

TIME AND OTHERS TYPES OF DURATION IN PLATO'S COSMOLOGY

O TEMPO E OUTROS TIPOS DE DURAÇÃO NA COSMOLOGIA DE PLATÃO

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Abstract: This article first describes the four types of duration to which Plato seems to have been committed: eternity, sempiternity, everlastingness and time. A description is offered of the very startling type of entropy characterizing the cosmos of the Myth of the Politicus, in which the universe starts from an initial impulse, eventually returns to that point, and then begins the process all over again, in perpetuity. This view is then shown to be compellingly consonant with contemporary cosmological theory.

Key-words: Time; Myth of the Politicus; Eternity; Cosmology.

Resumo: Este artigo descreve em primeiro lugar os quatro tipos de duração que parecem ser sustentados por Platão: eternidade, sempiternidade, perpetuidade e tempo. Uma descrição é oferecida do tipo surpreendente de entropia que caracteriza o cosmos no Mito do *Político*, onde o universo começa a partir de um impulso inicial, eventualmente retorna àquele ponto e então começa o processo novamente, em perpetuidade. Essa perspectiva é então apresentada como sendo irresistivelmente consoante com a teoria cosmológica contemporânea.

Palavras-chave: tempo; mito do Político; eternidade; cosmologia.

In this paper I wish to return to a topic that is never far from my consciousness, and that is the various types of duration espoused by Plato, including temporal duration, and their implications for contemporary cosmological theory. Briefly, these types of duration are:

1. Eternality, or the type of duration enjoyed by the Forms and the Demiurge;
2. Sempiternality, or the type of duration enjoyed by the pre-matter of the cosmos;

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3. Verlastingness, or the type of duration enjoyed by the universe as a totality that is known to our senses;
4. Temporality, or the type of duration enjoyed by any physical object *in* the universe;

For much of this information I shall be drawing initially upon the *Timaeus*. And upon a *Timaeus*, I must quickly add – placing my cards on the table at once – read *au pied de la lettre*, following the path of Aristotle, rather than figuratively, following the path of Xenocrates. That choice is of course worth a paper in itself, but I must simply pass over it here, on the grounds (I hope acceptable ones) that I have written widely on this topic already, and my views (and my defence of those views) can be scrutinized (and scrutinized soon in Portuguese) at anyone’s leisure.¹

First, eternity. This is the manner of duration of the Forms, the duration of a moment without antecedent moment and without subsequent moment, a moment unmeasured and unmeasurable by any measuring device imagined or imaginable. It is a moment of such utter stability that Plato feels the need to coin a special adjective for it, *diaionios*. We might call this eternity 1, for which his basic locution is ‘*to’ einai aei*’.

This, I should add, is his strict usage. At other times he is happy to use adjectives like *aidios* and *aionios*, and his noun for ‘eternity’, by a bold piece of transference from popular usage, is *aion*, a word till then understood by most Greeks simply as something like ‘a very great length of time’.

Closely analogous to this is what I call eternity 2, a manner of duration enjoyed by the Demiurge. In this instance Plato has no private, neologistic adjective to proffer. But he does have a noun, and it is the same noun as for eternity 1, ‘*to’ aei einai*’. What this appears to mean is that the two eternalities share a particular quality of duration (i. e., they are characterized by duration which is purely momentary, without antecedent or subsequent moment), but differ in degree of stability; the eternity of the forms is absolutely and unequivocally stable, that of the Demiurge, if comments Plato makes in *Laws* 10 is to be our guide, is characterized by the *kineseis* of thought and desire.

Sempiternality is the manner of duration of pre-matter, or those ‘traces’ (*ichne*) of matter that make up the real before the cosmos known to the

¹ See, e. g., ROBINSON, T. M., *Plato’s Psychology* (Toronto 1995, 2nd ed.), passim. For an earlier version of my views on types of duration in Plato see ‘The *Timaeus* on Types of Duration’, *Illinois Classical Studies* 11 (1987), pp. 143-151, reprinted in T. M. ROBINSON, *Cosmos as Art Object* (Binghamton University: Global Academic Publishing, 2004), pp. 23-31.

senses came into being. Its manner of duration is what might be thought of as sequential were there to be some measuring device to measure the sequentiality. *Faute de mieux*, it has to be described sequentially for us to get a handle on it at all, and this Plato does, in a famous passage at 52d-53c.

What we need to understand here is that eternity, in both its variations, is a characteristic of immaterial objects only. Sempiternality is its exact analogue in the realm of the physical, and is a characteristic of the pre-matter, and the Space sustaining it, which a) forever into the past 'antedates' (an impossible term, but one also just about impossible to avoid) the *comos* of sense-perception, b) is, as the basis/sustainer now of *formed* matter, co-extensive in time with the duration of that *cosmos*, and c) (were the Demiurge ever to permit the *cosmos* of sense-perception to die – which he apparently will not) forever into the future 'postdates' the existence of the *cosmos* of sense-perception.

To appreciate its analogousness to the eternity of the Forms and the Demiurge, we need of course to contemplate it in its totality. Once we do this we see that under this optic it, too, like eternity, is a manner of duration that can be described as 'existing forever' (*einai aei* – see 52a8, where the locution is used of Space). The only difference between them is that, while eternity is such in terms of the "non-existence" of any antecedent or subsequent moment, sempiternity is such in terms of the "infinity" of the series of antecedent and subsequent moments. Or, to put it in Plato's own terminology, the one is characterized by its "abiding in one 'moment?'" (37d, 6), the other by its subjection to an infinite sequence of moments.

What I call everlastingness is the manner of duration of the *formed* *cosmos*, i. e., a manner of duration characterized by a beginning in time (a moment in fact which is the beginning "of" time), but, by the wish of the Demiurge, without an end in time. As in the case of sempiternality, Plato has no technical term for this, but two important fail-safe locutions allow him to point to it with great clarity anyway, and those are 'enduring forever' (*menein aei*), used of the astral gods at 40b6, and "in motion forever" (*he aei kinesis*), used of the four primary bodies at 58c3, each of them describing items that came into being with the *formed* *cosmos* and co-eval with it.

Before we turn to the concepts of temporality and time, let me stress that what I have been discussing above are fail-safe techniques that guide us to important distinctions. On other occasions Plato is happy to use both the adjectives *aidios* and *aionios* of the eternity of Forms (specifically, of

the world's paradigm, the Form Eternal living Creature) and *aionios* of the everlastingness of the time characterizing the world-as-image once formed. This apparent conceptual sloppiness bothered Cornford, who at 37d7 conjectured *aenaon* (ever-flowing') for the duration of time rather than *aionion*. But the problem seems to be Cornford's rather than Plato's; all Plato needs are his fail-safe devices to guide us to his meaning.

A particularly good example of this lies in his use of the adverb *aei*, which can notoriously, under varying circumstances, be used to cover the entire gamut of types of duration, from eternity to everlastingness, as well as on occasion signifying invariability. So, for example, the world of the Forms is said to exist *aei* (27d6); individual Forms, and specifically that of the eternal Living Creature, is said to exist *aei*; the Demiurge is said to exist *aei* (34a8); Space is said to exist *aei* (52a8); the created gods and the four primary bodies are said to exist *aei* (40b6, 58c3); and a famous passage (27d5-c10) has even been interpreted in terms of a use of the *aei* of invariability.

Once we advert to the various fail-safe techniques I have mentioned, none of this should confuse; in varying circumstances *aei* will be appropriately translated "eternally", "sempiternally", and "everlastingly". Even, as a linguistic possibility, "invariably", as often in standard Greek prose. But not, I think, at 27d5 ff. While it is no doubt a linguistic possibility that Plato may here be distinguishing what is invariably an entity not subject to genesis from an entity invariably subject to genesis, the context makes it clear, I think, that he is really distinguishing the world of Forms, which exists in a state of eternity¹, and never comes into being, from the world of sense-perception, which does.

This notion of invariability has, however, finally led us to the world of time, where *aei* can indeed on occasion be used to describe what is invariably the case, or what is found invariably, throughout a specified period of time. The manner of duration of the world of time, which came into being, by Demiurgic formation, at a point in time which was the beginning "of" time, is that of a sequence of moments, measurable and measured by something of fixed periodicity, a celestial clock fashioned by the Demiurge for just such a purpose. It is not, as Aristotle will later describe it, a number (or perhaps "a numerical measurement") "of" motion, but rather motion subject "to" measurement. In his own words, it is 'an image of eternity, proceeding <on its way> according to number (or perhaps 'according to numerical measurement').

In a post-Kantian world, or in one, closer to our own times, where a number of philosophically laden terms can comfortably be deemed

meaningful but non-referential (Ryle, *et al.*), it may come as a surprise to find Plato suggesting that, far from being just a form of our consciousness or even non-referential, time is in fact a reality subject to motion. And maybe even more of a surprise to find him suggesting, in the same dialogue, that Space, far from being an empty container (as most Greeks of the day thought), or pure extension (Descartes), or a form of our consciousness (Kant), or yet another non-referential term (Ryle, *et al.*), it was, like time, also in motion, though this time in sempiternal motion, like that of its contents, the 'traces' of matter.

What is the nature of these two realities, the one, time, described as "everlastingly" moving in a numerically measured circle (38a7-8), the other, Space, as "sempiternally" moving and being moved by its own contents? In the latter case, that of Space, Plato is clearly puzzled, and he is reduced to calling it the object of a "bastard reasoning", teetering on the edge, as it does, of the eternity of the non-physical and the sempiternality of its physical contents, the traces of matter. If it were an eternal Form, and immaterial, which it is not, it would of course be the object of reasoning. But it is not a physical object either, which might have led to its being describable as an object of opinion rather than reasoning. Instead, it enjoys the durational equivalent of eternity (cf. the phrase *aei einai*, 52a8) in the realm of the physical, and at the same time the quasi-physicality of a non-perceptible and non-dimensional sustainer of what in the pre-cosmos will be described as the physical-like and in the formed world, the physical.

As the poet puts it, at this point words "crack and break under the strain", and Plato comes up with a unique epistemological locution, "bastard reasoning", to deal with the matter. But nothing analogous is said of time, and we are left to conjecture whether he would have spoken in similar terms of it had he chosen to discuss the matter. What he does say is that things like days and nights are 'parts' of time, and that past, present and future are "types" or "forms" (*eide*) of time. But whether time is "knowable" or not, and if knowable, in what way, he does not say.

But one can, I think, reasonably speculate on the position he might have taken in the matter. Like Space, time is not a physical object. And like Space, it shares a major feature of the physical, that is, its subjection to motion in the realm of the physical. On these grounds one might be tempted to think that Plato would have described it, had he chosen to speak on the matter, as being, like Space, the object of a "bastard reasoning". But I think the temptation should be resisted. Space is sempiternal in duration,

and to that degree more analogous to the world of eternal immaterial Forms than to the formed universe, which is merely everlasting. Time by contrast is if anything more analogous to the everlasting “physical” universe of which it is a feature, and any knowledge we have of it would consequently be closer to opinion than to reasoning, given Plato’s views on the necessarily immaterial physical objects of reasoning and the necessarily physical objects of opinion, as expressed in detail in the *Republic* and repeated here in the *Timaeus*.

So Time would presumably have been called by Plato the object of a “bastard opining” of some sort. Would this involve calling into question the truth of his description of it? Not necessarily. If our knowledge of Space is something *less* than our knowledge of the eternal world of Forms, our opinion about Time is something “more” than our opinion about the everlasting world of the senses. In each instance what produces the bastard nature of the state of consciousness in question is the fact that the object of consciousness in question, while displaying the stability of objects, Formal or physical, is not in fact like any other Formal or physical object: Space is neither a Form nor a physical object, and the world of the senses opined by Time is, unlike any other putative physical object, one with no physical context.

What is interesting here, I think, and brings together the concepts of Space and Time in a very alluring way, is their stability, parasitic in each instance upon the universe each inhabits. If Space is knowable, albeit with a quality of knowledge something less than knowledge of the world of Forms, it is because it has something approaching the stability of the world of Forms. In like fashion, if Time is opinable, it will be with a degree of Opinion considerably more stable than our opinions of ordinary sense objects, since the everlasting world of the senses is not, as a sense-object (and Plato, a little disconcertingly, believes it is a sense-object), subject to change in the way any objects “composing” it are subject to change. So the opinion in question will, paradoxically, be something “more” than what Plato calls “true” opinion, its bastard nature being entirely a function of Time’s real but non-objective status, just as the bastard nature of our “knowledge” of Space is a function of “its” real but non-objective status.

This is heady stuff, but it would be a mistake to think that it is Plato’s last word on the subject. For something even more challenging, we need to look at the notions of entropy, the apparent “reversibility” of time, and the temporal evolution of human form, in the myth of the *Statesman*, and to this I now turn. Here we have an apparent cosmology which shares a

few of the features of the cosmology of the *Timaeus*, and we can begin the discussion by simply listing them.

1. From a state of chaos or confusion or disorder (*ataxia*) the Demiurge produced a world of some sort of order
2. The world formed by the Demiurge is characterized by the possession of rational soul. This rationality is constrained by what *to somatoeides* (“the bodily”, or, perhaps better, “the physical”) permits, and this seems to be the equivalent of what was called *Ananke* (Necessity) in the *Timaeus*.

As a paradigm, or set of paradigms, for his fashioning of the world the Demiurge appears to use Forms (referred to slightly vaguely as “the divine realities” [*ta theia*]). While Plato offers no further details on this, I have argued elsewhere (3) that we can legitimately infer from what he says that, as in the *Timaeus*, the Forms can be understood as being eternal, matter and space as sempiternal, and the fashioned world as everlasting. Within that fashioned world all sense objects exist in time.

But at this point an astonishingly new idea puts in an appearance. The world of our senses, it turns out, once set in motion by a push from the Demiurge, turns on its axis to a point when it can turn no more, and proceeds to spin backwards till it reaches the state of inertia from which it had begun. At which point the Demiurge gives it another push, and the process starts all over again, apparently everlastingly.

The model Plato uses to describe this phenomenon is that of an orrery, anchored to a pivot on the floor and tied to the ceiling of a room by a cord. The so-called “forward”, or original spin comes to a halt when the cord has tightened to its utmost, at which point the backward spin takes over to the point of a maximum loosening of the tension, leading to a second halt, a fresh push to restart the process, and so on.

Each “unwinding” process, it should be added, involves a reversal of time, and a reversal of history, biological and otherwise. In Plato’s description, creatures eventually grow not older but younger (270d-e), they become “diseased” and “broken apart”, and also gradually smaller in size, such that they eventually ‘risk disappearing’ altogether. It is, in fact, the periodic ‘dying’ of the universe, which is then restored to life by another push by the Demiurge in a “forward” direction. Where we are at present appears to be on one of universe’s “backward” spins.

What has happened? Has Plato lost his senses? Well, not really. He has, rather, between the writing of the *Timaeus* and the *Statesman*, realized that no satisfactory cosmology can possibly be formulated unless it takes account

of what we have now learned to call the second law of thermodynamics. He was clearly aware of this law in our own micro-environment, as his description in the *Republic* of what happens to a spinning top demonstrates. And he is also fully aware of it in the *Timaeus* too, though its cosmological implications seem to disturb him. So much so that, confronted with the natural possibility that the universe, being, as he thinks it is, a physical object just like any other physical object, will be subject to entropy just like them, and finally cease to be, he recoils at the possibility and says bluntly that the *fiat* of the Demiurge will not allow it.

Why he might have thought this is certainly an interesting question. Perhaps this was another instance to him, like the possibility that the universe might have had a created model rather than an eternal Form (*Tim.* 29a), of a possibility that it is blasphemous (*ou themis*) even to formulate in words. But in the context he makes no comment.

The next time we find him broaching the matter, however, in the *Statesman*, a major new subtlety has been introduced into the equation, and entropy, by extrapolation, for the universe as a whole is now taken to be a reasonable cosmological expectation. Like any other physical object in motion, the universe will, it is said, periodically run down. But, differently from any other physical object, it will also be subject to the divine *fiat* of everlastingness he had mentioned earlier on in the *Timaeus*. So each death will co-incide with a new birth, by a specific divine intervention, and so on in perpetuity. And the everlastingness of things will now involve, not the single rectilinear sequentiality of the world we know, but an infinite number of births and deaths of such worlds, each subject to the second law of thermodynamics and each needing divine intervention to restart the process.

Bizarre as Plato's detailed view of all this, in terms of supposedly forward and backward world-rotations, may have sounded till fairly recently, they have in fact become part of relatively commonplace thinking for contemporary cosmology. There is large scale agreement among cosmologists that the universe is indeed, as Plato said, finite; that it has a beginning in time which is the first point "of" time; that it is in state of outward motion (in some sense of the word 'outward' that has to be accommodated to four-dimensionality); that there is some possibility that, having reached its outermost limit for expansion, it will begin a tumultuous journey back to the primal atomic state form which it began; that another Big Bang could restart the process of expansion; and that his process could go on everlastingly. I make no claims for the truth of these postulations,

of course; I merely mention them to indicate how large numbers of contemporary physicists are now espousing theories remarkably congruent with what Plato says in the so-called 'myth' of the *Statesman*, and clearly finding them in now way bizarre or eccentric.

Aided by the enormously liberating influence of the concept of quadri-dimensionality, modern science can now of course imagine (or at any rate talk about) a universe that is finite but unbounded, something inconceivable to the Greeks. With this as a tool, they can postulate an oscillating universe conceived of in terms of everlasting expansion and contraction. Denied this tool, but finally adverting to the second law of thermodynamics, Plato, within the constraints of a purely three-dimensional view of things, comes up, in the *Statesman*, with a theory as plausible, I would say, in its time as the Big Bang theory seems to be to so many physicists today.

Granting to Plato, *argumenti causa*, that the universe is, not just finite, but also itself a physical object (a much more difficult pill to swallow, I grant), and that any putative oscillation to which it might be subject will need to take place within the confines of its three-dimensional circularity, the Platonic world will oscillate everlastingly in the only way left to it, that is, in temporal sequentiality and within the framework of its axial rotation. Which is exactly of course what the *Statesman* account says it does.

But surely talk about reversal of time and history, it might be objected, is simple nonsense, and not worthy of further comment. Maybe. But it is worth pointing out the even Stephen Hawking believed for a while that, if the Oscillation theory of the universe is soundly based (as he thinks it is), then during the period of the Great Return (or Big Crunch) we can expect a complete reversal of time and history, in which broken cups will be re-constituted, and the like. I quote him not because what he says seems plausible; it does not, and he abandoned this notion, I'm happy to say, soon after he formulated it.² But it is a natural avenue of speculation to explore, once one is into cosmologies of this order.

Part of Plato's own exploration fascinatingly involves what - unlike Aristotle - he takes to be human evolution through time, and in particular our evolution from an antecedent state of non-sexed forms to our current state. The Demiurge did not, it is claimed, create us as beings already equipped with sexual organs; that came later, in the early stages of the world's first backward rotation.

² HAWKING, Stephen, *A Brief History of Time* (New York: Bantam Books), chapter 9.

We can, I think, pass over the details of this. What is more important is to ask “why” Plato might have argued in this way. Why did he want to say that the world of temporal process is a world involving major evolution in how its supreme creature, *homo sapiens*, came to be? He had, as it happens, already hinted at this in a little-read passage of the *Timaeus* (90e ff), where (on one interpretation at any rate) the first humans were what I think might be appropriately called ‘psychological males’ only, unpossessed of sex organs. It was only in a second generation, after a virtuous or less than virtuous life as psychological males, that the virtuous returned as biologically equipped males and the non-virtuous as biologically equipped females, and human reproduction as we know it began.

But let us return to the question of why he might have had any such thoughts about time and human history. A good way of getting at the answer seems to me to lie in looking at a contrasting view, that of the nineteenth century biologist Philip Gosse.³ In his extraordinary book *Omphalos* he asked the question whether Adam, in another famous text which appears to state unequivocally that the world was fashioned by a Maker, had a navel or not. If he did not, then there was reason for thinking he wasn’t fully human; humans have navels. But if he did have navel, he bore on his body the marks of a biological history he had never experienced, and in this sense his Maker was deceiving us.

As a devout Christian, but also a biologist who did not believe in evolution, Gosse was between a rock and hard place; either solution to the question he had posed himself had its problems. He finished up opting for the view that Adam “had” a navel, arguing further that, if this is a reasonable thing to believe, there is no reason to doubt that, in similar fashion, God might also have filled the earth with fossils that represent a history of the “cosmos” that had never taken place. As for any question ‘Why?’ that might be asked, we must console ourselves with the answer that the ways God wishes to test our faith are many, and this is just one of them.

Plato, it seems to me, faces a similar problem, but more plausibly opts for the very opposite conclusion to the one drawn by Gosse. If, at the beginning of what from then on would be called time, he seems to be saying, the Demiurge fashioned a cosmos or set of cosmoi, and also fashioned humans at that same beginning, then there is no reason to think those humans would be equipped with sexual organs, since such organs would

³ GOSSE, Philip, *Omphalos* (London, 1857).

suggest a biological history they had never in fact had. Sexual differentiation, and with it the sexual generation of the race, would come later on in the process – a point made in clearly in the *Statesman* and very possibly also in the *Timaeus*, as we have just seen.

In all of this we have reached the greatest height of Plato's cosmological imaginativeness, a height where he is I think comparable to the greatest cosmologists and philosophers of science. After this, in the *Phaedrus* and *Laws*, he moves in another direction, with a newly formulated doctrine of soul as self-activating activity that leaves no room for a world of time originating and operating within a context of everlastingness. From this point on time will be seen by him as simple rectilinear sequentiality within a context of cosmic sempiternity. And this, I am pained to say, seems to me to constitute a significant and unfortunate step backwards in his cosmological thinking. But that is another paper.

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