandering, insofar as it only rotates around itself (τὰς δὲ ἓξ ἁπάσας κινήσεις ἀφεῖλεν καὶ ἁπλανὲς ἀπηργάσατο ἐκείνων, 34a1-5). The fixed stars rotate around themselves, like the cosmos, and are also free from any of the wandering kinds of motion, except for the forward revolution towards the right, dominated by the circle of the Same. As such they have the minimal degree of wandering among the living beings within the cosmos.

The planets' motion is explicitly described as wandering (they are, after all, πλάνητες), so it is natural to assume that their motion is the closest, among the heavenly bodies, to the motion of mortal living beings. These move in all six directions, at different times, hence being maximally wandering (πλανώμενα, 43a6-b5; 44d8). In particular, the wandering of the planets consists in the fact that they alone among the heavenly bodies have a *twofold revolution*: while they are dominated by the circle of the Same just as the fixed stars, hence moving westward, they also have each a unique eastward motion along the circle of the Different on which they are placed (διὰ τῆς ταὐτοῦ φορᾶς ἰούσης τε καὶ κρατουμένης, 39a1-2). In fact, the planets are placed by the Demiurge each on one of the seven sub-circles of the Different, and they move in accordance with it (κατὰ δὴ τὴν

[223] Ἄστρων δὴ πέρι πάντων καὶ σελήνης, ἐνιαυτῶν τε καὶ μηνῶν καὶ πασῶν ὡρῶν πέρι, τίνα ἄλλον λόγον ἐροῦμεν ἢ τὸν αὐτὸν τοῦτον, ὡς ἐπειδὴ ψυχὴ μὲν ἢ ψυχαὶ πάντων τούτων αἴτιαι ἐφάνησαν (899b3-6). Cf. *Ti.* 39c5-d2, *Lg.* X 822a4-8.

θατέρου φορὰν, 38e6). Moreover, in virtue of being associated with the motion of the circle of the Different, the planets are moving at different velocities, except for the Sun, Mercury and Venus (36c8-d7).

Finally, the visible result of the twofold revolution is that, unlike with the constellations composed by the fixed stars, planets change their position in the sky relative to one another. The changing configurations of their visible bodies are famously described as a race at 38d4-6 (καταλαμβάνουσίν τε καὶ καταλαμβάνονται), presenting Venus and Mercury overtaking and being overtaken by the Sun, and at 39a2-b2 (καταλαμβάνοντα καταλαμβάνεσθαι), highlighting that the overtaking between planets makes some of them appear faster than others, whereas the opposite is the case. Similarly, in accounting for the completion of the month, the Moon is described as overtaking the Sun (σελήνη περιελθοῦσα τὸν ἑαυτῆς κύκλον ἥλιον ἐπικαταλάβῃ, 39c3-4).

However, because of the complexity of their configurations, planetary revolutions involve certain components which Plato describes as turnings, juxtapositions, back-circlings and so on (τροπάς, 39d8; τρεπόμενα, 40b6; ἐπανακυκλήσεις, προχωρήσεις, ἔν τε ταῖς συνάψεσιν, κατακαλύπτονται, ἀναφαινόμενοι, 40c3-7).[224] These have been generally taken to describe what is also visible to us today, namely the peculiar trajectories of the planets across the sky. However, in attempting to reconcile the apparent image of planetary motion we are familiar with and Plato's 'twofold revolution' account, the literature faces several interpretative issues.[225]

Vlastos, for instance, points out that while the twofold revolution is a good explanation of the changing position of the Moon and the Sun, it cannot explain the variations in the trajectories of the other five. The alternative, then, has been either (a) to take Plato to use the terminology of 'turnings' and other sorts of variations as a further component of their motion, over and above the two regular revolutions, or (b) to assume that Plato's account is intentionally left incomplete.[226]

[224] However, the interpretation of each of these astronomical terms associated with planetary revolutions is itself part of the debate and for instance, Bowen criticises the usual translation of *epanakyklḗseis* and *prochōrḗseis* (Bowen 2001).

[225] For the purposes of the present discussion, I mainly refer to Alan C. Bowen, David L. Guetter, Wilbur R. Knorr and Gregory Vlastos' reconstructions of Plato's account of planetary revolutions, and their substantial disagreements (Vlastos 1975, Knorr 1990, Bowen 2002, Guetter 2003). A comprehensive summary of the main exegetical issues can be found in Donald J. Zeyl's commentary (Zeyl 2000 pp. xliv-xlix). Goldstein and Mendell are important sources to consult for an assessment of the relation between Plato and the important astronomers of his time, such as Eudoxus (Goldstein – Bowen 1983, Mendell 1998).

[226] Vlastos, for example, argues that Plato's incapacity to account for all the wanderings of the planets is explained by the fact that Plato's account was meant as a prototype for a more elaborate astronomical account and was not meant to be complete (Vlastos 1975, pp. 58-61). However, I would hold that the account as outlined in the *Timaeus* is only considered incomplete in the sense of lacking a more detailed account for each planetary revolution. It does look as if the author thought that all the basic theoretical commitments needed to account for the details have been already laid out. If Plato had been aware that his account was incapable of fully accounting for the heavenly phenomena, presumably he wouldn't have outlined it with the confidence that is shown by Timaeus' words. Timaeus only postpones the explanation of the details and specifies that he does so for merely pragmatic reasons (38e, 40c-d).

For those arguing for (a), the focus of the discussion is on two passages: (1) "The Dawnbearer (the Morning Star, or Venus) and the star said to be sacred to Hermes (Mercury) he set to run in circles that equal the Sun's in speed, though they received the power contrary to its power (τὴν δὲ ἐναντίαν εἰληχότας αὐτῷ δύναμιν)" (38d2-4); (2) "For as it revolves, this movement gives to all these circles a spiral twist (πάντας γὰρ τοὺς κύκλους αὐτῶν στρ-έφουσα ἕλικα διὰ τὸ διχῇ κατὰ τὰ ἐναντία ἅμα προϊέναι), because they are moving forward in two contrary directions at once" (39a5-b2).

The wide consensus concerning the interpretation of (2) is that the spiral twist described has its origin in the twofold revolution, as described in 36d4-7.[227] However, as Cornford's 'third force' hypothesis and Knorr's 'wobbling' hypothesis suggest, the twist might indicate an additional component to the planets' motion, over and above the twofold regular revolution, that has its origin in the planets themselves. This claim is usually linked to the attribution of a contrary power, mentioned in (1), to Venus and Mercury, which might explain their apparent accelerations and decelerations.[228] The uncertainty on how complete was the knowledge of heavenly phenomena of the Greek astronomers of the time, and thus on how complex a phenomenon they had to account for in the first place renders any hypothesis speculative. However, if we consider for instance the course of Venus and Mercury, it visibly deviates from the one followed by the Sun and, given that their cosmic circles are said to be uniform at 36d6 (τάχει δὲ τρεῖς μὲν ὁμοίως), the indication that the planets themselves have contrary powers seems significant. Plato might have intended to explain further complexities of planetary revolutions as due to the individual planet being responsible for the additional kinetic component to the overall trajectory.[229]

Connected to this point, a more general exegetical question arises. There is in fact a way of reading Plato's account that takes the planets to be entirely passive in their revolutions, i.e. simply dragged around by the regular periods of the cosmic soul. A second way of reading the passages takes instead the planets to be actively responsible for their course along the cosmic circles, independently of whether they add additional motions to the twofold revolution. The text is once

[227] Guetter is the only one who argues against the consensus on this passage that the use of τἀναντία in the passage does not mean that the circle of the Different and the circle of the Same move in contrary directions. So, he argues, for Plato the eastward motion is only apparent, because the circle of the Different is slower, on average, than the circle of the Same. It seems to me that Guetter is ignoring Timaeus' assumption, explicitly stated at 39a1-2, that the circle of the Same carries with it not only the fixed stars but also the planets, and that, as a consequence, to explain their retrogradation, a motion in the opposite direction, i.e. eastward, is necessary, to account for the planets being 'left behind' (Guetter 2003, pp. 198-203).

[228] Cornford 1937, pp. 106-112; Knorr 1990, pp. 316-317.

[229] In the *Epinomis* (986e2-7), Venus and Mercury are also described as following the lead of the Sun in virtue of its intelligence. Moreover, their velocity is said to be almost equal to the Sun's (τάχει μὲν ἡλίῳ σχεδὸν ἴση), but they are as a whole neither faster nor slower (οὔτε βραδυτέρα οὔτε θάττων τό γ' ἐπίπαν), suggesting that they are left behind and then they catch up, as in the heavenly race described above.

more ambiguous on this, although certain hints might support the ascription of *active* motion to the planets.

Ascribing a 'contrary power' to the planets themselves, as in (1), and not describing the phenomenon as extrinsically determined seems to imply that at least Mercury and Venus have autonomous agency in affecting their own trajectory. On the same note, the description of the planets moving in accordance with (κατὰ δὴ τὴν θατέρου φορὰν) the circle of the Different could be contrasted with the dominating power of the circle of the Same (κρατουμένης) that drags them around. In the latter case, in fact, it is the circle of the Same that is explicitly presented as the one responsible for the planetary revolutions along its trajectory, even teaching human beings about number *through them* (μαθόντα παρὰ τῆς ταὐτοῦ καὶ ὁμοίου περιφορᾶς, 39b7-c1). It might well be that the different description entails that the circle of the Different has no similar domination upon them, and it is their active task to conform to the overall course of that circle in their motion.

Finally, the planets are described as intelligent and divine living beings, devoted to accomplishing a specific task. That specific task is in fact taught to them, and them only, by the Demiurge (38e6, ἔμαθεν). Moreover, the pursuit of that task will make them guardians (φυλακὴν, 38c6) and dancers (χορείας, 40c3) – both activities that intuitively involve actions of the body guided by one's own intelligence, hence suggesting the attribution of agency.[230]

However, the supporter of the 'active' interpretation should address at least one objection, stemming from the emphasis given to the fact that the planets are first described as lifeless *bodies* set in motion and only later animated by a soul. The importance of their revolutions as revolutions of bodies is emphasised twice in the text, when their creation is described and when they are animated (σώματα δὲ αὐτῶν ἑκάστων ποιήσας, 38c7; δεσμοῖς τε ἐμψύχοις σώματα δεθέντα ζῷα ἐγεννήθη, 38e5-6). One could argue that, given the description of the planetary revolutions, it must be possible that they are carried out by a lifeless body set in motion by the Demiurge, at least at the beginning, therefore requiring that their revolutions are just the result of being subject to the course of the two cosmic circles. However, one could point at the same exact process taking place for the

[230] As Karel Thein points out, if the planets did not have a part to play, all the Demiurge would need is to fix them to those circles, certainly not to give them life and instructions (Thein 2015 p. 10, *fn.* 15). The treatment of dance in the *Laws* makes it seem as if the dancer, by learning the appropriate skills, has the capacity to make, among other things, its own motions rhythmic, that is, 'according to an arrangement', just as the planets seem to do: "Whereas animals have no sense of order and disorder in movement – 'rhythm' and 'harmony', as we call it – we human beings have been made sensitive to both and can enjoy them. This is the gift of the same gods whom we said were given to us as companions in dancing" (*Lg.* 653e3-654a1), and later on "Order in movement is called 'rhythm', and order in the vocal sounds—the combination of high and low notes—is called 'harmony'; and the union of the two is called 'a performance by a chorus'" (664e8-665a3). Interestingly, according to the *Symposium*, rhythm is generated when fast and slow are brought to a concordance from their previous discordance, in a very *Philebus*-like fashion (187c).

yet not ensouled cosmic body, at 34b, despite the later attribution of agency to the cosmic soul over the cosmic body and everything within.[231]

Moreover, if, as argued above, the planetary revolutions are more complex than the 'twofold revolutions' account would suggest, the 'passive' interpretation would also struggle to explain those extra movements as having their origin in the two circles of the cosmic soul. In fact, it would have to argue either that the speed of the circle of the Different itself varies, or that the additional turnings of the planets are a purely 'mechanical' consequence of the two circles of the cosmic soul dragging them around.[232]

In conclusion, textual evidence overall speaks in favour of the autonomous nature of the planetary revolutions along the circle of the Different. While my interpretation in the following sections relies on this claim only minimally, I would hold that the planets are responsible for their own motion along the circle of the Different. In fact, although planets ultimately conform to the period of the circle they are on, more complex patterns of motions would be more easily accountable for while maintaining the core of the 'twofold revolutions' account, as planets would be so instructed by the Demiurge in the pursuit of their task.[233]

What remains unquestionable for Plato is that, however complex, the planets display the same patterns of motion again and again, succeeding in completing each revolution in exact coordination with the period of the Different with which they are associated. In fact, as we will see, the commensurability of the planetary revolutions hinges on the fact that the periods of the circle of the Different are all commensurable in a ratio, despite their different velocities (ἐν λόγῳ δὲ φερομένους, 36d6-7). If planets were not mirroring the circular motion of the cosmic circles, nothing would warrant the commensurability of their revolutions (39c5-7).

My argument so far has not yet explained why Plato claims that planetary revolutions are identical with time. By postponing twice the enquiry into the details of the account of planetary revolutions to a later time, as a digression on the subject-matter (38d6-e1, 40d2-3), Plato is also

[231] Mohr proposes an extensive discussion on the issue of 'setting in motion', arguing that in the *Timaeus* the cosmic soul is not meant to have a self-moving capacity, unlike in earlier Platonic dialogues, and that its function is simply that of a preserver of ordered motion that has been externally originated (Mohr 1985, pp. 171-177). This could be generalised to all heavenly gods, and hence to the planets' souls.

[232] The only way to justify a divergence in motion between the cosmic circles and the planets on the 'passive' interpretation would be to account for the spiral twist as originating from a turbulence caused by the contrary revolutions that the planets' bodies carry out. While Knorr and Guetter's accounts do not necessarily commit them to one reading over the other, their wobble-factor, or oscillation could work as an attempt at explaining the motions of the cosmic soul and how they determine the course of the planets (Knorr 1990, Guetter 2003). As Guetter rightly remarks, Plato needs the seven sub-divisions on the circle of the Different to be able to account for the great diversity of velocities and patterns exhibited by the planets, and as such that circle is consistently employed to explain the variety of motions, as opposed to the universally shared revolution along the circle of the Same (Guetter 2003, pp. 198-199).

[233] The hypothesis of cosmic circles and heavenly bodies moving at the same speed is considered redundant in Aristotle's *De Caelo*, as he ends up arguing that the motion of the heavenly bodies is entirely extrinsic, and that they are at rest, fixed on the heavenly circles, and passively carried along (II, 8 289b8-290a6).

making the point that the details about planetary revolutions are not crucial to complete his enquiry on time. In order to advance our understanding of the connection between planets and time we need to understand why, in moving as they do, planets fulfil their function as 'instruments of time'.

5.3 The function of the planets

As seen in Section 5.1, there is overwhelming evidence that the planets are introduced as means to accomplish a certain result, i.e. the creation of time, and they do so through their 'wanderings', analysed as a twofold revolution along the circles of the cosmic soul. To further advance our understanding of the specific function the planets play in relation to time, we have to consider once more the framework of structure and content and articulate how the planets fit in it.

In Chapter 4, we established that the living motion of the cosmos, articulated in the eight periods of the cosmic soul, is the *unstructured content* for the creation of time. As I pointed out, once the cosmic living motion instantiate the temporal structure ('according to number') time is created, as the unified content-structure compound. Now, it seems that, because the planets are involved in the creation of time, in this reading they must, as instruments, be the ones carrying out the instantiation of structure in content, so that their revolutions are *identified* with the compound of the two. However, it is not yet clear how the planets would yield such a result, since their relationship with the structure and content of time has not been addressed. My analysis of the function of the planets will involve three steps: firstly, I will suggest a reading of the notion of 'instrument' in Plato's work; secondly, I will apply it to the case of the planets, as instruments of time; finally I will establish how their nature as instruments should be articulated in the content-structure framework.

There are many instances of ὄργανα in Plato's dialogues, some analogical in meaning and some more straightforwardly referring to artefacts, such as musical instruments. For the purpose of this discussion I will present some examples that are significant in outlining the common characteristics defining what an instrument is in general terms. A very familiar case of the analogical use of the term is the use of 'instruments' as an the epithet for sense-organs or organs in general.[234] The representation of a soul-body relation as instrumental is, after all, an important part of Plato's dualist view, and, among the most explicit passages elaborating on it, in the *Theaetetus*

[234] The use of ὄργανον for the bodily parts responsible for sense-perception is very widespread in Plato. It appears three times in the *Timaeus* (33c4, 45a7, 45b2). Moreover, Plato already has instances in the *Republic* (τῶν περὶ τὰς αἰσθήσεις ὀργάνων 508b), and rather extensively in the section dedicated to perception in the *Theaetetus* (184a-185c). As we will see, however, it is also used at 33c4, implying that organs are, in general, any part of the body employed by the soul to interact with something external to itself, hence the reason why the cosmos is 'organ-less'.

we find Socrates distinguishing between the soul, as the ultimate perceiver, and the bodily instruments that the soul use in order to have access to objects of perception. In this case, the *instrument*, a bodily medium for the soul to have perception of external objects, is distinct both from the *agent*, that is the soul, and from the perception, which arguably is the intended *result*.[235]

In the *Symposium*, the satyr Marsyas is contrasted with Socrates: Marsyas can cast spells on his audience only with the aid of musical instruments, whereas Socrates just employs words to charm his audience. The opposition described by Alcibiades is between an agent that can only provide to his words their 'spell-casting' nature with the help of an instrument producing melodies and Socrates, who manages to cast a spell only with words.[236] Despite the more and less literal use of 'instrument', we can see how consistently there are three components defining something as an instrument: the instrument is (1) a means, natural or artificial, (2) that is employed by an agent, and (3) has the function of achieving an intended result.[237]

Given the general framework for instruments, we might wonder why planets are classified as instruments of time, and what are the result and the agent, in their case, such that the considering them as instruments is justified. The first question, concerning the intended result of the instruments of time, has been addressed already from the beginning of the chapter, and it is straightforwardly answered by the genitive χρόνου: the intended result for which the planets are made is the creation of time. However, it is much less straightforward to determine who would be the agent employing the planets to attain that result. For the moment I shall not consider what I take to be an implicitly widespread interpretation of the agents using the planets, which corresponds to the 'cosmic clock' interpretation discussed in Section 1.2. If we understand the planets as just a clock, the agents would be human beings employing the planets for the result of *measuring* time. I will return to that interpretation in the Conclusion, to highlight the difference between that interpretation and my reading. For the time being, I will consider the other two likely candidates.

The first hypothesis takes the Demiurge to be the agent behind the instruments of time. If, as it seems natural, we take χρόνου to indicate the result yielded by the planets, as instruments, then it

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[235] The ultimate perceiver, argues Socrates, is "some single form, soul or whatever one ought to call it, to which all these [perceptions] converge—something *with* which, *through* those things (eyes and ears), as if they were instruments, we perceive all that is perceptible (ᾗ διὰ τούτων οἷον ὀργάνων αἰσθανόμεθα ὅσααἰσθητά)" (184d1-5).

[236] 215b-d. Such characterisation is maintained in other cases in which Plato explicitly refers to instruments of something – where the genitive makes explicit what the instrument is for, namely the result they are meant to accomplish. This is the case, for instance, with the instruments of war (πολέμων ὄργανα, *Lg.* 956a; τὸν πόλεμον ὀργάνοις, *La.* 181c-182c), referred to in the *Laws* and *Laches*. What such instruments are varies from armours to the suitable metals used to craft military equipment. The notion, however, suggests that those are the things that are needed in order for men to fight on the battlefield.

[237] Although most uses of 'instrument', analogical or otherwise, refer to material objects and to their use, there is a broader analogical function of 'instrument' that is potentially applicable to all sorts of means to end relations. For instance, in the *Republic* the rational part of the soul is compared to the eye as the instrument of purely intellectual understanding (518c), and words and arguments are the instruments of the philosopher (582d-e).

is also plausible to take the Demiurge as the agent using them to achieve that result. However, on this reading, Plato would take the Demiurge to be the agent only indirectly, in the same way as a craftsman would be with a mechanism that he had produced and set in motion. In fact, the result that the planets yield is in their wanderings, not merely by coming into existence, and, as we established in Section 5.2, that motion is plausibly carried out by the planets themselves. The instructions given by the Demiurge to the planets (38e6) and his later 'retirement' (42e5-6) once the work is done, strongly suggest that planets are peculiar sorts of instruments in that they are autonomously moving in accordance with the intentions of their creator. This, after all, would be in line with the characterisation of the Demiurge as a divine sort of craftsman, capable of crafting instruments that do not need an external agent, being agents themselves.

This leads to the second hypothesis: the planets are both instruments and agents. All in all, given that Timaeus describes the planets as ensouled, intelligent and in the process of carrying out a specific task, perhaps we should not take them to be used by an external agent, but rather as themselves, *qua* intelligent souls, being the agents behind the use of their bodies as instruments for the creation of time. This, as we have seen in the previous section, is also supported by various hints that the planets are directly responsible for most of their revolutions in the sky. In this picture, then, the planets would be instruments and ensouled, intelligent agents, set up as auxiliaries by the Demiurge to help him finish his work.[238]

My view is that the two hypotheses above are not exclusive, as the agents that yield the result in the case of the creation of time can be more than one. The plurality of agents is explained, I would argue, by Plato's understanding of time as crafted and yet essentially kinetic. As I pointed out in Chapter 4, since time is a kinetic imitation of αἰών, it is not something that is created once and for all, but rather its structure is progressively displayed in motion, both in terms of its parts and as a totality. Hence, there are two stages to its creation: while the Demiurge is a creator of time through the planets because he sets up the entire 'mechanism', including the planets' intelligence and task, it is only when the planets themselves start to attend to the progressive creation of time, by carrying out their revolutions, that time comes to be.[239] The planets, then, are best envisaged as intelligent 'proxies' left behind by the Demiurge to bring his work to completion according to the

[238] Given my discussion in Section 5.2, it should be noted that the cosmic soul would also be contributing in a minor way as an agent, insofar as it is nonetheless responsible for the planetary revolution along the circle of the Same.

[239] Brague makes a similar point, underscoring how the planets still have a task to accomplish, once the Demiurge is done with his crafting, and they continue, as instruments, to generate the moving image of αἰών: "La ressemblance est le résultat d'un processus de conquête, et non une propriété inhérente [...]. Le ciel n'est image de l'aïôn que dans la mesure où il ne cesse d'engendrer le nombre par le mouvement des corps célestes qui le rendent visible" (Brague 1982, pp. 60-61).

plan he devised. And yet, as we have seen in sub-section 4.2.2, their work as instruments in the creation of time is like Sisyphus', in that it never truly comes to an end.

5.3.1. The planets and the content of time

So far, the cosmos has been left out of the discussion, as it is neither an instrument of time, nor the agent (see Section 5.2). It comes to the foreground, however, when we focus on the result of the instruments of time, i.e. the creation of time. In Section 2.2, I argued that the creation of time is intermediate between stage 1 and 2 of the cosmogony in that while time is created by means of the planets, it is a feature of the whole cosmos. In particular, time is a cosmic phenomenon, that I interpreted as the structured totality of cosmic life (see Section 4.1). Cosmic life, articulated in the eight periods of the cosmic soul, has been identified as the content of time, to become structured in the creation of time. If so, however, the planets are instruments for the creation of time insofar as they instantiate the temporal structure into the eight periods of the cosmic soul. Then, the cosmos appears in the 'instrument' relation as that which the instruments of time modify as structure-creators, in order to bring about time as a result.

If the reading is correct up to this point, then, the planets' function and their 'wandering' motion can finally be connected in an adequate way. We established in Section 5.2 that planets fulfil their function by carrying out their twofold revolutions along the circles of the Same and the Different – so much so that their revolutions are identified with time. Identity with time, however, entails that planetary revolutions are identified with both the content and structure of time, as time consists in the compound of the two.

We should first focus on the identity with the content of time, as it gives crucial insight on the reason behind the 'wanderings' of planets. Their peculiar motion is in fact the result of a conformity that planetary revolutions collectively attain with the cosmic periods of both the Same and Different. If, say, the planets were to start moving differently from the cosmic soul and lose that conformity, in my reading they would also fail to be instruments *of time* because they would not succeed in making the *content* of time structured.

The identification of cosmic motion and planetary revolutions is also textually supported by the terminology for circular motion, equally employed to refer to the periods of the cosmic soul and the planetary revolutions. Let us consider the following terms, and their verbal correspondents: περίοδος, κύκλος, φορά and περιφορά. As far as I can see, περιφορά is used exclusively for the *rotations* of the cosmic soul or for the corresponding rotations in our head: 36d1, 38c7-8, 39c1 and 40b2 for the former, 47b8 for the latter. Analogously, it seems that φορά is mainly used in the

account of time to refer specifically to the *revolutions* of the planets, to contrast their forward motion on a circular path with a rotation on oneself: 38e4, 38e6, 39a1, 39a4, 39b4.[240]

However, when using περίοδος and κύκλος, Plato never clarifies whether the reference is to the planetary revolutions or the underlying rotations of the cosmic soul. Περίοδος, in particular, is used at first to describe the rotations or the circles of the cosmic soul, while it is later employed to describe planetary revolutions in the account of time.[241] The most significant passages to show the shift in their referent are 39b3-4 and 39d4-5, where the eight revolutions carried out by the planets as a group (τὰ περὶ τὰς ὀκτὼ φορὰς πορεύοιτο) are later referred to as the eight periods (ἁπασῶν τῶν ὀκτὼ περιόδων) measuring out the complete year. The passage at 47a1-c4 also shows a swift transition from the revolutions of the planets generating the parts of time (ἐνιαυτῶν περίοδοι) to the underlying cosmic rotations (τοῦ νοῦ κατιδόντες περιόδους), that are visible thanks to the planets. This suggests that the circular motion of the cosmos and that of the planets as a group are not distinct ones, even though for the seven planets that motion consists in a twofold *revolution*, whereas for the cosmos it is a twofold *rotation*: they follow the same path and complete each full circular motion at the same overall speed.

This hypothesis explains not only the way the planets move, but also their number, corresponding to the seven subdivisions in which the motion of the circle of the Different is articulated (σώματα δὲ αὐτῶν ἑκάστων ποιήσας ὁ θεὸς ἔθηκεν εἰς τὰς περιφορὰς ἃς ἡ θατέρου περίοδος ᾖειν, ἑπτὰ οὔσας ὄντα ἑπτά, 38c7-d1). The group of seven planets, I contend, has the exact number and position to collectively attain, in its twofold revolution, conformity with the cosmic periods.[242] In fact, the seven sub-circles of the Different are where the cosmic motion *as a whole* is

[240] The passage at 36c4-5 (τὴν μὲν οὖν ἔξω φορὰν ἐπεφήμισεν εἶναι τῆς ταὐτοῦ φύσεως) might support this reading, insofar as it defines the motion of the circle of the Same as a φορά that always takes place in the same place.

[241] Examples of the first use are 38c8, 39c2, 47b7, 47d3, 47d5 and 58a5; of the second are 39b5, 39c5, 39d5, 47a5. As for κύκλος, we have a number of references to either the circles of the cosmic soul themselves, and to their shape (36c1, 36c4, 36d2, 36d5, 36e2, 37b7, 37c1, 38d3, 39a6, 39d7 and 40a6), which, when planetary revolutions are concerned directly, is coupled with περιέρχομαι to describe the full revolution of the planet on the circle, i.e. a cycle (39c3, c5). A further level of ambiguity is added by the fact that περίοδος and κύκλος can signify both the circular path and the motion carried out along it, implying one or the other in different contexts (*LSJ s.v.* περίοδος, κύκλος). The considerations above do not presuppose that Plato is aiming, in the *Timaeus* or elsewhere, to be completely consistent and strictly technical in his vocabulary. Nonetheless, the variety of terms employed would generate ambiguity, if Plato meant to keep the planetary and cosmic motion distinct. The conformity of the two is then a way to justify Plato's terminological choice.

[242] The explanation concerning the motion and number of the planets needs be teleological in nature, since we are discussing the function for how things are arranged the way they are so that they are the best possible. Our enquiry starts from the visible revolutions of the planets, that are the empirically accessible phenomena, and the hypothesis of the corresponding eight periods of the cosmic soul follows. The teleological explanation, however, requires that we look at the same phenomena from the perspective of the creator, hence wondering for what function they were made for. In that perspective, the explanatory order goes the opposite way: the complexity of the cosmic soul comes first in both planning and crafting, so that the planets' function is seen as completing the prior creation of the cosmic soul and its periods. Notably, Timaeus does not provide a further teleological explanation for the way the soul is divided in exactly seven sub-circles of the Different having different velocities, which might suggest that Plato takes those features as a given fact about how well-structured souls are made.

manifested: both components of cosmic motion, along the ecliptic and along the equator, are expressed in the circle of the Different, as, in addition to its own seven periods, the circle also moves in accordance with the period of the circle of the Same.

Finally, the hypothesis offers a plausible reason for the exclusion of the fixed stars from any involvement in the creation of time, contrasted with the crucial role played by the planets. If the goal of the creation of the instruments of time is structuring the cosmic periods, to have those instruments revolving in conformity with *both* circles of the cosmic soul is a crucial condition to be structure-creators.[243] Revolving along with only one of the two circles, as the fixed stars do, is not enough, because in that way their motion conforms only to one component of cosmic motion and not to the whole of it. In this way, the motion of the fixed stars is not identical with the content of time, as is in the case for the planets, but only with part of it.[244]

5.3.2. The planets as structure-creators

The identity between the planetary revolutions and the periods of the cosmic soul (content of time) is not enough, in and of itself, to make the planets instruments of time. As suggested above, the planets must also be structure-creators, so that their 'wanderings' also display the temporal structure (κατ' ἀριθμὸν). The next part of the enquiry, then, should attempt to clarify how the planetary revolutions instantiate the temporal structure. What I propose in this sub-section is a first outline of my proposal, which will be developed in Chapter 6.

My main claim is that the content of time instantiates the temporal structure in virtue of the visibility introduced by the fiery bodies of the planets. As I noted at the beginning of this chapter, time is presented twice as an *image* (εἰκὼ, εἰκόνα), thus foregrounding its corporeal and visible nature as a cosmic phenomenon. To my knowledge, Remi Brague has been the first, at least among modern scholars, to acknowledge the crucial connection between the visibility of the heavenly

[243] There is a connected fact about the cognitive faculties of the two circles of the cosmic soul that might be relevant. The rotation of the circle of the Different is opposed in its cognitive function to the one of the circle of the Same at 37a6-c5. Importantly, the circle of the Different's intellection is about the things that come to be (37b2, b6-7), and among the aspects it enquires into there is the 'when' question (ὁπότε, 37b1). On the contrary, the circle of the Same seems to rule the whole cosmos from outside the heaven (36e2-4) and its intellection is directed exclusively to what remain always identical with itself, namely the purely intelligible kind (37c1-3). It seems that the epistemological function of the circle of the Different and its position as the inner circle of the cosmic soul (36c5) are connected so that to enquire into a certain object, the soul must be directly associated with it. Perhaps time must also be accessible, in Plato's assessment, by the circle of the Different, in its twofold rotation (the one it carries out and the one dominated by the circle of the Same), as time proceeds because the planets move along with that circle. For an account of the interaction between the cosmic soul and its corporeal objects of cognition, see Betegh 2018, pp. 128-133.

[244] The hypothesis might also explain why Plato does not include the Earth among the heavenly bodies responsible for the creation of time, despite it having a part to play in the resulting visible appearance (see *fn.* 220). The Earth, unlike the planets, passively stands still at the centre of the cosmos and does not conform to the cosmic periods.

bodies and the definition of time as a moving image of αἰών. In fact, he correctly points out that the visibility of the heavenly bodies is all that the Demiurge needs to add to the periods of the cosmic soul, in order to create time.[245]

Along the same lines, I also hold that the planets are instruments for the creation of time, insofar as they collectively constitute a kinetic *image* in their revolutions: on the one hand, that kinetic image conforms to the content of time in its motion, as seen in sub-section 5.3.1; on the other, it visibly displays a κατ' ἀριθμὸν structure, as we will see in Chapter 6. An important corollary to this claim is that, through the planetary revolutions, the content of time visibly displays a structure that was not there yet with the creation of the cosmic soul and the start of its periods. The κατ' ἀριθμὸν structure of time is a structure instantiated by means of visibility, so the invisible periods of the cosmic soul alone do not instantiate it.[246]

This reading, I will argue, fits with Plato's own definition of the planets' function at 38c5-6: "these are called 'planets', and they came to be in order to *delimit* and *guard* the numbers of time (εἰς διορισμὸν καὶ φυλακὴν ἀριθμῶν χρόνου γέγονεν)" (38c5-6).[247] I did not address the passage earlier in the chapter precisely because of its focus on the function the planets play in relation to κατ' ἀριθμὸν structure of time (i.e. numbers of time), which first required a clarification on the significance of their 'wanderings', and their relation to the content of time.[248] However, with what has been established so far, we can already offer a provisional interpretation of the passage.

As Taylor notes, the two functions that the planets are said to carry out – guarding and delimiting – should not be taken as two separate activities. They most likely are two aspects of the single activity the planets are involved in, which we previously identified in their distinctive

[245] "Les corps célestes ne servent qu'à être vus, leurs corps ne servent qu'à les rendre visibles. Le demiurge les place ensuite 'sur les trajets circulaires que décrivait (ἧειν) la révolution de l'Autre'. Le cercle se meut déjà quand, recevant les astres, il devient le ciel. Et dans la mesure où ces astres rendent visible le mouvement, et, de ce fait, le rendent dénombrable, le ciel est image mobile de l'aïôn. Ce n'est donc pas tant le mouvement qui joue ici le rôle essentiel, ni même les astres en leur visibilité, mais bien ce au service de quoi ils sont tous deux, et qui est la mise en œuvre et en évidence du nombre" (Brague 1982, p. 60).

[246] One could object to my reconstruction that the Demiurge must have been able to measure the motion of the various circles of the cosmic soul in some way, in order to set them up as proportionate in velocity (see 36d6-7). The objection would aim at challenging my claim that there is no distinctively enumerable structure (κατ' ἀριθμὸν) of cosmic motion before the creation of the planets. However, the measurement of the velocity of the periods of the cosmic soul does not require that the circles themselves are structured in an enumerable way. It is sufficient that they are measured by means of an *external* term of comparison. In this case, the term of comparison could be the infallible intellect of the Demiurge, as it is presumably capable of calibrating proportional velocities by reference to intervals marked out in his own mind.

[247] Both Cornford and Taylor read the passage as mainly highlighting the function of planets as instruments for the measurement of time (Cornford 1937, p. 105). Taylor remarks that planets "'divide' or 'determine' the numbers, because we use their revolutions as units for measuring time; they 'guard' the numbers, keep them safe, in fact provide a standard measure, in virtue of the equability of the revolutions" (Taylor 1928, p. 192). I agree on the interpretation proposed by Taylor, except for the claim that *we* are using the planets to divide and determine. As argued above, the planets are instruments for the creation of time, not for its measurement.

[248] Vlastos, in agreement with Cherniss, notes that this passage shows that for Plato there is no identity between the planetary revolutions and time (Vlastos 1965, pp. 409-410). However, it seems to me that he conflates the planets themselves and their revolutions. Time is identical with the latter, not the former.

'wandering' revolutions. The hypothesis that I find most persuasive, in light of my conclusions about the planets as instruments of time, is that the two components match with the planets' double role as *agents* and *instruments*.

The planets are guardians (φυλακὴν) of the numbers of time, as it has been argued earlier, because they are divine agents, directing their own revolution along with the circle of the Different.[249] I also argued that they succeed in the creation of time if and only if each conform to the period of the circle of the Different with which it is associated. Their function as guardians, then, seems to capture exactly the need for an intelligent preservation of their motion, so that it is as regular and circular as the cosmic soul's. Moreover, to move as the cosmic soul does is a precondition for the creation of numbers of time, as it will become clear in sub-section 6.2.2. If the planets were not guardians, that is agents in control of the regularity and path of their motion, time (and its numbers) would not have been preserved.

It also follows from my analysis that the other component defining the planets' activity, namely the planets delimiting (διορισμὸν) the numbers of time, must concern them *qua* visible bodies, and it qualifies the way planets are *instruments*, rather than agents. It is in fact the visibility of the fiery bodies displayed in planetary revolutions that makes them creators of the κατ' ἀριθμὸν structure of time. However, without a better understanding of the enumerability of time, and of how it relates to the planets' visibility, the passage remains somewhat obscure. The conclusion of the analysis of this passage, then, will be postponed to sub-section 6.2.2, once we have familiarised ourselves with the relation between visibility and enumerability.

[249] The action of guarding (φυλάττειν) is importantly determined by what is guarded, and of course allows for a variety of meanings, from 'watching attentively' (*Lg.* 632b, 758a) to the more action-related meaning of 'safeguarding' and 'protecting' (*R.* 333e-334a, *Lg.* 625e-626a, Cf. *LSJ s.v.* φῠλάττω). Certain instances in the *Republic* and the *Symposium* specifically portray the soul as the guardian of the bodily instincts or of the safety of the body (442b5-7, 606a8) or restraining from misbehaviour (188c2). The two most significant instances for the purposes of the passage under scrutiny appear in the *Laws* and the *Timaeus*: at 741b2 the guarding concerns the number of 5040 households established as the precise amount that must not be exceeded or fallen short of. Finally, in the *Timaeus*, we have a naturalistic use of 'guarding', where the blood's fibers are said to *preserve* the blood' natural condition, that is a balance of thinness and thickness (85d2).

Ch. 6: The enumerable structure of time

In Chapter 2 and 4 I argued that time is structured so as to resemble the undivided unity of αἰών (μένοντος ἐν ἑνὶ). However, time is a cosmic phenomenon, grounded in the physical constitution of the cosmic living being, and falls short of αἰών as it is *complex* and *kinetic*. This means that (a) time is structured as a plurality of parts and (b) those parts come to be in a sequence, as a processual completion of a totality. However, the temporal structure, despite the physical limitations, is defined as κατ' ἀριθμὸν (37d6-7, 38a7-8) which, according to the Demiurge's judgement, is the closest possible structure to αἰών's absolute unity. In this chapter, I will generally refer to the κατ' ἀριθμὸν structure as 'enumerable'. Although the reason for this rendering will emerge more clearly once we are familiar with Plato's conception of ἀριθμός, the qualification should already convey the idea that time, as a compound of structure and content, is not an abstract number, but rather content structured κατ' ἀριθμὸν, i.e. in an enumerable way, so that it can be counted, as we do with days, nights, months, years etc.[250]

In this chapter my aim is to enquire into the temporal structure, by answering the 'what' and 'how' questions: *what* an enumerable structure consists in and *how* that structure is brought about. Important groundwork towards answering the two questions has been laid out in Chapter 5, so I will briefly summarise the main conclusions reached there. The seven planets are introduced as instruments of time, as, in Plato's view, their revolutions are collectively identified with time (39d1).[251] In my reading, based on the structure-content dichotomy, that claim is interpreted as the planetary revolutions being identified with the structured content of time, and hence partially identified with both the *content* of time – i.e. the periods of the cosmic soul – and the temporal *structure*.

In the previous chapter I showed in what sense the planetary revolutions are identified with the content of time, i.e. the cosmic periods. Most importantly, however, planets are instruments of time by being structure-creators, and, as I suggested in sub-section 5.3.2, they are so in virtue of the inherently visible nature of their fiery bodies. In other words, the planetary revolutions display, through their visibility, the enumerable structure of time. What remains to be accounted for, however, is the crucial relation between visibility and the enumerability that, in my reading, characterises the temporal structure. For this purpose, I will introduce the notion of *visible pattern*

[250] Paraphrasing κατ' ἀριθμὸν as 'enumerable' does not intend to assign a mind-dependent status to what is so described. The predicate 'enumerable' is meant to single out the objective structural features that are distinctive of being a concrete number (Cf. Arist. *Ph.* IV 12, 220b8-9) as opposed to other kinds of structures that may not enumerable, e.g. geometrical or functional ones, as will be clarified in Section 6.3.

[251] See p. 94 for specific terminological remarks on my use of 'planets'.

and argue that the visible patterns displayed by the planetary revolutions consist in the enumerable structure of time.

To articulate the above reading, however, it is first necessary to take a detour to discuss Plato's conception of number. The detour will enable us to interpret the use of ἀριθμός throughout the account of time, and, in particular, to understand what an enumerable, or κατ' ἀριθμὸν, structure is.

6.1. Concerning ἀριθμός in Plato

The term ἀριθμός is usually translated as 'number'. Our intuitive grasp of the semantics of the term, however, does not adequately capture the semantics of ἀριθμός. A comprehensive discussion of Plato's notion of ἀριθμός would require a major detour from my present enquiry. What I offer, instead, is a brief outline of some relevant distinctions and conclusions proposed in the literature on Plato's philosophy of arithmetic that will be important for my enquiry on time.[252]

The first relevant distinction in Plato's ontology of ἀριθμός is partially captured by the contemporary dichotomy between abstract and concrete objects. In Plato too there are fundamentally two sorts of numbers, abstract and concrete. Concrete numbers, as summarised in Paul Pritchard's interpretation, are conceived by Plato as *enumerable* sets of concrete objects, that is in Plato's terminology, a plurality of sensible things, where each of them is a unit. [253]

The 'of' in question, argues Pritchard, translates in each case as a material genitive, such that concrete numbers are sets constituted by the things specified by the genitive. That view is opposed to the modern conception, that takes numbers to be abstract quantities (usually represented by the series of numerals) predicated of a set or, in a Fregean conception, as properties assigned to the extension of a concept.[254] In the *Republic*, fingers, for instance, are considered to be among the "the visible or tangible bodies that have numbers" (ὁρατὰ ἢ ἁπτὰ σώματα ἔχοντας ἀριθμοὺς, 525d7-8), and concrete numbers are also what a general must be familiar with in arraying orderly ranks of an

[252] For the purpose of this outline, I mainly rely on the important contributions in the work of Henry Mendell, Richard Mohr, Paul Pritchard and, in sub-section 6.3.2, Barbara Sattler (Mendell 2008, Mohr 1981, Pritchard 1995, Sattler 2017). Since the main contemporary debates concerning Plato's understanding of ἀριθμός do not directly affect how we should read the account of time, my interpretation is compatible with most current views on how to understand ἀριθμός in Plato.

[253] 'Set' here should be read as synonym of 'group', 'aggregate', 'collection', and not as the technical notion corresponding to 'class' in set theory. Pritchard argues that Aristotle, Plato, and Euclid worked with a shared understanding of the use of the term ἀριθμός that was also familiar in non-theoretical contexts (Pritchard 1995, pp. 9-23).

[254] The modern conception would describe counting as ascribing the property of being e.g. four, to e.g. a given collection of pebbles, where the property 'four' is just the relation between the set and 'four' in the abstract series of natural numbers (Pritchard 1995, pp. 33-55, 84-86).

army and ships (522b5-e4, 525b1-4).[255] Beyond the *Republic*, clear statements in this sense can be found in the *Theaetetus*, where Socrates enquires into the nature of acres and furlongs, arguing that they just are the same as numbers, evidently intending the concrete kind.[256]

However, in Plato's view, concrete numbers do not exist, nor are they knowable independently of their relation of resemblance with abstract numbers. As it is outlined especially in the *Republic* (although arguably partially reprised in the *Philebus* and in the *Epinomis*), concrete numbers are presented as flawed *instantiations* of abstract numbers in the sensible domain, so that they are qualified as visible, or tangible.[257] Yet, it is also maintained by Plato that despite their inadequacies *qua* numbers, experts in arithmetic still require those visible and tangible numbers as images (εἰκόνες) for studying the abstract ones.[258] This twofold status of perceivable representatives and yet flawed instantiations of abstract, or true numbers, is what defines concrete numbers in the *Republic*.

The language of instantiation used to define the relation between abstract and concrete numbers is similar to the terminology employed for the content-structure relation in the previous chapter, for a good reason. My claim will be that concrete numbers, just as any other concrete mathematical entity, belong to the physical world, and are thus best analysed as a special case of structured objects, or phenomena, in terms of the content-structure dichotomy. Time, in particular, is one of such mathematical compounds of content and structure. It is, in particular, an *arithmetical* one, being composed by concrete numbers of a sort, i.e. the numbers of time. More on this will be said at the end of this section, when I will discuss concrete numbers in the *Timaeus*, and in Section 6.3.

Apart from the relationship they bear with concrete numbers, abstract numbers are rather mysterious entities in Plato's dialogues, and there is no agreement in the literature on how to best conceptualise them. Since in the *Timaeus* the focus is, not surprisingly, on physical, concrete

[255] An analogous expression to the one employed for the fingers is found in the section on astronomy to indicate what the proportions between different temporal units have as their subject matter (τὴν δὲ νυκτὸς πρὸς ἡμέραν συμμετρίαν […] σῶμά τε ἔχοντα καὶ ὁρώμενα, 530b3). The same formulation occurs in the *Epinomis*, when the subject matter of arithmetic is restricted to the numbers themselves, as opposed to numbers that have bodies: ἀριθμῶν αὐτῶν ἀλλ' οὐ σώματα ἐχόντων (990c6).

[256] *Theaet.* 204d. It should be noted, however, that the passage might be presenting a view Plato did not himself hold, as pointed out in Harte's analysis (Harte 2002, pp. 40-47). Even so, what Plato is presenting, is clearly a notion of concrete number that he consistently employs, even if in conjunction with abstract numbers.

[257] *Epin.* 990c5-6; *Phlb.* 56d1-57a4.

[258] 510c-511b. Plato's notion of 'image' is fundamental to his conception of the practise of mathematical sciences as a whole: "mathematical activities proceed by reasoning (διανοεῖσθαι) from hypotheses to conclusions and they involve diagrams, here understood in the most general and Platonic sense, namely as any perceptible that represents a number, a geometrical or stereometrical figure, an astronomical entity, or a harmonic entity, whether Form, intermediate or even perceptible" (Mendell 2008, p. 149).

numbers, the details of what abstract numbers are like won't concern the results of my enquiry, so I will remain neutral about which option to favour in the debate.[259]

6.1.1. The two criteria of optimality

Although Plato's conception of abstract number is disputed, it is generally accepted that in drawing the contrast between abstract and concrete numbers, two criteria of optimality are outlined: indivisibility and sameness. These criteria are mainly discussed in the *Republic* to foreground in which respects concrete numbers fall short of their abstract correspondents. However, given that they make an appearance even in the late *Philebus*, I take it that they are useful criteria to grasp what kind of features characterise an optimal number, in Plato's conception, as opposed to a more generic sense in which any set of items is a concrete number. As we will see in Section 6.2, time, as it is displayed by planetary revolutions, is accounted for as something paradigmatically enumerable, and the source of our first acquaintance with number in general. In Section 6.3 I will explore the possibility that time as it is conceived by Plato fits particularly well with such criteria, and argue that it meets their standards of optimality, insofar as a concrete arithmetical structure can.

The first criterion of optimality (indivisibility) is mainly exposed in the *Republic*, although it is perhaps indirectly referenced in the *Philebus*.[260] The premise is that the one itself (αὐτὸ τὸ ἕν, 525d9), intended as the fundamental part composing numbers, ought to be indivisible, so the expert arithmeticians, when asked to divide the one, takes it to mean that we rather intend to multiply it, i.e. to make the one a plurality of units (525d8-e3). The notion of unit, then, is defined by indivisibility, i.e. as being the opposite of a plurality (μή ποτε φανῇ τὸ ἓν μὴ ἓν ἀλλὰ πολλὰ μόρια, 525e3). A few lines later the same criterion is formulated as absence of internal parts (μόριόν τε ἔχον ἐν ἑαυτῷ οὐδέν, 526a4), which seems to suggest that the units, as the fundamental parts of number, cannot be further divided, so that optimal numbers are composed of mereological atoms.[261]

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[259] The two main options are to conceive the abstract numbers of mathematics (α) as pluralities constituted by purely intelligible units, analogously to their concrete counterpart, or (β) as forms, hence as paradigmatic, intelligible and strictly individual entities standing for different amounts (twoness, threeness, oddness, evenness and so on). Some, however, opt for attributing to Plato a richer ontology, including among abstract numbers both (α) and (β). A comprehensive assessment of the two main alternative exegetical choices that we are presented with is offered in Henry Mendell's article (Mendell 2008, pp. 127-128, 153-156). In Pritchard's reading, the abstract numbers should be conceptualised as (α). However, Pritchard also adds that it is not problematic that the form of twoness is not constituted by two units, unlike its instantiation, since the object of arithmetic, as with all the mathematical sciences, is individuated in the *concrete* numbers, *qua* representatives of the various forms (Pritchard 1995, pp. 150-160). Although Mohr's position resembles Pritchard's with regard to the relation between concrete and abstract numbers, he maintains that Plato takes the concrete number (what he calls the 'phenomenal number') and the set of things which instantiate the number as separate entities (Mohr 1981, pp. 625-627).

[260] In the *Philebus* the issue of being one and of different sorts of units is touched upon (see sub-section 6.3.1, p. 132).

[261] Aristotle's account of measurement offers a similar assessment of the units composing a number. He argues that "'to be one' means 'to be indivisible' (διὸ καὶ τὸ ἑνὶ εἶναι τὸ ἀδιαιρέτῳ ἐστὶν εἶναι), being essentially one means a 'this' and

On the contrary, in concrete numbers units appear "at once one and an unlimited plurality (ὡς ἕν τε ὁρῶμεν καὶ ὡς ἄπειρα τὸ πλῆθος)" (525a5-6), and thereby fail to meet the criterion of indivisibility.

The criterion seems especially relevant for my enquiry because the undivided unity of αἰών is of paramount importance in the account of time. As argued in Chapter 4, presenting αἰών as a mereological atom serves to both highlight its unattainability in the cosmic image and present the paradigmatic term of comparison of the enumerable structure of time. I will argue in Section 6.3 that although the units of time could be divided further – hence not being indivisible in an unqualified sense – none of their subdivisions could function as optimal units in that same domain, because none would meet the criterion of sameness (see below). The units of time are then indivisible in a qualified sense – *qua* smallest *units* in the given domain.

The second criterion (sameness) is also presented in the *Republic* and reprised in the *Philebus*. The criterion does not seem to require sameness between units in *every* respect. However, sameness is all-important in the *qualitative* (i.e. kind) and *quantitative* (i.e. magnitude) respect. Qualitative sameness is not stressed in Plato as much as the quantitative one, being rather uncontroversially presupposed by the account. However, in the example of the three fingers it is specified that they constitute a visible number in virtue of each appearing as fingers, despite the accidental features of being dark or pale, thick or thin, and disposed in a certain order (Δάκτυλος μὲν αὐτῶν φαίνεται ὁμοίως ἕκαστος καὶ ταύτῃ γε οὐδὲν διαφέρει, 523c10-d1). None of those visible features affects their role as units, as long as they are of the kind 'finger'.[262]

Quantitative sameness, on the other hand, is explicitly discussed in the *Republic* as equality in terms of magnitude characterising the units of the optimal number (ἴσον τε ἕκαστον πᾶν παντὶ καὶ οὐδὲ σμικρὸν διαφέρον, 526a3-4). The same criterion is reprised in the *Philebus* to distinguish the sort of units layman arithmetic is concerned with, as opposed to the philosophers' one: "First there are those who compute numbers of quite unequal units (οἱ μὲν γάρ που μονάδας ἀνίσους καταριθμοῦνται τῶν περὶ ἀριθμόν), such as two armies or two herds of cattle, regardless whether they are tiny or huge. But then there are the others who would not follow their example, unless it were guaranteed that none of those countless units differed in the least from any of the others (εἰ μὴ μονάδα μονάδος ἑκάστης τῶν μυρίων μηδεμίαν ἄλλην ἄλλης διαφέρουσάν τις θήσει)".[263] The

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capable of being isolated either in place, or in form or thought; or perhaps 'to be whole and indivisible'" (*Metaph.* X, 1 1052b15-18). In his account, units are a measure of number, just as the unit of measurement measures a continuum (1052b20-24).

[262] Aristotle puts forth for a similar principle, which Sattler calls 'principle of homogeneity', according to which the unit of measurement and what's measured must be of the same kind, applied in the case of number to the unit (*Metaph.* X 1053a24-30). In Aristotle, however, the principle is extended to measurement in general, as we will see in Section 6.3.

[263] 59d9-e3. Similar considerations could also be connected with the ontology presented at the beginning of the *Philebus*, where equality, the double, and everything that is related to number and measure (πρῶτον μὲν τὸ ἴσον καὶ ἰσότητα, μετὰ

concern seems to be that, while concrete numbers might well entail having bigger and smaller units, arithmeticians would require units of the same size.

The argument presented in the *Republic* to explain why quantitative sameness a criterion for the optimality of numbers emphasises once more the issue of divisibility. The claim is that if a unit appears as big or small in comparison to another unit, this causes the two to stop appearing as *units* composing a number. In fact, the comparison makes them appear as both *one* finger and as *more than one* at the same time, as the greater unit of the two would be like the smaller, plus an additional part. The conclusion is that at least certain concrete numbers fail to meet the criterion of quantitative sameness and thereby fail to be composed of proper units.[264]

Moreover, there is an additional beneficial consequence to quantitative sameness that has to do with comparability between concrete numbers in terms of their aggregate magnitude. While in some cases the aggregate magnitude of concrete numbers is irrelevant for the purposes of the calculation (e.g. when we are comparing the number of different groups of people), there are cases in which the units composing the number need to be informative about the aggregate magnitude (e.g. when we compare the aggregate weight by counting different sets of apples). As long as each set has units of the same magnitude, hence individually meeting the criterion of quantitative sameness, such a comparison is possible, given that we can establish a proportion between the units.

Let us consider, for instance, two sets of stones equal in number, whose units are one half of the other: a quantitative comparison would be possible, given that the criterion of quantitative sameness holds for each set separately. In fact, by comparing their respective amounts, we would say that while they are both sets of ten, since the units of one are half the size of the units of the other, the latter set is double the size. However, no comparison would be possible if the units of the two sets were mixed together, since the unit 'stone' would vary in size, hence not being informative about the set it composes. As we will see in Section 6.3, the criterion of quantitative sameness is also important in the case of time, as the proportionality between different numbers of time can only be established because their units meet the criterion.

δὲ τὸ ἴσον τὸ διπλάσιον καὶ πᾶν ὅτιπερ ἂν πρὸς ἀριθμὸν ἀριθμὸς ἢ μέτρον ᾖ πρὸς μέτρον) is introduced as that which pertains to limit. Limit is in fact opposed to the more and the less characterising the unlimited. It seems that according to the ontology of the *Philebus*, it is possible to bring about equality in the mixtures of limit and unlimited, thereby suggesting that concrete numbers can also be optimal (25a6-b3). As we will see below, the same could be hypothesised for the *Timaeus* as well.

264 Εἰ ἄρα ἓν ἑκάτερον, ἀμφότερα δὲ δύο, τά γε δύο κεχωρισμένα νοήσει· οὐ γὰρ ἂν ἀχώριστά γε δύο ἐνόει, ἀλλ' ἕν. Ὀρθῶς. Μέγα μὴν καὶ ὄψις καὶ σμικρὸν ἑώρα, φαμέν, ἀλλ' οὐ κεχωρισμένον ἀλλὰ συγκεχυμένον τι. ἦ γάρ; (b10-c4). The mention of cases in which the appearance is adequate (523b1-2) might suggest that whether all concrete numbers fail to meet the criterion of quantitative sameness is left open.

6.1.2. Numbers in the *Timaeus*

To conclude the overview on Plato's conception of ἀριθμός I return to focus on the *Timaeus*. Unlike in the *Republic*, no conception of the notion of ἀριθμός is put forth explicitly in the *Timaeus*. Hence, it is only possible to infer indirectly whether there is substantial continuity between the two dialogues with regard to their ontology of number. As far as I can see, there is no compelling reason to take the ontology of number from the *Republic* as being retained in the *Timaeus*. The project of a comprehensive cosmogony, with its focus on the physical world and the beauty and perfection of it, is extraneous to the *Republic*, where the physical world is the one we need to learn to turn away from in order to have access to intelligible objects. As part of this more general shift in the assessment of the physical world, the *Timaeus* has no similar commitment to conceive of concrete numbers as falling short of abstract ones, despite the persisting metaphysical dualism.

In the dialogue we are offered several examples of the Demiurge putting the universe in order by means of geometrical shapes, proportions, and numbers, suggesting that the mathematical structures are (1) compounds of structure and content and (2) their structures are optimal and fully intelligible despite being instantiated. The emphasis on the success of the Demiurge in crafting mathematically structured objects appears across the board, at the level of the whole cosmos and down to the most minuscule parts.[265] In the remainder of the section, I will focus on certain specific instances of concrete numbers discussed in the dialogue, so as to present in outline Plato's view on numbers in the *Timaeus*.

Throughout the dialogue, there is a list of occurrences of 'number' that naturally falls under the 'concrete' classification.[266] The clearest ones appear when the micro-structure of the four elements is discussed. There, the Demiurge gives them a distinct configuration "by means of geometrical shapes and numbers" (οὕτω δὴ τότε πεφυκότα ταῦτα πρῶτον διεσχηματίσατο εἴδεσί τε καὶ ἀριθμοῖς, 53b4-5). The enquiry, accordingly, focuses on the concrete numbers involved in the creation of the four bodily elements. Firstly, the numbers of simple triangular bodies compose the three dimensional bodies of individual particles (οἷον δὲ ἕκαστον αὐτῶν γέγονεν εἶδος καὶ ἐξ ὅσων συμπεσόν των ἀριθμῶν, 54d3-4): four equilateral triangles for the tetrahedron (fire), eight for the

[265] The metaphysical imitation between the physical and ideal domain seems to always involve a degree of successful geometrical shaping and dividing according to proportions (Pritchard 1995, pp. 129-130). Remarks showing the complete conformity of the four elements to their mathematical models is given at 53e1 and 56c3-7 among others. On the contrary, the pre-cosmic state could be seen as the state where mathematical structures are lacking completely, except perhaps for 'traces' of the four elements that must bear some sort of distant resemblance to geometrical shapes (53a-b). Admittedly there seems to be room for the geometrical shapes of the four elements to lose their efficacy and perfection, associated with old age (81c-d). Still, in an optimal system as the cosmos, the structure at the macro-level persists unaffected by accidental modifications at the micro-level.

[266] In total, there are nineteen occurrences of ἀριθμός in the *Timaeus*, six of which within the account of time (see the Index of occurrences, *s.v.* 'ἀριθμός', p. 145).

octahedron (air), twenty for the icosahedron (water) and the twenty-four isosceles triangles that make up the cube (earth). Moreover, the numbers of triangles are also crucial to provide an account of the transformations between elementary bodies, at 56c8-57c6. Finally, for each geometrically shaped elemental body, there seem to be a limited number of sizes corresponding to the number of triangles composing the shape (ἀλλ' ἐλάττω τε καὶ μείζω, τὸν ἀριθμὸν δὲ ἔχοντα τοσοῦτον ὅσαπερ ἂνῇ τὰν τοῖς εἴδεσι γένη, 57d2-3).[267]

Concrete numbers are moreover involved in the arrangement of the cosmic body as a whole. There are fixed proportions between the total amount of each kind of elemental bodies, and they are important to maintain the resulting body to be unified, as explained extensively at 31b4-32c4. Although Timaeus' reasoning seems to refer to 'number' in a generic sense (ὁπόταν γὰρ ἀριθμῶν τριῶν…), as he outlines a general principle about proportions, it is nonetheless a principle guiding the instantiation of a specific proportion between bodily parts that constitutes the body of the cosmos (31c4-32a6, 32b3-c2). Even the cosmic soul is structured proportionally by dividing portions in concrete numbers. Although it seems a limiting case, as there is no body to be structured, the soul 'material' is treated as equally capable of instantiating mathematical, and in particular, arithmetic, structure.[268]

The only significant distinction concerning the use of ἀριθμός in the *Timaeus* is implicit and lies in the contrast between concrete numbers and a generic number, which encompasses all the concrete ones, *qua* numbers. There is a small list of occurrences that suggest the employment of an unqualified sense of ἀριθμός. I already mentioned the use of ἀριθμός in the passage concerning proportions in the cosmic body. In that case, Timaeus presents considerations applicable to numbers in general, although they inform a specific proportion between the aggregates of the four elements. Other four instances of generic number appear in the account of time (37d6, 38a7, 39b6, 47a6), and, since they are crucial to understanding the relation between time and number, they will be discussed at length in the next sections.

It remains unclear, however, if the generic number is taken to be an additional and distinct number existing over and above the concrete ones, in the same way geometrical shapes exist as models for the shapes of the four elements.[269] Regardless of whether we intend to read an

[267] See Cornford 1937, pp. 230-239.

[268] The cosmic soul is spatially extended and divisible (ὅλον τοῦτο μοίρας ὅσας προσῆκεν διένειμεν […], ἤρχετο δὲ διαιρεῖν ὧδε, 35b2-4), which makes it eligible to instantiate mathematical structures. The Demiurge is described as operating a series of divisions of the unstructured whole with the goal of making the resulting portions commensurable according to certain proportions in a series. The portions are considered as numbers (at 36a5 and twice at 36b3), presumably because the Demiurge measures out the amount of each new portion by counting either hypothetical or actual units equal to the first portion.

[269] Insofar as the *Timaeus* is concerned, there seems to be little room for an ontology admitting 'intermediate' mathematical entities as a separate metaphysical kind, given that (1) only three fundamental kinds are explicitly

ontological commitment to abstract numbers in the *Timaeus*, the crucial difference from the conception of number presented in the *Republic* is that the generic number is always employed to highlight how concrete numbers successfully instantiate enumerability. So, although, criteria for optimality are not addressed explicitly, the fact that no mathematical structure is presented as flawed is telling of the outstanding craftmanship of the Demiurge. The case of time, as we will see, is especially significant, with respect to optimality.

6.2. The visible patterns of planetary revolutions

This section will account for the enumerable structure of time, on the basis of the insights from the previous overview on Plato's conception of ἀριθμός. Although I will mainly focus on *how* the enumerable structure of time is brought about by means of the planets, I will first roughly outline *what* the structure consists in.[270]

The κατ' ἀριθμὸν qualification in the definition of time captures time's conformity with number, in the generic sense, so that its various parts are units composing concrete numbers. The resulting structure is what I call an enumerable structure. Being concrete, the enumerable structure requires to be physically instantiated. As we have seen in Section 5.3, the temporal structure is instantiated in the cosmos by means of the planets so that it is identified with their visible revolutions. The best way to answer the 'what' question about the temporal structure is then to describe it as the *visible patterns* of planetary revolutions. The temporal structure then differs from simple concrete numbers both because it has multiple units of different length displayed by different planets and because the units, unlike with normal sets of objects, are displayed in a sequence.

Before setting out with the analysis of the conditions that make the planets display enumerability, I will provide an illustrative example of what I mean by 'visible pattern'. As I pointed out already at the beginning of Chapter 5, Plato identifies parts of time such as the night-and-day, month and year with a *full* revolution (κύκλος, περίοδος), along the path of their assigned cosmic circle, i.e. from a certain original position and back to it again along the circular path (πάντας τοὺς κύκλους, 39a5-6; ἡ τῆς μιᾶς καὶ φρονιμωτάτης κυκλήσεως περίοδος, 39c2; τὸν ἑαυτῆς

introduced (see my discussion of the *Timaeus*' ontology in Section 2.1) and that (2) the geometrical shapes of the four elements are derived directly from the abstract shapes incorporated in their forms. Although this remains open to a variety of interpretations, it could be held, given (2), that abstract mathematical forms belong to the intelligible kind, and the same should be hypothesised for the generic ἀριθμός, as the Demiurge must need a non-concrete version to create optimal numbers in the cosmos. However, at least in the case of time, the structural component presented by αἰών is not itself a number, but rather undivided unity. To assume that Plato postulates an abstract number in addition to αἰών as a model for the creation of time leads to an unwanted proliferation of abstract models.

[270] I will return to the 'what' question in Section 6.3, where I provide an in-depth analysis of the features characterising the enumerable structure of time.

κύκλον, 39c3; ἥλιος τὸν ἑαυτοῦ περιέλθῃ κύκλον, 39c4-5). Together with κύκλος and περίοδος, the verb περιέρχομαι emphasises the return of the planets to an original position on the circular path they traverse.[271] I will refer to a planet's return to the original point as a *cycle*. In the iteration of the same circular path with the same overall velocity, a planet is displaying a visible pattern of cycles. A visible pattern, then, is defined by how the visible configurations of the planet change in its motion. The focus, however, is not on the motion of planets *per se*, but on the structural aspect displayed by the planets in their motion, i.e. on the sequence of units.

6.2.1. Visible patterns and configurations

To vindicate the notion of visible pattern as one that adequately captures Plato's conception of time, I will propose a close textual examination of passages from the *Timaeus* and the *Epinomis*.[272] The first piece of evidence is provided in the astronomical section of Plato's account of time. Plato is discussing the teleological function that he ascribes to night and day. Night and day are discussed at 39b2-c2, as having two distinct, albeit connected, functions: (a) they display a visible pattern that stirs the first understanding of number in mankind, and (b) in doing so they constitute, in their alternation, a temporal unit of measurement. In this section I will consider night and day with regard to (a).[273] Their function as a unit of measurement will be discussed in sub-section 6.3.2.

Function (a) is described as bestowing a share in number (μετάσχοι ἀριθμοῦ ἧν προσῆκον, 39b6), "upon all those living beings appropriately endowed", who seem to be exclusively humans,

[271] Aristotle also widely employs κύκλος to highlight the return to an initial point in the astronomical context ("circular motion is motion of a thing from its place to the same place, whereas rectilinear motion is motion from its place to different place", ἡ μὲν γὰρ κύκλῳ κίνησίς ἐστιν ἀφ' αὑτοῦ εἰς αὑτό, *Ph.* VIII 8 264b18-19, again at b27-28; "this at once makes it reasonable that the body which is nearest to that first simple circular motion should take the longest time to traverse its circle", πρώτης περιφορᾶς ἐν πλείστῳ χρόνῳ διέναι τὸν αὑτοῦ κύκλον, *De Cael.* II, 10 291b3-4) and beyond, when comparing the cycles of the seasons with the generation and destruction taking place on Earth. The cycle is there described explicitly as a returning back, so much that the Sun's circular motion is explicitly connected with the continuous alternation of different phases, i.e. seasons (*De Gen. et Cor.* II, 11 338a4-5, 338b3-5). The conclusion of the cycle can entail either that what accomplishes the cycle persists to the next cycle as numerically the same or only in species. The imperishable substances, like the heavenly bodies, are accomplishing cycles while remaining numerically the same, whereas the elements and the perishable compound bodies are not (338b12-13).

[272] My focus will be on four passages in the astronomical section of Plato's account of time where numbers and measures are mentioned in connection with the planetary revolutions (38c6, 39b2-c5, 39c5-7, 39d2-7) plus the eulogistic section on astronomy in the spurious *Epinomis* (in particular 976d5-979b3, 989e1-990c8 and 991b5-992a3). Appealing to the *Epinomis* might be seen as weak support for an interpretation of the *Timaeus*, since we know it is likely a spurious work, generally attributed to Phillip of Opus. In this enquiry, however, the reason to refer to the *Epinomis* lies in the evident affinity between the astronomical sections of the two dialogues, insofar as the relation between number, visibility and planets is concerned. The *Epinomis* can be plausibly read as a more extensive and insightful commentary on an otherwise short discussion. So, even if it is the case that we are not reading Plato's own elaboration, it is nonetheless as close as we can get to a direct testimony about certain details of Plato's conception, that are only hinted at in the *Timaeus*.

[273] Both functions are introduced by ἵνα (39b2, b5) and are later taken to be distinct, although a consequence of the same phenomenon (διὰ ταῦτα, 39c1-2).

due to their capacity to develop a basic astronomical understanding. Timaeus claims that the rotation of the Same, by dragging the Sun along, casts light (φαίνοι, 39b6) across the entirety of the cosmos and together with the partial obstruction provided by the Earth, it creates day and night. The visible phenomenon of the alternation of daylight and darkness produced in this way teaches us (μαθόντα, 39b7) about number, and here 'number' intended in the generic sense clarified in Section 6.1.[274]

The same conclusion is restated and expanded upon at 47a4-7, when Timaeus discusses the benefits of observing the revolutions of the heavenly bodies in the sky, and thus day and night, the months and the periods of the years, and also the equinoxes and solstices (δ' ἡμέρα τε καὶ νὺξ ὀφθεῖσαι μῆνές τε καὶ ἐνιαυτῶν περίοδοι καὶ ἰσημερίαι καὶ τροπαὶ). In the above passage the acquisition of familiarity with number is presented as an artifice or contrivance (μεμηχάνηνται μὲν ἀριθμόν), and it is coupled with the acquisition of the notion of time (χρόνου δὲ ἔννοιαν). Moreover, it is not only the alternation of day and night that matters for learning about number and time, but seemingly all the most familiar parts of time contribute to it. Both passages attribute a crucial role to the visible patterns of the planets in the apprehension of both time and number. In fact, they are the visible stimuli for the apprehension of number and, moreover, by looking at them mankind first becomes familiar with the cosmological conception of time Plato is working with.

Although number and time are indeed treated as separate objects of cognition, the joint apprehension of the two is explained by the visible patterns displayed by the planets. On the one hand, if time is indeed identified with the planetary revolutions and those revolutions are visible – thanks to the planets' bodies – it is only natural to claim that we first learn about time by *observing* those revolutions. On the other hand, if the enumerable structure of time, as anticipated above, consists in the display of visible patterns, it is also the most adequate physical phenomenon to familiarise with number in general. In fact, it is plausible that knowledge about number must be first stirred by something which is particularly suitable to be counted while being outstandingly visible from anywhere.[275]

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[274] The alternation of night and day, in the *Timaeus* just as in the *Epinomis*, is the alternation of two phases across the heaven, daylight and darkness. They are mainly brought about by a heavenly beacon, i.e. the Sun, but the Earth seems also involved in defining those two phases. In the *Timaeus* there is an answer for the 'how' and 'why' of that alternation. The 'how' simply consists in the kindling of the Sun's body. Although all the heavenly bodies have fiery bodies (40a2-4), it is clear that the Sun's light is by far the most intense in terms of the light it casts across the heaven (see Chapter 5, *fn.* 218). The second component needed to produce the alternation, i.e. the Earth, is mentioned only later, as "the guardian and maker of day and night (φύλακα καὶ δημιουργὸν νυκτός τε καὶ ἡμέρας, 40c1-2)". Presumably the Earth is guarding and making nights and days by obstructing sunlight from shining throughout the cosmos. Both Proclus and Plutarch argue in favour of this reading concerning the Earth's involvement in the creation of the day and night (*in Ti.* IV, 139-141; Plut. 1006E).

[275] Thomas Johansen highlights that there are two necessary components behind the teleological account, the first of them being the intellectual faculty for counting, and the second being an appropriate visible stimulus that first activate that capacity. The account in the *Timaeus*, after all, describes the process of making calculations about planetary

To substantiate the reading of the two passages in the *Timaeus* I will now turn to the *Epinomis*, where the connection between time and number is thematised in a more explicit way. There a more detailed account of the apprehension of number is provided, as the baby steps in learning to count are described in terms of increasing complexity. The Athenian makes clear that the visible stimulus from planetary revolutions stirs only a basic understanding of numbers, quantitative relations and properties (for instance, knowledge of two or three, or even and odd, as mentioned at 977c4-6), thus probably being directed towards children or humans living in a thoroughly uncivilised condition.[276]

The description of the steps in the learning process offers a precious commentary on the connected visibility and enumerability of the planetary revolutions that I refer to as 'visible pattern'. The appropriate stimulus to learn to count has its origin in the Sun and the Moon, as we see them most clearly moving across the sky in various configurations. The starting point is once more the daily revolution of the Sun, manifested as the alternation of night and day. The Athenian guest remarks that "of the things he [i.e. the heaven] shows us, taken one by one, what can we behold more beautiful than the kind of the day (τὸ τῆς ἡμέρας γένος)? Later, when we come to see the part of the night, everything appears different to our vision (εἶτα εἰς τὸ τῆς νυκτὸς ἔλθοι μέρος ἔχων ὄψιν, ὅθεν ἕτερον πᾶν αὐτῷ φαίνοιτ' ἄν). Since the heaven never stops making these heavenly bodies revolve for many nights and many days, he never stops teaching humans one and two. For each of us who sees them will also grasp the three, four, and many" (978c6-d5).[277]

The sight of the alternation of day and night is connected with learning to distinguish one and two at first, and then larger amounts. In particular, learning to tell apart one and two comes from the contrasting visible appearance of the illuminated and then darkened heaven (ἕτερον πᾶν αὐτῷ φαίνοιτ' ἄν) caused by the relative positions of the Sun and the Earth. It is, however, also possible

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revolutions as an assimilation of the rotations of the intelligent part of the human soul to the ones visibly displayed by the cosmic god. In this picture, the kind of stimulus received through sight is just as necessary as the intellectual faculty, as Johansen recognises taking the standpoint of the 'empiricist' reading of the account: "If perception is not important to astronomy because of the information it gives us why does it matter whether we look at the sun rather than at a falling stone or the dance of the bumble-bee?" (Johansen 2004, pp. 174-75). I will argue that the planetary revolutions, identified with time, are the most suitable natural phenomenon for the goal of learning to count, as their visible patterns have features that make it optimally enumerable. Given that counting involves considering one unit after the other, the exposition to a visible stimulus in motion is what demands the least intellectual effort in learning to count. The difference between time and other candidates seems to the be (1) the outstanding visibility from anywhere, (2) the kinetic nature of the phenomenon that provides a natural sequence to the units counted; (3) the optimal enumerability, for which see Section 6.3. Each of those features are missing with fingers, stones and other perceivable sets of objects in our everyday life.

[276] At a later stage of development, arithmetic becomes the precondition for the development of every other art, including, it can be inferred, astronomy itself (977d8-e2). However, the subject matter of that science is number itself, the even and odd and the other properties of numbers (990c5-8) so it is not clear how advanced the science is taken to be, beyond the ability to count.

[277] While the 'teacher' is identified with the cosmos itself, just as in the *Timaeus*, in the *Epinomis* the cosmos is also the provider of the intellectual faculty required to count (978d2-4).

that what is recognised as 'one' is not only night or day separately, but the combination of the two, as that compound is always of the same length in its iteration. In this way, night and day are understood as *two* phases composing *one* cycle, the night-and-day.[278]

Both visible patterns – phases and cycles – are enumerable in their display, according to the description. The Athenian guest focuses on the fortnight as an example of a (supposed) period, or cycle, counted as *one* (αὕτη δ' ἔστιν περίοδος, εἰ βούλεταί τις τὸν κύκλον ἕνα ὅλον εἰς ἓν τιθέναι, 978e2-3) and argues that the *fifteen* enumerable phases of the fortnight are marked out by the changing configuration of the Moon, standing against the alternation of day and night, i.e. all the phases of the waxing or waning Moon, from a new moon to the full moon or *vice versa*.

The fifteen phases of days and nights composing the fortnight are then involving the Moon as much as the Sun and the Earth, as all three contribute to the distinctness of each phase in the pattern they compose. In fact, days and nights are phases composing the fortnight in virtue of the difference in appearance displayed by the Moon (ἄλλην ἀεὶ φαίνουσα ἡμέραν). Once all the distinct visible phases, from new to full Moon, have been displayed, and the fortnight is complete, the opposite sequence is displayed by the planets involved (i.e. waxing to waning) and a unit is recognised in the overarching cycle, i.e. the month.[279]

Finally, the Athenian focuses on the month and year in the account as those inducing us to engage in more complex calculations to find a fixed proportion between them, hence learning more generally to compare concrete numbers with units of different magnitude. The pursuit of discovering the exact proportion between cycles is also touched upon in the astronomical section in the *Timaeus* and has been the main pursuit of Greek astronomers until the late V century, as we will see in Section 6.3.

There is an important lesson to be learned from the *Epinomis*' extended description of astronomical observation. The description provides clear indications about which conditions should hold for the instantiation of the enumerable structure of time in planetary revolutions. As anticipated at the beginning of this section, the main condition is to have the planets display visible patterns in their revolutions. However, we can now introduce a further level of analysis with regards

[278] The whole, however, is never repeated in the exact same way, except for the two equinoxes, as there is a great variety of ratios between night and day throughout the course of the year. Nonetheless, it is true that the two phases, night and day, always alternate, although they last for varying fractions of the whole cycle, and the overall cycle is always of the same length. As for the discussion of Plato's conception of the night-and-day as a temporal measure, see sub-section 6.3.1.

[279] "God made a unit by constructing a moon which goes through its course sometimes appearing larger and sometimes smaller, thus always revealing each day as different (διεξῆλθεν ἄλλην ἀεὶ φαίνουσα ἡμέραν) until fifteen days and nights have passed" (978d6-e2). However, it should be noted that if Plato is indeed drawing a substantial distinction between phases and cycles, it is not clear whether the fortnight falls under the latter rather than the former, since, unlike the month, it does not include all the phases, but only half of them. Even if the two fortnights mirror each other in a way, the order between phases in each is the opposite (the waning fortnight does not appear the same as the waxing one). The fortnight is in fact not taken for granted as a cycle in the rather uncommitted evaluation from the Athenian.

to how visibility interacts with enumerability by focusing on the variety of visible patterns the planetary revolutions display. In fact, that variety of patterns can be classified in terms of the planets' changing configurations of visible sameness and difference.

Let us start our analysis with *phases*. Phases generate enumerable patterns in virtue of (1) being each visibly different from the others and (2) being always displayed in a fixed sequence. First consider the phases of night and day, in their alternation. As seen above, they are explicitly defined in terms of the visible difference between them, day as the light cast by the Sun and night as the darkness following from the absence of sunlight. In a similar fashion, the phases marked out by the Moon are enumerable because they always appear different from one another and disposed in a fixed order of succession, up until the fifteenth – a fortnight – or the twenty-ninth/thirtieth – a month.

It should be noted, however, that the day-night cycle is also part of the overall visible configuration of more complex phases involving the motion of other planets beside the Sun. As seen above, the day-night alternation is the backdrop against which we see the Moon changing position and appearance, so that each new phase is marked out as a distinct unit also because a new night-day cycle has been displayed. Hence, phases are defined by the joint display of the night-day cycle and the changing configurations due to the partial progression of the cycle of the other planet involved – in the case above, the Moon. In Section 6.3, I will argue that this aspect of phases is what makes the night-day cycle a μέτρον for all the other cycles and for time as a whole.

With *cycles*, the configuration that marks them as units in a pattern is visible sameness. In fact, the planet returning to the same visible configuration as when it started marks out a cycle. The crucial difference, then, between the enumerability of phases and that of cycles is that, while in the former the units are distinct from one another because of visible difference, in the latter they are distinct in virtue of the return to visible sameness. The two different ways in which phases and cycles are enumerable also entails that, unlike with phases, the visible configuration of a cycle does not tell which cycle in the sequence we are looking at, as they are all visibly identical. This feature will be important for cycles to stand out as units of time among the visible patterns, as we will see in sub-section 6.3.1. However, it is also evident that the visible pattern of phases is intertwined with the display of a cycle, and that their visible sameness is only recognisable because of the sequence of different phases displayed in between. That is why cycles tend to be divided in relation to prominent phases in the sequence, as for instance the equinoxes and solstices that divide the yearly cycle into four parts.[280]

[280] The seasons and the fortnights are measured by certain outstanding phases in the progression of the year and the month respectively, just as they are marked out by the night-day cycle (Cf. Arist. *GC* 336a31-b9).

Finally, when we consider the visible patterns exhibited by more than one planet, there is a third level of complexity beyond cycles, which I will refer to as 'complex cycles'. Complex cycles are marked out similarly to individual cycles, by their return to the same original visible configuration. Unlike individual cycles, however, they are marked out by the visible configurations of two or more planets. The metonic cycle, measured by Meton and Euktemon in 19 years, serves as a standard example of the complex cycles Plato wishes to be investigated further in the *Timaeus*, as we will see in Section 6.3. The visible sameness for the Metonic cycle is the following: at the beginning of the first year and at the end of the nineteenth the Sun and the Moon appear in the same position relative to one another.

The juxtaposed individual cycles are also marking out different complex phases in a fixed sequence. In fact, with each new year completed, the metonic cycle is closer to completion, and that is visibly displayed in the different position the Moon and the Sun have at the end of each year, so that at any point in the Metonic cycle it is possible to infer its stage of completion, just as with phases in individual cycles.[281] The greatest of the complex cycles is the complete number of time, i.e. the complete year, as its completion is defined by the display of *all* possible configurations of *all* the planets, as argued already in Chapter 4.

To sum up, the descriptions in the *Epinomis* and the *Timaeus* present a consistent picture of the enumerability of the planetary revolutions, making apparent how enumerability is built into their visible patterns. The visible patterns created by planetary revolutions are thus correctly identified with the enumerable structure of time and they provide a first stimulus for human beings to acquire a basic familiarity with number in general.

I conclude this analysis with one more remark on the notion of 'visible pattern'. To understand the temporal structure in terms of visible patterns is not to claim that Plato has an anthropocentric understanding of time, according to which 'visible' means that it is visible for *us*. Plato does not describe time as depending on human observers, any more than he does for the visible and tangible body of the cosmos (ὁρατὸν ἁπτόν, 31b4).[282] In fact, the only 'gaze' that assesses the success in creating the cosmos and time is the Demiurge's, i.e. one that is external to the physical world. So, I would argue, visibility here primarily concerns the domain, or medium, in which the structure is displayed.

[281] Eclipses and analogous unusual configurations should then be thought of as outstanding complex phases, so that their variety is what justifies the foregrounding of the astonishing plurality of astronomical phenomena at 39d1-2 and more extensively at 40c3-d2.

[282] Plato never raise the issue of the observer-dependence of time, whereas Aristotle seems to have at least entertained a similar worry concerning the enumerability of time in absence of minds capable of counting (*Ph.* IV 14, 223a22-28).

At the same time, it should be noted that building the enumerability of time on top of visibility is itself a choice made by the Demiurge. The patterns built on the cosmic circles could have been audible or tangible ones, or perhaps the sky might have been entirely obscured by clouds (as it often is in Scotland), hence making the visible patterns inaccessible from Earth. All such options would in a way still result in the creation of time, insofar as they imitate the intelligible unity of αἰών with patterns of cosmic motion 'according to number'.

Hence, the choice to use a visible medium for the creation of time must be justified on a teleological ground. Although Plato never makes explicit why visibility is superior to other media, we have seen that the best living beings in the cosmos, i.e. the heavenly gods, are defined primarily by their fiery nature, and fire is the source of their outstanding visibility. Moreover, as we will see in sub-section 6.3.2, the Demiurge chooses to make the visible patterns especially accessible to living beings on Earth and, in particular, human beings. To make time visible for us, then, is recognised as one of the goals in the making of time just as in the making of sight.[283] So, although in a less than optimal cosmos the time could have been created differently, such that it would be accessible to us, the accessibility of the structure from everywhere in the cosmos given by visibility is taken as an important marker of the excellent work of the Demiurge.[284]

6.2.2. The planets in their function as structure-creators

The account of the enumerable structure of time in terms of visible patterns also helps to complete the enquiry into the function of the planets as structure-creators which I started in sub-section 5.3.2. According to the passage at 38c6, the function of the planets is to delimit and guard the numbers of time (εἰς διορισμὸν καὶ φυλακὴν ἀριθμῶν χρόνου γέγονεν). I argued in the previous chapter that both aspects of their function are accomplished by a single activity, i.e. the planets' twofold revolution: whereas διορισμὸν highlights what their visible body is responsible for (as the

[283] The description of the visible patterns from the Earth in the *Timaeus* and the *Epinomis* does not imply that *that* perspective is necessary to have access to those patterns. While the beginning and end of phases and cycles is more evidently marked out from the perspective from Earth than from, say, the extremity of the universe, the structure of visible patterns does not hinge on that. All that matters, in fact, are the changing configurations of the planets in relation to their twofold revolution. A more significant issue for Plato's account is whether the planets have, as it is suggested, an original position where individual and complex cycles are marked out (see sub-section 4.2.2). This, in fact, would pose problems: if we imagined an observer located in the southern hemisphere who could never see planets in their original position, that person would inevitably fail to reckon time correctly. It is not clear whether Plato admitted the possibility of life anywhere else other than in Europe, Africa or Asia. If he did consider the possibility, then he would have to claim that access to the visible patterns is not everywhere adequate, as there are clear hints in his description of the monthly and yearly cycle that he considers those patterns to end and begin within sight in the Northern hemisphere. Our felicitous perspective on the planets, then, could only have a teleological explanation, as we would have been placed in the hemisphere that allows for a correct grasp of the Demiurge's work.

[284] Gábor Betegh's observations led me to distinguish the two points and to acknowledge the importance of the criterion of accessibility in the decision of making time visible.

instrument), φυλακὴν focuses on their intelligent and divine soul, guiding their revolution to persistently conform to the cosmic circles (as the agent). Finally, both aspects are aimed towards the numbers of time. Now that the visible patterns of the planets have been independently discussed in the previous subsection, we can see how the passage ties together with my overall reading.

My first claim is that the numbers of time delimited and preserved by the planets are identifiable with the visible patterns of cycles, phases and so forth. Given Plato's conception of concrete numbers (see Section 6.1), the visible patterns can be treated as a kinetic case of concrete numbers, where instead of a set, we have a sequence of days-and-nights, months, years. It is fitting, then, that those sequences are referred to as 'numbers of time'.[285]

My second claim is that the changing visible configurations of the planets, analysed in the previous sub-section, fit the description of the διορισμὸν function. In fact, while the use of διορίζω and διορισμός in Plato's work is mostly connected with abstract distinctions between kinds, they are occasionally employed to describe delimitation with regard to phenomena and objects of the physical world. In the *Timaeus*, such terminology denotes either the structural and qualitative *distinction* of the front and the back in the human body, or the material *separation* between the seat of the spirited part of the soul and that of the appetitive part (διωρισμένον ἔχειν καὶ ἀνόμοιον, 45a5; διορίζοντες οἷον γυναικῶν, τὴν δὲ ἀνδρῶν χωρὶς οἴκησιν, 69e6).

A passage from Aristotle on the alleged function of the void illustrates the function of διορίζω to delimit (concrete) number in much the same way as I am suggesting for the planets in the *Timaeus*. He reports in the *Physics* that Pythagoreans admitted the existence of void since they attributed to it the function of separating out natures, and in particular the nature of number.[286] The void delimits the distinct units composing a concrete number, by introducing a chasm between them. In my reading, the function of the planets is similar, insofar as their visible bodies delimit units in a sequence by displaying changing configurations in their motion. As Richard Mohr notes, "a perfectly homogeneous revolving disk, by contrast, could not serve as a clock, since even if its motion was completely regular, we would have no way of determining this, or of counting its

[285] Moreover, evidence that Plato is using 'numbers of time' as the concrete numbers of temporal units can be found in plainly non-theoretical contexts, e.g. in one of Aeschines' speeches, showing that the expression 'number of time' was not astronomical or philosophical jargon. In his speech *Against Timarchus* he uses πολὺν ἀριθμὸν χρόνου to refer to the years of a man's life (*In Timarchum* 1, 49.5; 49.8).

[286] Ὃ διορίζει τὰς φύσεις, ὡς ὄντος τοῦ κενοῦ χωρισμοῦ τινὸς τῶν ἐφεξῆς καὶ [τῆς] διορίσεως· καὶ τοῦτ' εἶναι πρῶτον ἐν τοῖς ἀριθμοῖς· τὸ γὰρ κενὸν διορίζειν τὴν φύσιν αὐτῶν (*Ph.* IV 6, 213b25-28). The terminology employed in the passage can be compared with similar instances in *Metaphysics* I 8, 990a22-27 and, most importantly, *De Caelo* I 275b29-32. While Aristotle would of course distinguish between concrete and continuous quantities for the two case, in Plato there is no similar account, so all cases of physical 'delimiting' equally yield distinctness.

repetitions. We would in fact not even know (by sight at least) that it is moving".[287] The contrast highlights how the visibility of the planets' body is essential to the project of making the cosmic motion enumerable, while a homogeneous disk, and *a fortiori*, the invisible circles of the cosmic soul, would never yield the same result.

Finally, it should be acknowledged that the function of the planets as ensouled, intelligent beings, i.e. as guardians (φυλακὴν), is no less essential to displaying numbers of time than the 'delimiting' function. I argued in Section 5.3 that the regularity with which planets carry out their revolution along the circle of the Different is in fact determined by their intelligence. Regularity, as we will see extensively in Section 6.3, is a crucial precondition to for the optimality of the enumerable structure of time. For instance, a planet failing to be a proper guardian of those numbers would display changing configurations of sameness and difference but not always at the same pace. We would still be able to count each reappearance as a visibly distinct cycle, but we would not consider them as *units* composing a number of time, in that they would not have the same length. In order to be defined by enumerability the visible patterns need the work of intelligence, as nothing else guarantees unerringly regular motion in Plato's account.

6.3. The optimal enumerability of the temporal structure

On the basis of the analysis proposed in Section 6.1 and 6.2, the claim that time moves 'according to number' is finally intelligible. Time consists in the visible patterns displayed by planetary revolutions which Plato also refers to as 'numbers of time'. Hence, κατ' ἀριθμὸν specifies the way in which time is structured i.e. 'in conformity with number', where 'ἀριθμὸν' should be read in the generic sense singled out in sub-section 6.1.2. That specification I rendered in English as 'enumerable'.[288]

'Enumerable', in my reading, captures a specific kind of mereological structure, in which the parts constituting the whole have special features that make them *units*. Time is not, in fact, enumerable in the loose sense in which any whole made of parts is a concrete number, as a set of items. As we have seen in sub-section 6.2.1, Plato takes time to have *the* outstanding enumerable structure in the physical world, so much so that, by seeing the visible patterns of the planetary revolutions, we first acquire a basic familiarity with number in general. In the remainder of the

[287] Mohr 1985, p. 58. However, I maintain that Mohr's definition of time as a cosmic clock misses the mark (see sub-section 1.2.2 for an overview of his account). I will return to Mohr's understanding of Plato's conception of time in my Conclusion.

[288] I read κατά as expressing conformity, *LSJ s.v.* κατά (entry B, IV). Moreover, compare the κατ' ἀριθμὸν qualification with the verb καταριθμέω, 'to count' or 'to enumerate', which Plato uses, for instance, at *Sph.* 266e3. See *fn.* 251 on my paraphrasis of κατ' ἀριθμὸν as 'enumerable'.

chapter I will argue for the hypothesis that time is *optimally* enumerable, and employ the two criteria of indivisibility and sameness (see sub-section 6.1.1) to analyse the outstanding enumerability of the numbers of time. In particular, I will discuss the units of time (6.3.1) and the proportionality between those units, linked with the special function as a measure played by the night-and-day cycle (6.3.2).

6.3.1. The eight temporal units

In Chapter 4 I argued that Plato's account seems to take only certain subdivisions of cosmic motion as parts of time. In particular, I pointed out that the eight cycles (the nights-and-days, months, years and the nameless ones displayed by the five remaining planets), corresponding one-to-one with the eight periods of the cosmic soul, are given an implicit primacy among the parts in which time is divided.[289] My proposal is that their primacy is warranted because they are optimal *units* of time composing the numbers of time, thus playing a fundamental role for the enumerability of time as a whole.

In the account of time there is only one reference to a specific number of time, i.e. the complete number of time (ὅ γε τέλεος ἀριθμὸς χρόνου, 39d3-4), which consists of the maximal number of temporal units (see sub-section 4.2.2). The unit of that number is not specified. However, I'd argue that there is a structural reason to take the eight cycles as the units of the numbers of time over the other subdivisions of planetary revolutions we have seen in Section 6.2. Let us first compare cycles and phases. Referring to a specific phase, say the one marked out by the full Moon, is possible only if we specify to which month it belongs to. On the contrary, we do not need any further specification to refer to any night-and-day, month, year, once we clarified how many cycles away from the present cycle in the future or the past.

In the above discrepancy lies the structural difference between cycles and phases, showing why cycles play the part of units in the optimally enumerable structure of time, whereas phases do not. Counting phases is intelligible only within the progression of a given cycle, since their sequence is defined by visible difference (e.g. the different appearance of the Moon) and it ends

[289] Apart from the almost exclusive focus on the eight cycles in the astronomical section (37e1, 39b2-d1), the *Timaeus* at large offers several examples of the familiar practice of measuring human lifespans and past events with reference to the corresponding numbers of years: τῆς δὲ ἐνθάδε διακοσμήσεως παρ' ἡμῖν ἐν τοῖς ἱεροῖς γράμμασιν ὀκτακισχιλίων ἐτῶν ἀριθμὸς γέγραπται (23e2-4). Cornford translates 'ἀριθμὸς' as 'age' (Cornford 1937, p. 16). 'Χρόνος', is used a particular interval of time twice in the introductory part where Critias narrates in outline the myth of Atlantis: once when Critias refers to the time, i.e. the year when the older Critias was 90 years old (21b6), and the other describes what happened after some time (ὑστέρῳ δὲ χρόνῳ) from the victory of the ancient Athens when in one day and night (μιᾶς ἡμέρας καὶ νυκτὸς) a cataclysmic event submerged the Athenian force and the isle of Atlantis (25c7-d1). See Index of occurrences, *s.v.* χρόνος, p. 145.

with the completion of the cycle, that is when there is a return to visible sameness. Moreover, every kind of phase, with the exception of the 'day' and 'night' phases, is enumerable only in virtue of the juxtaposition of visible difference with the daily cycle.

Cycles, however, are defined by a return to sameness, so that the pattern they compose consists in a sequence that extends for the totality of time, where any given year is visibly identical to any other. The only upper limit for the number of cycles seems to be the complete number of time, after which the same enumerable structure is repeated, over and over. However, even in that case, there is no visible difference between the last year in one complete year and the first one in the next, and their difference comes to the fore only when we consider that year as part of a complex cycle.

Complex phases are not optimal units either, as they suffer from the same issue raised for the phases of individual planets, with the only exception of the complex phases relative to the complete year. The entire sequence of those phases, in fact, corresponds to the whole of the temporal structure, hence not needing any further specification, as is the case for individual cycles. However, just like all the other phases, the complex phases of the complete year still need to be marked out by individual cycles in order to be enumerable. Finally, complex cycles are not eligible as optimal units. They inherit the features outlined for individual cycles, so they are not deficient units in the way phases are. However, the complex cycles cannot be optimal units, insofar as the individual cycles are the basic components that compose and measure them, as smaller units. For instance, the Metonic cycle is divided in years and months.

To sum up, cycles are structurally outstanding as temporal units for two connected reasons: (1) they constitute a sequence of *identical* units for the totality of time (2) while also not being further divided in smaller units for which (1) holds true. Significantly, these two aspects characterising cycles resemble the two criteria of sameness and indivisibility defining the units of optimal numbers (see sub-section 6.1.1): (1) the cycles in the sequence meet the criterion of sameness (qualitative and quantitative). Cycles are in fact all of the same *kind* and *length*. In fact, cycles are defined by the visible configurations of the planets, and in particular, by the return to an original visible configuration caused by a full planetary revolution. This makes all cycles qualitatively identical, unlike phases. Moreover, because the planetary revolution that defines the cycle is regular, i.e. carried out at the same velocity in each iteration, cycles are quantitatively identical to one another, or of the same length.

Moreover, (2) cycles are indivisible, insofar as they are the smallest temporal units that meet the criterion of sameness, so they meet the indivisibility criterion, albeit in a qualified sense. While complex cycles and phases can be broken down into individual ones, there are no smaller optimal

units, if we divide the eight cycles further. Since phases, despite being smaller than their respective cycle, are not viable candidates as temporal units for the reasons presented above, cycles structurally stand out as the optimal units of the temporal structure. Barbara Sattler aptly refers to this kind of qualified indivisibility as qualitative indivisibility, arguing that there are units that, if further divided, would no longer be units of that domain. In the case of time, the domain is delimited by the visible patterns displayed the planets, so, among them, cycles are the smallest units that are also identical in the sequence. If we were to consider further divisions of cycles (e.g. phases), we would not have optimal units of time anymore.[290]

Admittedly, my remarks do not conclude that cycles are indivisible in the absolute sense presented by Plato in the *Republic*. Their relation to the absolute unity of αἰών is more like the one presented in the *Philebus*, where 'true' unity is compared and related to the sort of unity attainable for physical objects that have generation and destruction and are also further divisible.[291] Optimal visible units resemble as closely as possible the absolute intelligible unity, given the ontological constraints of the physical world.

Finally, as suggested in sub-section 4.2.1, in Plato's conception it is not possible to further reduce the complexity of the temporal structure by identifying only the smallest of the eight cycles, i.e. the daily one, as a unit of time, even though it measures out every other cycle.[292] In fact, *all* planetary revolutions are identified with time, and this means that each is individually enumerable, and hence constituted by numbers and units of time. If any of the planets were to be removed, time would not be complete. As shown in Section 5.3, the planets are instruments of time only insofar as they make visible the motions of the circles of the cosmic soul, i.e. the content of time. If any of those circles hadn't corresponding visible patterns, the result would not be an appropriate image of αἰών.

[290] "Attempting to divide such a unit indivisible in quality would lead to something that is no longer part of the respective field (of our musical scale, of scanning, or of speech). By contrast, units indivisible in quantity could in principle be divided and still be used as a unit for measuring the same magnitude: for example, in principle we could use a half foot (understood as a unit for length) as our basic unit to measure the length of our table" (Sattler 2017, pp. 279-280). The claim that the circular motion of the heaven is a primary part of time is challenged by Aristotle, as pointed out in sub-section 4.2.1.

[291] The true unit that is always the same (μίαν ἑκάστην οὖσαν ἀεὶ τὴν αὐτὴν) is presented as that which 'lends' unity to physical units, as "it is afterwards found again among the things that come to be and are unlimited" (*Phlb.* 15a1-c3). Note that in the *Timaeus* unity is predicated of the cosmic body, in virtue of the harmony between the four elemental components (31c3), which shows a somewhat similar conception.

[292] It might, however, have been the reasoning behind the definition of time of the Platonic *Definitions* (see Section 1.1).

6.3.2. Proportionality between numbers of time

The enumerable structure of time is complex, as it is composed by eight concomitant sequences of numbers of time – one for each unit of time. To have fixed proportions between the different units, then, seems all-important, as otherwise the complexity of the structure would hinder the enumerability of time as a whole.[293] Moreover, I will argue, the proportionality between the units of time is a precondition for having a measure of time, i.e. the night-day cycle, on the one hand, and the maximal number of time, i.e. the complete year cycle, on the other.

In order to discuss proportionality, however, Plato's astronomical account in the *Republic* should be briefly discussed. There Plato holds that there is no proportion between temporal units, as part of a radical criticism of the empirical approach of astronomical studies.[294] At first, Glaucon holds that atronomy consists in a basic understanding of time ("a better acquaintance with the seasons, months, and years"), taken to be primarily useful for all sort of practical uses, i.e. for a general as well as for the farmer and navigator (527d2-4).[295] However, Socrates is critical of the view of astronomy presented by Glaucon, as it focuses on the visible revolutions of the heaven *per se*, and does not take them for what they are, i.e. a flawed representation of something else (τῇ περὶ τὸν οὐρανὸν ποικιλίᾳ παραδείγμασι χρηστέον τῆς πρὸς ἐκεῖνα μαθήσεως ἕνεκα, 529d7-8), following the analogous criticism offered about the other mathematical forms of enquiry (see Section 6.1 for the 'arithmetical' cases).

In fact, Socrates' claim is that, because days, nights, months and years are nothing else than motions of visible bodies, astronomers are bound to fail to establish a proportion (συμμετρίαν) between them (in particular: "day to night, day to month, month to year") that is not subject to variation (ταῦτα ἀεὶ ὡσαύτως καὶ οὐδαμῇ οὐδὲν παραλλάττειν).[296] The heavenly motions should

[293] Although Plato does not state it openly, proportionality makes the structure more unified. Consider for instance the importance of proportions in the arrangement of the cosmic body and soul (31c-32c; 35b-36b).

[294] Astronomy is classified as fourth, together with harmony, among mathematical sciences, following in terms of increasing complexity arithmetic, geometry and stereometry. In particular, it is categorised as the mathematical science concerning number and proportion in the movements of the heavenly bodies. It however relies on geometry and stereometry as much as on arithmetic, insofar as the bodies that are in motion have depth and a geometrical shape (ἀστρονομίαν ἔλεγον, φορὰν οὖσαν βάθους, 528d10). It should be noted that the extent to which the *Timaeus*' account is a rejection of the *Republic*'s one is itself the focus of a longstanding discussion in the literature. See for instance the interpretations of Alexander Mourelatos (Mourelatos 1981) and Ivor Bulmer-Thomas (Bulmer-Thomas 1984).

[295] The identification between the months, seasons, years and the respective planetary revolutions is in the background of the *Republic* account as much as it is made explicit in the *Timaeus*. The proportions between the parts of time are said to concern what belongs to the visible and the bodily (σῶμά τε ἔχοντα καὶ ὁρώμενα, 530b3) namely the movements of the heavenly bodies (τῶν ἄστρων φορὰς, 530a5). Earlier in Book VII, the Sun is explicitly presented as responsible for the seasons and the year: ὁ τάς τε ὥρας παρέχων καὶ ἐνιαυτοὺς (516b8-9).

[296] 530a8-b3.

instead be used as representations to focus on the measurement of an abstract and true swiftness and slowness.[297]

Socrates does not clarify in what respects the proportion between numbers of time with different units deviates (παραλλάττειν). However, it is at least clear that the deviations do not occur only under exceptional circumstances, as in the *Timaeus* and the *Statesman* (see sub-section 4.2.2), and are rather pervasive throughout the sequence of temporal units. However, there are at least two ways to conceive of the deviation: (1) the planetary revolutions are not carried out always with the same velocity or on the same path, and as a result the temporal units in the sequence are not always of the same length nor are they marked out by the same visible configurations. If so, the visible patterns aren't optimally enumerable at all, infringing on the sameness criterion, both *qualitatively* and *quantitatively*. Consequently, there cannot be fixed proportions. (2) The planetary revolutions are regular, so the visible patterns do meet the criterion of sameness, and yet the planets move at incommensurable velocities, thus making it impossible to have proportions between the units of time. Assuming that the astronomical account introduced in *Republic* Book X expands on the astronomical claims from Book VII, it seems that option (1) is more likely. In fact, Lachesis, Clotho and Atropos are described as producing alterations in the course of the eight circles at certain times (διαλείπουσαν χρόνον, 617c5-d1) so that there would be a pervasive deviation for the reasons outlined in (1).

It is all the more significant, given the above account, that in the *Timaeus* the opposite claim is upheld, namely that fixed proportions stand between the visible patterns of the planetary revolutions. Plato clearly excludes option (1), as we have seen already in the previous sub-section, since all cycles in the sequence are normally identical, both qualitatively and quantitatively, hence meeting the sameness criterion. However, he also rejects option (2) in the description of the eight periods of the cosmic soul: at 36c4-d7 they are described as seven unequal cycles (ἑπτὰ κύκλους ἀνίσους) – their velocities being homogeneous in three cases (τάχει δὲ τρεῖς μὲν ὁμοίως; the second, the third and the fourth), and non-homogeneous in the remaining four (τοὺς δὲ τέτταρας ἀλλήλοις καὶ τοῖς τρισὶν ἀνομοίως; the first, the fifth, the sixth and the seventh), and nonetheless proportionate (ἐν λόγῳ δὲ φερομένους, d6-7).

[297] "But we should consider their motions to fall far short of the true ones—motions that are really fast or slow as measured by true numbers, that trace out true geometrical figures, all in relation to one another, and that are the true motions of the things carried along in them (τῶν δὲ ἀληθινῶν πολὺ ἐνδεῖν, ἃς τὸ ὂν τάχος καὶ ἡ οὖσα βραδυτὴς ἐν τῷ ἀληθινῷ ἀριθμῷ καὶ πᾶσι τοῖς ἀληθέσι σχήμασι φοράς τε πρὸς ἄλληλα φέρεται καὶ τὰ ἐνόντα φέρει). And this, of course, must be grasped by intelligence and thought, not by sight" (529d1-5). While there is no need to draw a substantial comparison between the two dialogues in this respect, the abstract model deficiently displayed by the planets in the *Republic* does in some respects correspond to the invisible rotations of the circles of the cosmic soul in the *Timaeus*: they both are invisible, in motion and perfectly regular. As argued in Chapter 5, however, the planetary revolutions in the *Timaeus* do display accurately the invisible motion of the cosmic soul in the visible domain.

Further evidence that this view is endorsed in the *Timaeus* comes from the description of the task of astronomers in studying and measuring the planetary revolutions, at 39c5-7. The passage states that the expert astronomers' give names to their revolutions and measure them against each other, examining them by means of numbers (πρὸς ἄλληλα συμμετροῦνται σκοποῦντες ἀριθμοῖς). The verb συμμετροῦνται seemingly describes a comparative measurement looking for a fixed proportion, which would be impossible, according to the *Republic*'s account. Moreover, the passage clarifies that it is by means of numbers, i.e. the numbers of time displayed by the planets, that the measurement takes place.[298] In Plato's view, then, the pursuit of the astronomers is mainly a study of the numbers of time identified with the visible patterns displayed by planetary revolutions.

The night-and-day cycle is the only unit that, in Plato's account, stands in a simple proportion (one to a number) to the other temporal units, as we will see below. In all the other cases the fixed proportion is expressed between two numbers of time. Importantly, the approach of the expert astronomers outlined by Timaeus matches with the historical development of Greek astronomy prior to or coeval with Plato. Astronomers played a crucial role in devising more and more precise calendars to better match the patterns displayed by the planets and add a minimal number of intercalary months.[299] The most precise proportion between months and years in Plato's times is presumably the metonic cycle, discovered in the late V century. The cycle lasts 19 years, corresponding to 6,940 nights-and-days and 235 months.[300]

Plato's description of the pursuit of the astronomer suggests that he either intends to encourage or just reports a systematisation of the study of complex cycles beyond the one involving the Sun and Moon. The emphasis on the discovery of the complete year, as the maximal number of time that astronomers would eventually be able to calculate by following up on the practise he describes, further supports this reading. The complete year would be measured by a simple

[298] I read σκοποῦντες ἀριθμοῖς as an instrumental dative. The standard translation of ἀριθμοῖς is 'numerical reckonings' or 'numerical measurements', in Cornford 1937, p. 116 and Zeyl 2000, p. 26. However, if the ἀριθμοῖ employed by astronomers were simply the computations in our minds, it would not add much as a qualification, given that the verb συμμετροῦνται already describes a comparative measurement. My reading is instead that 'numbers' refers to the numbers of time as the precondition for measuring the velocity of the planetary revolutions.

[299] It is possible that intercalation of days-and-nights and months in lunisolar calendars had been carried out since at least Hesiod, given that the month of Lenaion was associated in a fixed way with the winter season (Hannah 2005, p. 30). Early solutions at intercalating were simply to add an additional month (that is 30 nights-and-days) every two years, so that there would be an alternation of a year of 360 nights-and-days and one of 390, and similarly, for the month, between the length of 29 and 30 nights-and-days. The measurements became more precise when the dates of festivals started to require calendars that matched closely with the planetary revolutions, leading to the discovery of a longer cycle called 'octaeteris', corresponding to eight years and ninety-nine months. With the discovery of this new complex cycle, the calendars added only three 30 nights-and-days long months (instead of four) over the course of the eight years cycle (Hannah 2005, p. 31-40).

[300] Only 7 intercalary months were added, so that, of the total number of months in the metonic cycle 110 were 'hollow' (29 nights-and-days long) and the remaining 125 were 'full' (30 nights-and-days long). Scholars, however, do not agree on how accurate and trustworthy Geminos' testimony on those numbers really is (Hannah 2005, p. 56-57).

proportion of one (complete year) to a whole number of time – where the unit could be any one of the eight cycles.

Before wrapping up the enquiry into the enumerability of the temporal structure, the special function of the night-and-day cycle, as a μέτρον ἐναργές (39b2), needs to be briefly discussed. Plato recognises that, among the eight revolutions (περὶ τὰς ὀκτὼ φορὰς, 39b3-4) the one along the circle of the Same stands out and it is consequently devised by the Demiurge to have a special function as a temporal μέτρον.[301]

As Barbara Sattler pointed out, there is no substantial account of μέτρον in Plato's dialogues, although the term is central to his theorising, especially in late works like the *Philebus* and the *Statesman*.[302] For this reason, I will refer to Aristotle's more developed account of measurement as a term of comparison for Plato's treatment of the night-and-day cycle. Aristotle famously defines the notion of measure, in general terms, as "that by which 'how much' is known (μέτρον γάρ ἐστιν ᾧ τὸ ποσὸν γιγνώσκεται)" (*Metaph.* X, 1052b20). The definition is compounded with a guiding principle, named the 'homogeneity principle' by Barbara Sattler. The principle states that both the measure and what is measured must share the respect under which the measurement is taking place: hence, a length is the measure of a greater length and so on.[303]

Aristotle applies the principle in the case of astronomy by identifying the motion of the heaven (corresponding in Plato's terminology to the motion of the circle of the Same) as the unit of measurement employed to measure all other astronomical motions. He argues in the *Metaphysics* that we know 'how much' about motion "by the simple motion and the swiftest, for this takes the

[301] The clause introducing the temporal measure at 39b2-3 (ἵνα δ' εἴη μέτρον ἐναργές τι πρὸς ἄλληλα βραδυτῆτι καὶ τάχει καὶ τὰ περὶ τὰς ὀκτὼ φορὰς πορεύοιτο) has raised a discussion about the best syntactical reading. The crux of the discussion lies in the καὶ τὰ, which Fraccaroli proposes to emend as καθ' ἃ, followed by Zeyl (Zeyl 2000, p. 25). In Cornford's conjecture, the καὶ in question should not be read, moreover reading τι as τίνι, with the resulting translation: 'with what relative slowness and swiftness the bodies involved in the eight revolutions travel' (Cornford 1937, p. 115 *fn.* 1, 4). Mohr proposes a different reading, retaining καὶ τὰ and translating 'in order that [the planets mentioned earlier] in their swiftness and slowness relative to each other should be a sort of conspicuous measure and [in order that] the things regarding the eight revolutions should be conveyed'. In his reading, the sunlight makes every planet stand out as a measure (Mohr 1985, p. 59 *fn.* 11). Although I am sympathetic to the idea that the measure does not only concern the Sun, since they all share in that revolution, I do think that the Sun's outstanding visibility in its revolution along the circle of the Same is what ultimately provides the visible pattern.

[302] Sattler 2017 p. 257-258 *fn.* 1. There is a brief mention in the *Statesman* of an art of measurement (τὴν μετρητικήν) which is distinguished from the more ethically oriented or qualitative kind. The former kind clearly focuses on the purely quantitative nature of what is measured: it comprises "all the arts which measure number, length, depth, breadth, and speeds in relation to their opposites". Plato is referring, among others to ἀριθμοῖ, in the generic sense of the arithmetician, and, following Rowe's conjecture, astronomical speeds (284b6-285c2, Rowe 1995, pp. 209). Unfortunately, the discussion focuses on the other kind of art of measurement, the one regarding the ethical side, so it is not clear how measuring works in the case of quantity. In the *Philebus* μέτρον is mentioned in particular with regard to one of the four ontological kinds that are distinguished by Socrates. The kind named 'limit' in particular, counts within its scope, the proportioned, τὸ μέτριον together with quantity, τὸ ποσόν and with ἀριθμός. Later on, the third kind is introduced again with a reference to measure: "I treat all the joint offspring of the other two kinds as a unity, a coming-into-being made through the measures imposed by the limit (γένεσιν εἰς οὐσίαν ἐκ τῶν μετὰ τοῦ πέρατος ἀπειργασμένων μέτρων)" (*Phlb.* 24c6-7; 26d7-9).

[303] Sattler 2017, p. 267.

least time. Hence in astronomy a unit of this kind is the starting point and measure (διὸ ἐν τῇ ἀστρολογίᾳ τὸ τοιοῦτον ἓν ἀρχὴ καὶ μέτρον); for they assume that the motion of the heaven is uniform and the swiftest (τῇ ἁπλῇ κινήσει καὶ τῇ ταχίστῃ), and by it they judge the others" (*Metaph.* X, 1053a8-12). Moreover, in the *Physics* it is added that the number of the heavenly motion is the most knowable (ὁ ἀριθμὸς ὁ ταύτης γνωριμώτατος), which I take to mean that the heavenly motion is 'the most clearly enumerable'. The passage seems to be a clear parallel to Plato's account of the alternation of night and day as that which taught humans how to count (see Section 6.2). That same accessibility, together with its speed and simplicity, makes that motion an astronomical and temporal measure for Aristotle.[304]

Plato's account of the temporal measure shares most of Aristotle's analysis. In fact, the period of the circle of the Same that drags around the Sun is presented as the swiftest and uniform one (τῇ ταὐτοῦ καὶ ὁμοίου περιφορᾷ, 36c7-d1; also repeated at 39b7 and d6; τὰ τάχιστα περιιόντα, 39a4), clearly standing out in comparison with the circle of the Different and its subdivisions, which are slower and not uniform as a whole. As a result, the unit of time that corresponds to that period is the smallest temporal unit and the most precise to answer 'how much' questions concerning time.[305]

However, not surprisingly in light of my reading, Plato's account, unlike Aristotle's, takes outstanding visibility (i.e. ἐναργές) as an essential essential condition to create a temporal measure: the creation of the night-and-day cycle consists in the kindling of the Sun, such that it greatly outshines every other heavenly body. As we have seen in Section 6.2, in Plato's account, visibility grounds the instantiation of enumerability in the cosmos. The other side of the coin, then, is that there is no temporal measure without it being a visible pattern.[306]

However, we might legitimately wonder why Plato thinks it necessary, in order to have a visible measure, that the Sun outshines the other planets. After all, the revolution along the circle of the Same is shared by the each of the seven planets, so that they all already display a visible pattern along the same circle. I would argue that, in Plato's account, having a *single* planet bringing that

[304] "Time is measured by motion as well as motion by time (this being so because by a motion definite in time the 'how much' both of the motion and of the time is measured): if, then, what is first is the measure of everything homogeneous with it, regular circular motion is above all else the measure, because the number of this is the best known", (223b13-223b24). Since time is the number of motion in Aristotle's account, the heavenly motion is not only an astronomical measure, but also a measure of time.

[305] As for why the fixed stars are not considered as a candidate, see sub-section 5.3.1.

[306] "In this way and for these reasons night-and-day, the revolution of the single circling, the wisest one, came to be (νὺξ μὲν οὖν ἡμέρα τε γέγονεν οὕτως καὶ διὰ ταῦτα, ἡ τῆς μιᾶς καὶ φρονιμωτάτης κυκλήσεως περίοδος)". In my reading περίοδος refers to the revolution of the Sun along that circle of the Same, not to the motion of the circle in itself (see sub-section 5.3.1 for a discussion of Plato's terminological ambiguity). The reference to night-and-day as a περίοδος, moreover, highlights the unity of night and day as a cycle. Taylor remarks that "the period is therefore taken to be 24 hours, a νυχθήμερον. Νύξ is mentioned before ἡμέρα in accordance with the practice of reckoning the day from sunset to sunset" (Taylor 1928, pp. 214-15). Whereas the term νυχθήμερον only appears in the following century, Plato already shows awareness that the true unit lies in the cycle, not in the two phases of the revolution separately considered.

pattern to the fore is interpreted as an improvement operated for our sake. Having a single, outstandingly visible measure instead of seven is in fact a solution to the problem of misleading appearances of the planetary revolutions (ἀπέφαινεν, 39a5-b2), illustrated in the lines of dialogue immediately preceding the creation of the temporal measure. To us, it might look as if the swifter planets are slower and *vice versa*, and that is because it is difficult to visualise the two contrary revolutions as distinct trajectories, since the circle of the Same equally affects all the planets. With the outstandingly visible pattern of nights-and-days, however, the configurations of visible sameness and difference of all the other planets become more distinct, and, as a consequence, the velocity of their revolutions is more easily measurable.

Yet, the teleology-driven choice makes for an *objective* difference in the visible patterns constituting time. Because of its outstanding visibility, the alternation of night and day displays most clearly the rotation of the Same in the visible domain. In this way, temporal structure as a whole is also improved, as the phases of the other seven cycles become enumerable in their juxtaposition with the night-and-day cycle: as noted in sub-section 6.2.1, we count the phases constituting a fortnight as fifteen nights and fifteen days, by seeing the visible difference in the progression of the Moon juxtaposed to the sameness in the repetition of the night-and-day cycle. And the same considerations apply to the phases of the other cycles.

Moreover, phases clearly illustrate the function assigned to the night-and-day as a visible *measure* of time, that is, in Aristotle's wording, as that by which the 'how much' is known. The repetition of the night-and-day cycle marks out the complete sequence of phases dividing the other seven cycles. In this way, the number of phases marked out corresponds to an (approximately) simple proportion, i.e. one to a whole number, between the other cycles (measured) and the night-and-day cycle (measure).[307] This simple proportion, in turn, is employed by astronomers as an intermediate term for discovering the fixed proportions between the other seven cycles, and, with the systematisation of measurements described by Timaeus, more and more complex cycles become precisely measurable. Finally, Timaeus specifies that the fulfilment of the complete number of time – the maximal cycle – is also measured with reference to the circular motion that corresponds to the night-and-day cycle (τῷ τοῦ ταὐτοῦ καὶ ὁμοίως ἰόντος ἀναμετρηθέντα κύκλῳ, 39d6).

[307] There is overwhelming evidence that the Greeks consistently used nights-and-days to measure the normal course of months and years (30 and 360 nights-and-days respectively), and especially abnormal length, like in the early intercalary system, when nights-and-days were added to months or years to comply with the actual course of the heavenly revolutions (Hannah 2005, pp. 29-41). Plato was probably aware that the proportion between the night-and-day and the month is not exactly a simple one, since nights-and-days were commonly added to calendars to compensate for the misalignment with the year. Nonetheless, the night-and-day cycle, in virtue of being the smallest one, is also the cycle that is closest to having a simple proportion with the other cycles, hence allowing for the most precise measurements.

CONCLUSION

Plato's conception of time has been analysed in three steps.[308] In Part I, I argued that Plato conceives of time as a *cosmic* phenomenon, that is as an essential feature of the cosmic living being. In Part II, I focused on why time, as a cosmic phenomenon, resembles αἰών, arguing that both are totalities of life, defined as a compound of structure and content. Finally, in Part III I focused on how time is a totality of life which is characterised by enumerability and identified with the visible patterns of the planetary revolutions. Now the complete picture of Plato's conception of time can be summarised as follows: time is an *enumerable cosmic phenomenon resembling* αἰών. Each of these bits are necessary, in my reading of Plato, to qualify time:

(1) *cosmic*: Plato's conception of time is cosmological in a strong sense, as it takes time to be constitutive of the cosmos, and, in particular, of its completeness as a living being.

(2) *phenomenon*: I refer to time as a phenomenon, rather than as 'feature' or 'object', because Plato defines time as 'moving image', hence singling out the kinetic and visible component as essential to time: the kinetic component refers to the eight periods of the cosmic soul that constitute the content of time. The visible component refers to the planets that, by collectively revolving along the cosmic periods, make the cosmic living motion visible.

(3) *resembling* αἰών: αἰών, as the paradigmatic and everlasting totality of the CILB's life, sets the standard for the creation of time. Time, then, by imitating αἰών, is the corresponding totality of cosmic life. This explains why time is structured on the basis of the cosmic periods, in its parts and as a totality.

(4) *enumerable*: finally, the visibility of the planets in motion mentioned above displays the enumerable structure of time ('according to number'), that resembles the undivided unity characteristic of αἰών: in their revolutions, planets display visible patterns that consist in sequences of optimal units and numbers (nights-and-days, months, years and so on).

[308] There are many more aspects of Plato's conception that I haven't had space to address properly. I only touched upon the relation between time and the intra-cosmic living beings, most importantly humans, in the Introduction and in Section 6.2 and 6.3 with the observation of the planetary revolutions. Plato does however consider it further, by referring to mortal lifetimes (τὸν προσήκοντα χρόνον βιούς, 42b3) and by thematising, both in the *Timaeus* and other late dialogues, the relation between human history and time (see Sattler 2010). A further aspect I barely touched upon is tense. As explained in the Introduction, tense is not, in my reading, part of the creation of time. However, its relevance for time cannot be overstated, so a more developed assessment of how the two are connected would be of paramount importance. Moreover, given my reading of time, a more systematic comparison could be drawn with the mixtures from the *Philebus*, as they are a clear analogue in accounting for physical objects and phenomena as structure-content compounds (see Harte 2002 or Sayre 1998 for attempts at cross-dialogical comparisons of this sort).

In my reading, Plato's cosmological conception yields a reductionist account of time.[309] It is reductionist in the peculiar sense in which the familiar notion of clock, while a natural counterpart to a non-cosmological conception of time, becomes unintelligible in Plato's conception. I already pointed out in my criticism of Mohr's reading, in sub-section 1.2.2, that the notion of clock we are familiar with (from *OED*: "an instrument for the measurement of time") assumes that any object in regular motion equally measures time, where 'time' is something distinct or even entirely separate from that motion. This conception of time is, for instance, the one we find in Aristotle (see Section 1.1).

Let us consider one example offered in Plato's *Timaeus* to articulate the difference I am gesturing at. Critias is ninety years old when he tells about old Athens to the younger Critias, who is ten years old then (21a7-b2). We, with Aristotle, would present the measurement of their age as follows: we (1) employ the planetary revolutions as an instrument to measure (2) time, and in particular, years. Finally, (3) we count how many years measure the life of Critias and younger Critias. In Plato, however, the distinction between (1) and (2) expressed by the notion of clock is rejected, as time is identified with the planetary revolutions. In identifying time with the planetary revolutions, the relation of time-measurement is not any more a three-places relation, but a two-places one. In this relation, planets are not simply instruments to *measure* time, i.e. clocks. They are instruments to *create* time, with their revolutions.

Given that our notion of clock is unintelligible, in Plato's conception, we might wonder how Plato conceives of the objects we refer to as 'clocks', and in what way they relate to time, if not as instruments for measurement.[310] I would argue that time, in Plato's conception, is ontologically not different from a clock in motion, and Mohr is right in this regard: both should be classified as physical phenomena, because of their created, perceivable and kinetic nature. Plato never discusses clocks directly, but we can imagine that their motion would receive a similar treatment to other well-organised phenomena, such as bodies moving to a certain rhythm in music. For instance, in the *Philebus*, at 17d4-5, a dancing body is said to be rhythmical if its movements are of the sort that display enumerable characteristics (ἔν τε ταῖς κινήσεσιν αὖτοῦ σώματος ἕτερα τοιαῦτα ἐνόντα πάθη γιγνόμενα, ἃ δὴ δι' ἀριθμῶν μετρηθέντα). Moving clocks and dancing bodies could be, in principle, analysable in terms of content and structure just as I did in Part III for the planetary revolutions identified with time.

[309] Plato's account is not reductionist in the sense that, for example, Leibniz's was, as for Plato time is not simply defined as a relative order between phenomena, but rather as itself a physical phenomenon, i.e. the planetary revolutions. However, Plato would be a reductionist against the 'absolute time' view, in the Newtonian sense, as it would classify time as a separate dimension of the physical world and unaffected by changes within it (Futch 2008, pp. 29-32).

[310] For references to Plato's familiarity with man-made clocks, see *fn.* 57.

What differs between time and a clock in motion, then, is not their ontology, but rather the scope that time has, compared to clocks: time is a *cosmic* phenomenon, hence concerning the whole of the physical world and all the living beings within it, whereas clocks are, at best, objects displaying a miniature version of that phenomenon, with a limited, or contextual scope. In fact, in my reading, time is constituted by the eight periods of the cosmic soul, as the structured totality of cosmic life. Hence, time is grounded in the uniqueness and all-comprehensiveness of the cosmos, so that time, in turn, provides a single framework for measuring everything that happens within the cosmos, as exemplified above.[311]

Clocks, on the other hand, are a *part* of the cosmos, and while they might be used for a function analogous to the planets, they cannot substitute the cosmic role played by time, because of the inherent locality and circumstantiality of the measurements they allow. To use Mohr's terminology, then, time really is an immanent standard for clocks in Plato's account. Unlike in Mohr's reading, however, the reason to attribute a special status to time is its essentially cosmic dimension.[312]

An upshot for philosophers of time

There is a further significant upshot to the endeavour of reconstructing Plato's conception of time, and it is, once more, a conceptual one. Understanding Plato's conception of time shows how distant a notion it is from the one we are acquainted with. At the same time, however, there are aspects of this account that are philosophically significant, especially in light of what up to date physical theories tell us about the universe. Physicists generally conceive of time as a dimension tied together with the spatial ones, in a space-time manifold. The measurement of a time-interval in the manifold depends on the position in which the measurement is taken and its relation to (significant) masses of other objects.[313] Nonetheless, we can narrow down sections of the universe whose

[311] Time, as a cosmic phenomenon, measures everything in the cosmos (τὴν ἐν χρόνῳ γένεσιν ἰοῦσαν, 38a1-2) and its application is by definition global (ἡμέρα [εἴη] μία καὶ ἡ αὐτὴ οὖσα πολλαχοῦ ἅμα ἐστὶ, *Prm.* 131b3-5).

[312] In this picture, it seems that the most successful clocks are those closely coordinated with the planetary revolutions. Examples of these well-attuned clocks are sundials or even human beings in their sleep-wakefulness alternation, based on the alternation of light and dark originated in the daily revolution of the Sun (*Ti.* 45b-d, *Tht.* 158d). Biological clocks, as human beings are, could be the best example of an imitation of time, although they are not very informative, since they simply mirror the cosmic phenomenon of time in their own internal changes. Pushing this line of thought to the extreme, calendars could be thought of as a blueprint, that, if followed, would make a polis functioning like a well-attuned clock coordinating religious and political events with the visible patterns of the planetary revolutions.

[313] This rough outline of some results stemming from general relativity is not intended to delve in any of the details of today's physical theories, nor to argue that a more systematic comparison with Plato's conception of time would even be possible. It suffices to point out that tensed distinctions are seemingly never questioned by Plato in their absoluteness, independently of whether time exists (see Introduction, *On tense*), whereas in a relativistic framework to admit an universal present is problematic, because of the non-uniformity of the space-time curvature (Zimmerman 2011).

approximately uniform spacetime curvature allows for an approximately shared time-frame. The surface of the Earth, and the macroscopic objects and phenomena surrounding us in our everyday lives are examples of those temporally 'uniform' sections of the universe.

Plato's account of time, despite its archaic commitments in cosmology (e.g. to a living cosmos and to the identification of time and the planetary revolutions), maintains that time is a phenomenon grounded on the cosmic arrangement and its regular motion. As such, Plato's account upholds a thesis about time that only the development of the relativistic theory empirically confirmed: a shared temporal measurement is not a given in the physical world, and must be grounded in a *special configuration* of that world, or of portions of it. Evidently, the special configuration required in Plato's account and in contemporary physical theories is of a completely different kind. However, Plato's conception of time, on the basis of the thesis above, leaves open the possibility of a plurality of time-frames – something that is typically accounted for in contemporary physical theories. In fact, in Plato's account the possibility that the cosmic arrangement had multiple instantiations in different portions of the universe, so that we would end up with many *cosmoi*, is not absurd. In that scenario, however, there would be just as many time-frames.

Although the 'many time-frames' scenario is certainly repugnant to Plato, and he counters the possibility teleologically – with the assumption of a divine maker always pursuing what is best – that scenario *could* still occur in a sub-optimal universe.[314] The Aristotelian objection seen in Section 1.1 is after all outlining that scenario as a reductio: by accepting a cosmological definition, if there were multiple *cosmoi* there would be multiple *times* at once. While deemed a self-evident absurdity by Aristotle, from the point of view of contemporary physics we would rather take the 'many time-frames' scenario as a felicitous consequence of the account, since it more adequately represents the physical world.

The upshot, then, is certainly not to put forth anachronistic claims about Plato being a precursor of contemporary physics with regard to time. It is, perhaps more interestingly, that Plato's account, which appears archaic in many respects, does not commit to certain unwarranted assumptions that later became widely accepted, and that modern science only relatively recently challenged in their alleged self-evidence. In Plato's conception, the uniqueness of time, just as the very possibility of its existence, require to be grounded in the arrangement of the physical world, as

[314] Plato never considers the option of multiple *cosmoi* as one that could be actualised, given that (1) the Demiurge does what is optimal; (2) to make the universe in resemblance of the CILB is the best possible course of action; (3) the CILB prescribes uniqueness and all-comprehensiveness (see Section 3.1). Nonetheless, Plato's account of time would be consistent with a sub-optimal arrangement of many *cosmoi*, each with their own planetary revolutions.

time is non-fundamental. As such, Plato's conception of time provides one more example of how misleading the narrative of a linear progress in the sciences and in philosophy is.

OUTLINE OF PLATO'S ACCOUNT OF TIME (37c6-39e2)

I. Definitional section (37c6-e3)
   a. Intention to make the living cosmos as similar as possible to the everlasting living being (37c6-d2)
   b. Introduction of αἰών and comparative definition of time (37d3-e3)

II. Digression: Tensed distinctions and tenseless present (37e3-38c3)
   a. The mistake of attributing tensed expressions to the everlasting being (37e3-38a1)
   b. Explanation of the mistake: tensed distinctions have their origin in becoming, and thus time has forms that have come to be (38a1-b5)
   c. Comparison between time and αἰών in their relation to the model and the cosmos (38b6-c3)

III. Development of the definition: the creation of time by means of the planetary revolutions (38c3-39e2)
   a. Function and creation of the planets (38c3-e3)
   b. Astronomical section (38e3-39d7)
      i. The planetary revolutions along the cosmic periods (38e3-39b2)
      ii. The creation of the parts of time and the complete year (39b2-d7)
   c. Recapitulation: the planetary revolutions and the cosmic imitation of αἰών connected (39d7-e2)

INDEX OF OCCURRENCES IN THE *TIMAEUS*

A) Χρόνος

41 occurrences of χρόνος, 14 of which in the account of time: 20e5, 21b6, 21d6, 22b3, 22b8, 22d2, 23b3, 25c7, 26a1, 26b6, 26d5, 36e5, 37d7, 37e3, 37e4, 38a2, 38a4, 38a7, 38b6, 38c2, 38c4, 38c6, 38e5, 39d1, 39d4, 39e3, 40c8, 41e5, 42b3, 42d5, 44b4, 47a6, 81c7, 86a7, 89b7, 89c3, 89c6, 90d7, 91a1, 91c3.

Ancient dates and times: 20e5, 21b6, 22b8, 23b3, 25c7, 26b6, 26d5, 91a1.
Time and its course: 21d6, 26a1, 36e5, 37d7, 37e3, 37e4, 38a2, 38a4, 38a7, 38b6, 38c2, 38c4, 38e5, 39d1, 39e3, 47a6.
In association with number: 22b3, 38c6, 39d4.
In association with astronomical revolutions: 22d2, 40c8, 41e5, 42d5.
In association with mortal life: 42b3, 44b4, 81c7, 86a7, 89b7, 89c3, 89c6, 90d7, 91c3.

B) Περίοδος

23 occurrences of περίοδος, 5 of which in the account of time: 34a6, 38c8, 39b5, 39c2, 39c5, 39d5 42c5, 43a5, 43d1, 44a4, 44b2, 44d3, 47a5, 47b7, 47d3, 47d5, 58a5, 76a7, 83a2, 85a6, 86a7, 90d2, 91e5.

The cosmic circles of the Same and the Different: 39c2, 38c8, 39d5, 42c5, 47b7, 90d2.
Planetary revolutions and time: 39b5, 39c2, 39c5, 39d5, 47a5, 86a7.
Motion of the cosmic body: 34a6, 58a5.
The immortal soul of mortals: 43a5, 43d1, 44a4, 44b2, 44d3, 47d3, 47d5, 76a7, 85a6, 91e5.
Bodily cycles: 83a2.

C) Ἀριθμός

19 occurrences of ἀριθμός, 6 of which in the account of time: 23e4, 31c4, 32c1, 36a5, 36b3, 37d6, 38a7, 38c6, 39b6, 39c7, 39d4, 47a6, 53b5, 54d1, 54d4, 54e3, 57d2.

Concrete number: 23e4, 32c1, 36a5, 36b3, 38c6, 39c7, 39d4, 53b5,54d1, 54d4, 54e3, 57d2.
Generic number: 31c4, 37d6, 38a7, 39b6, 47a6.

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