

Chapter 2

Physics iv 10-11 as a Parallel Account

Given the context of the *Physics* just explored, it will not be a surprise if time (*chrónos*) in Aristotle's analytic of time turns out to be not a being *qua* itself but an attribute of motion,¹ an interval.² First, let us take seriously 218a1, a rather neglected line in the treatise,³ where Aristotle qualifies two types of time—*ho apeiros chrónos*, or infinite time, and *ho aei lambanamenos chrónos*, or taken time—suggesting that *chrónos* is homonymous—naming two different senses of time. It should be highly unlikely that *chrónos* in the *Physics* means infinite time—in brief, infinite time is outside the scope of the *Physics*, in so far as the *Physics* is principally concerned with the nature of natural beings and the allusions to infinite time seem relegated to *Physics* iv 10, where Aristotle works through the doxa. Thus, I turn to Chap. 11, what I call Aristotle's "analytic of time," where Aristotle first defines *chrónos*, to

¹Interpreting *Physics* iv 11 is difficult, and the literature is divided on interpretation. I agree with Shoemaker 1969, Sorabji 1983, Hussey 1981 that time for Aristotle requires perception of *kinêsis*. Roark (2011, 56) claims that readers of Aristotle in this camp have not defended why Aristotle would hold this view here in the Treatise on Time but nowhere else. My defense is twofold: (1) I read the Treatise on Time as highly contextualized and parallel in structure to Aristotle's foregoing arguments about the terms of *kinêsis*. Time, like the infinite, place, and void is not considered a being *qua* itself in Aristotle's philosophy of nature here in the *Physics*. In short, this is an account of time relevant to an inquiry into the being of natural beings, i.e., an account of time taken. Recall, the Treatise on Time may have been the end of Aristotle's initial work on nature; (2) It is not the case that Aristotle does not at least assume this view in other works of his natural philosophy. I will look to some of these works in the final chapter.

²Already, in the very idea of "the time taken," there is a nod to the fact that time requires a "taker." Otherwise, time cannot be "taken." This seems a foreshadowing of the subsequent arguments about time and the soul in *Physics* iv 14.

³Namely, while there is literature discussing the difference between the two Greek times, *chrónos* and *kairos* (see for example Moutsopoulos 2010; Smith 1969), thus an acknowledgment that there was more than one sense of temporality for the Greeks, there has been no sustained discussion about the fact that *chrónos* itself seems to be a homonym—naming two different senses of time.

argue that time for Aristotle is a time interval, insofar at its actual existence depends on the motion of natural beings; it is not an a priori or self-subsistent being.⁴

Chapter 10 of the *Treatise on Time* is analogous in purpose to the initial chapters of each foregoing treatise, e.g., on the *archai* of nature, *kinēsis*, the infinite, place, and void.⁵ Namely, it serves to discuss the *endoxa* as preparatory to Aristotle's actual analytic of time, which begins at 219a1–3: "It is evident, then, that time is neither movement nor independent of movement. We must take this as our starting-point and try to discover—since we wish to know what time is—what exactly it has to do with movement" ("Οτι μὲν οὖν οὔτε κίνησις οὔτ' ἄνευ κινήσεως ὁ χρόνος ἐστί, φανερόν).⁶ In this chapter, I trace the development of Aristotle's analytic from this starting point until he both defines *chrónos* at 219b1 (ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον) and then, after some argument, reaffirms his definition at 220a25 ("Οτι μὲν τοίνυν ὁ χρόνος ἀριθμὸς ἐστὶν κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον). I attempt to show, by way of a proposal that the "now" for Aristotle is not only (1) non-temporal, as Coope (2005, 29) has suggested, but also (2) a referent for existing self-subsistent natural beings undergoing *kinēsis*, i.e., a referent to their modality, that the best reading of this analytic is to understand Aristotle's position on time to be that time is only ever potentially actual, and by consequence only ever potentially a continuum, unless it is apprehended as such. I support this reading in part by contrasting the way Aristotle dismisses that time could be a self-subsistent being composed of actual parts in *Physics* iv 10, and then argues that time is in some sense continuous, i.e., presumably a whole composed of parts, in Chap. 11.⁷ I treat *Physics* iv 10 in both Sects. 2.1, and 2.2, in Sect. 2.3, I consider *Physics* iv 11.

⁴Ultimately, I agree with Roark that the before and after is non-temporal in Aristotle's account, thus with Coope that the business of numbering the before and after entails counting "nows," implying that "now" too is non-temporal; but, I will depart from Coope insofar as she argues that, "... there must be some *other* continuum, prior to time, on which the now depends for its existence" and that the other continuum is change, and instead propose that the other continuum—in line with the greater context of Aristotle's *Physics*—is a "this," the self-subsistent existing natural beings, "the matter" undergoing the change.

⁵Coope (2005, 17) also mentions the similarity in structure between the beginning of Aristotle's *Treatise on Time* and the way he began his account of place (209a2) and his account of the infinite (iii 4–5), but adds in n. 1 that while puzzles about the infinite are answered by Aristotle (iii 8), he wrongly claims that he has solved all of the puzzles about place at 212b22–23. Coope refers her reader to Ross (1936, 564).

⁶Roark (2011, 53) supports the theory that *Physics* iv 11 begins Aristotle's analytic of time, in Roark's words, "Aristotle's positive account of time."

⁷I offer a reading of *Physics* 11 despite that the order of arguments is challenging to understand in a coherent way (see for example Hussey (1983, 145) on the strange arrangement of the section).

2.1 Introducing the Issue of Time

Aristotle begins his Treatise on Time as he did with the other terms of motion see Chap. 1 fn 26; he will examine the *endoxa* and attempt to understand the difficulties of his subject—here, time (217b29–30).⁸ Commentators commonly refer to such difficulties as the “paradoxes” or “puzzles” (*aporiai*) of time:⁹

- (1) Does time exist or not?
- (2) What is the nature of time?

Aristotle first considers the arguments for the non-existence of time. Or, if not the non-existence of time, the relative obscurity of whatever time is (ὅτι μὲν οὖν ἢ ὅλως οὐκ ἔστιν ἢ μόλις καὶ ἀμυδρῶς, ἐκ τῶνδὲ τις ἂν ὑποπτεύσειεν) (218a1–2). He implies that time is a whole composed of parts when he brings up the commonly known “parts” (μέρη) of time: past and future. Past does not exist because it “has been and is not,” and the other part “is going to be and is not” (τὸ μὲν γὰρ αὐτοῦ γέγονε καὶ οὐκ ἔστιν, τὸ δὲ μέλλει καὶ οὐπω ἔστιν) (218a2–3). But, then, curiously, Aristotle backtracks to state that any time “is made up of these” (218a4). Aristotle continues to argue that since in order for something divisible to exist it is necessary that all or some of its parts exist, but then seemingly exempts time from this conditional saying: “but of time some parts have been, while others are going to be, and no part of it is, though it is divisible” (τοῦ δὲ χρόνου τὰ μὲν γέγονε τὰ δὲ μέλλει, ἔστι δ’ οὐδέν, ὄντος μεριστοῦ) (218a5–6). For Plato, in the *Timaeus*, days, nights, months, and years are all parts (μέρη) of time; the past (what “was”) and future (what “will be”) are not parts, but forms (εἶδη) of time (37e). It is thus unclear, if Aristotle is appealing to *endoxa* here, the source of the idea that “past” and “future” are parts of time. If Aristotle is not appealing to *endoxa*, the argument is circular. This is to say that if Aristotle is positing non-existent parts of time as a premise whence to conclude that time does not exist, he has already assumed that time is a whole, thus is composed of parts. The idea that time is a whole is problematic when we consider the arguments Aristotle has just made with regard to the kind of being he attributes to the infinite, place, and void. These are terms of *kinêsis* and not actual self-subsistent beings. Why then might Aristotle begin his Treatise on Time with the assumption that time is a whole?¹⁰

⁸Εχόμενον δὲ τῶν εἰρημένων ἔστιν ἐπελθεῖν περὶ χρόνου· πρῶτον δὲ καλῶς ἔχει διαπορῆσαι περὶ αὐτοῦ καὶ διὰ τῶν ἐξωτερικῶν λόγων, πότερον τῶν ὄντων ἔστιν ἢ τῶν μὴ ὄντων, εἴτα τίς ἢ φύσις αὐτοῦ.

⁹Coope (2005, 17) adds Aristotle’s subsequent question, “What is time’s relation to the present, or ‘now’?” to the puzzles.

¹⁰Aristotle will argue in *Physics* 11 that time is continuous. Since the essence of continuity for Aristotle is that something is a whole with parts, that these parts are touching, and that there is the potential for infinite divisibility of the whole, it makes sense that he begins with this assumption. But, if his Treatise on Time is an investigation in the same vein as his previous queries into the terms of *kinêsis*, i.e., in the form of APO ii 1, 89b24–5, and beginning with *endoxa* in the order of explanation and proceeding to demonstrate that the term of motion is not a self-subsistent being

Aristotle clarifies that there are two ways to think about time: (1) infinite time (ἄπειρος χρόνος), and (2) time taken (λαμβάνόμενος χρόνος) (218a1). Now, Aristotle has already shown that the infinite exists only to the extent that the potentiality for it exists, e.g., in the possibility for infinite divisibility. What are we then to make of the idea of “infinite time,” mentioned here without explanation or definition?¹¹ Aristotle’s reference to infinite time could mean two things: (1) a reference to the “time” of his predecessors, that is, to Platonic time, whose emphasis on number may be traced back to the Pythagoreans,¹² or (2) an idea, whether from Plato or elsewhere, presupposed about the possibility for endless time (*aion*),¹³ given that certain heavenly motions seem to be ceaseless and that the possibility exists (at least in the intellective faculty of the soul) for motion qua motion to continue forever.¹⁴

(Footnote 10 continued)

itself, this assumption seems impetuous. If Aristotle’s puzzles are not just rhetorical, how can we assume something is continuous when we have not yet established whether or not it exists? Indeed, in her reply to Miller (1974, 139–141), Coope (2005, 20) raises a similar point when she says that Miller’s suggestion that the puzzles of time could have been solved if Aristotle had said, “to be is to be surrounded by time” would not work because assuming that being is surrounded by time is to already assume that time exists, and whether or not time exists is the question Aristotle poses. Yet, Coope does not raise this same issue with regard to Aristotle’s assumption that time is a whole composed of parts, i.e., is continuous.

¹¹Coope (2005, 81) cites *Generation and Corruption* (338b9–11) to argue that Aristotle elsewhere posits “a pretemporal order that is both infinite and (in the relevant sense) linear,” and she believes that Aristotle could have used this notion in the *Physics* to provide a temporal basis for the before and after, thus defending “his assumption about time’s linearity.” I will discuss shortly that Aristotle did not need a temporal basis for the before and after in his account of time in the *Physics* and that in fact before and after are not inherently temporal concepts.

¹²In the *Timaeus* 37d–38c, Plato defines time (*chrónos*) as a type of number: as the number according to which the universe, or Living Creature, moves (ποιεῖ μένοντος αἰῶνος ἐν ἐνὶ κατ’ ἀριθμὸν ἰούσαν αἰώνιον εἰκόνα, τοῦτον ὃν δὴ χρόνον ὀνομάκαμεν) (37d) and as that which “imitates eternity and circles according to number” (κατ’ ἀριθμὸν κυκλουμένου γέγονεν εἶδη) (38a). Later, he affirms that there are numbers of time (38c). So, he appears to be inconsistent regarding the relationship between time and number. The universe, or “Living Creature” has a mostly eternal nature, but cannot be fully eternal due to the fact that it was created. That which comes into being must also perish from being. So, it is said to have been modeled after eternity; yet, it is truly sempiternal. As such, despite having been generated, it will be for all time. As Helena Keizer (Keizer 1999, 88) points out, Aristotle seems to be referring to the *Timaeus* 38c1–3 in *De Caelo* i 10, 280a28–32. Here, Aristotle questions the idea that something can be both generated and existing for all time. In short, Aristotle calls into question the whole notion of creation. Cf. also *Physics* viii 1 251b15–20 where Aristotle challenges Plato’s claim that time was created.

¹³Keizer (1999, 90) highlights the sense in which *aion* cannot be endless, i.e., it is “a completeness which is an end (*telos*) in all its fullness.”

¹⁴Plato makes the connection between motion and time already in the *Timaeus* when he concludes that these things becoming in the world of sense do so in time. Time (*chrónos*) is the circling number, which imitates eternity (*aion*) (ἀλλὰ χρόνου ταῦτα αἰῶνα μιμουμένου καὶ κατ’ ἀριθμὸν κυκλουμένου γέγονεν εἶδη) (38a).

If time as infinite refers to that which is unchanging and not becoming, it is not the kind of time we would expect Aristotle to discuss in the *Physics*.¹⁵ We have seen his emphasis on becoming from the beginning of the work. Contrast that with the fact that there has been no mention whatsoever about the unchanging movement of the heavens.¹⁶ Indeed, it would be beyond the access permitted to the natural scientist. This ever-continuous time is not the time, which is a term of *kinêsis* insofar as it refers to the nature of natural beings. Instead, it might be a subject for a more speculative thinker, perhaps a cosmologist. In both cases, then, the idea for infinite time (*ἄπειρος χρόνος*) is outside the scope of Aristotle's arguments here in the *Physics*; they would be beyond the scope, access, method, and goals of this inquiry.¹⁷ Instead, Aristotle will focus on time that becomes an issue for us because it is a term of *kinêsis*—the time of this sort is a time interval—time taken (*λαμβάνόμενος χρόνος*).

2.2 Eschewing the *Endoxa*

First, Aristotle investigates what appears to be a third part of time, the “now.” But, “now,” what we commonly think of as the present tense of time, is not going to be a part of time for Aristotle. Parts, he instructs, are measures of wholes, and parts themselves have parts (218a6–7). But, time for Aristotle is not made of nows, at least in the temporal sense. Aristotle is rejecting the idea that time could be represented as a string of points. We could imagine a string of beads to illustrate this commonly held view of time. Placing a finger on one bead isolates it as the “present”—whatever beads exist to the left of the finger are “the past,” and the beads to the right are “the future.” In one's actual experience of life, the now seems elusive. When can it be said actually to occur? Is it now? Now? Now? How about, now? No, it is always already gone. The future slides into the past before we can really acknowledge it. It takes great intention to experience each moment as it arrives.

But, this is not at all how Aristotle is thinking of “now,” precisely because for him time is not going to end up being a linear continuum existing as a subsistent being itself, independent of natural objects. The treatment of what are commonly

¹⁵Though some have argued that *aion* is timeless (cf. Sorabji 1983, 126 n. 122 where he mentions von Leyden 1964; Keizer 1999, 89), Sorabji (1983, 126–127) appeals to *De caelo* i 9, 279a12–b3 to argue that Aristotle does not mean “timelessness” when he writes *aion*; but, rather, “everlasting duration.” This is not to say, as Sorabji concludes, that Aristotle considers “possessors of this sort of *aion*” to be in time. Instead, Sorabji notes the “special sense” of time that Aristotle presents in the *Physics*.

¹⁶Aristotle will of course famously broach this topic in *Physics* viii, but one could argue that, in the spirit of many of Aristotle's treatises, the topics of the last book are preparatory to a subsequent topic of study. On this reading, Aristotle prepares us for the *de Caelo* at the end of the *Physics*.

¹⁷Sorabji (1983, 126) has noted that it does not seem that infinity can be a number. When this conclusion is then accepted as a premise here, since time is going to end up being a number (*arithmos*) for Aristotle, the idea that time could be both a number and infinite is self-contradictory.

held to be “parts of time,” i.e., past, present, and future, then is meant to show the absurdity of understanding time in this way—if not the absolute illogicality, at least that such an understanding of time does not derive from the preceding theory of nature. Aristotle easily demonstrates that the past and future do not *actually* exist, i.e., we can clearly think about them, but they cannot be perceived, and now Aristotle sets out to understand “now.”

He writes that the now seems to be bound by past and future and then wonders whether it is always the same or each time different (218a9–10). The arguments he then puts forth to show that neither is possible are not arguments made in earnest. On the contrary, he is disclosing the logical inconsistencies required to understand the present, “the now,” as an actual part of time *qua* self-subsistent being. After giving arguments against each possibility, he concludes that there are “difficulties about the attributes of time” (περὶ μὲν οὖν τῶν ὑπαρχόντων αὐτῷ τοσαύτ’ ἔστω διηγορημένα) (218a30).¹⁸ At this point in the text, this conclusion is easy to infer. There are clearly internal inconsistencies with the position that holds time to be a whole, composed of two parts that do not exist, and the now, which is not a part but acts as a marker between the two parts that do not exist, and is neither always the same, nor always different. Aristotle is peeling us away from holding the traditional view of time as a being itself, presupposed in our common understanding of nature and nudging us toward an internally consistent, sound, view of time as the “time taken.” The reasoning here is the same type of reasoning Aristotle employs to explain accidental change. Things neither stay the same nor are ever different. Because in the *endoxa*, the now appears to be a part of time, or it is commonly talked about as if it were, Aristotle has to debunk this notion. Before demonstrating by analogy the impossibility of the now as ever same or as ever different, he defends the view in terms of the *endoxa*, i.e., as if the now were a being *qua* itself, a part of the whole of time (218a12–29).¹⁹ Since Aristotle has established that the “parts” of time are not simultaneous—the past always has been and the future always will be, the now has always just ceased to be. We can verify this with experience. *When is the now?* Is it now? Now? Now? So, if the now has always just

¹⁸“Attributes” is not a perfect translation of τῶν ὑπαρχόντων, literally “posessions.”

¹⁹ὁ δὲ χρόνος οὐ δοκεῖ συγκεῖσθαι ἐκ τῶν νῦν. ἔτι δὲ τὸ νῦν, ὃ φαίνεται διορίζειν τὸ παρελθὸν καὶ τὸ μέλλον, πότερον ἐν καὶ ταῦτόν ἀεὶ διαμένει ἢ ἄλλο καὶ ἄλλο, οὐ ῥάδιον ἰδεῖν. εἰ μὲν γὰρ αἰεὶ ἕτερον καὶ ἕτερον, μὴδὲν δ’ ἐστὶ τῶν ἐν τῷ χρόνῳ ἄλλο καὶ ἄλλο μέρος ἅμα (ὃ μὴ περιέχει, τὸ δὲ περιέχεται, ὥσπερ ὁ ἐλάττων χρόνος ὑπὸ τοῦ πλείονος), τὸ δὲ νῦν μὴ ὄν πρότερον δὲ ὄν ἀνάγκη ἐφθάρθαι ποτέ, καὶ τὰ νῦν ἅμα μὲν ἀλλήλοις οὐκ ἔσται, ἐφθάρθαι δὲ ἀνάγκη αἰεὶ τὸ πρότερον. ἐν αὐτῷ μὲν οὖν ἐφθάρθαι οὐχ οἶόν τε διὰ τὸ εἶναι τότε, ἐν ἄλλῳ δὲ νῦν ἐφθάρθαι τὸ πρότερον νῦν οὐκ ἐνδέχεται. ἔστω γὰρ ἀδύνατον ἐχόμενα εἶναι ἀλλήλων τὰ νῦν, ὥσπερ στιγμὴν στιγμῆς. εἴπερ οὖν ἐν τῷ ἐφεξῆς οὐκ ἐφθαρταὶ ἀλλ’ ἐν ἄλλῳ, ἐν τοῖς μεταξὺ [τοις] νῦν ἀπείροις οὐσιν ἅμα ἂν εἴη· τοῦτο δὲ ἀδύνατον. ἀλλὰ μὴν οὐδ’ αἰεὶ τὸ αὐτὸ διαμένειν δυνατόν· οὐδενὸς γὰρ διαιρετοῦ πεπερασμένου ἐν πέρας ἔστιν, οὔτε ἂν ἐφ’ ἐν ἧ συνεχὲς οὔτε ἂν ἐπὶ πλείῳ· τὸ δὲ νῦν πέρας ἔστιν, καὶ χρόνον ἔστι λαβεῖν πεπερασμένον. ἔτι εἰ τὸ ἅμα εἶναι κατὰ χρόνον καὶ μήτε πρότερον μήτε ὕστερον τὸ ἐν τῷ αὐτῷ εἶναι καὶ ἐνὶ [τῷ] νῦν ἔστιν, εἰ τὰ τε πρότερον καὶ τὰ ὕστερον ἐν τῷ νῦν τοῦδ’ ἔστιν, ἅμα ἂν εἴη τὰ ἔτος γενομένα μυριοστὸν τοῖς γενομένοις τήμερον, καὶ οὔτε πρότερον οὔτε ὕστερον οὐδὲν ἄλλο ἄλλου.

ceased to be, then that means it did exist. But, in what sense could it have existed? If it did not cease to be in itself, it might have ceased to be in another now. But, then, the now would be simultaneous with another now, which is impossible if both the now is a part of time and the parts of time do not exist. If “nows” cannot be simultaneous, it follows that when the present now “is,” the prior now must have ceased to be.

But, neither can the now be always the same. Aristotle argues that since no determinate divisible thing has a single termination despite the ways it is extended, and, since the now is like a point, indivisible, the now is a termination. So too, it is possible to cut off a determinate time. And, as a negative account, if the now were always the same, what happened in the past would be simultaneous, i.e., “now,” with what has happened subsequently. Therefore, the now cannot be always the same.

The arguments against the possibility for ever-different nows suggest, on the one hand, that the “now” does not actually exist. From the argument, since the now never actually existed, the prior now cannot have ceased to be in itself. The now cannot cease to be in itself because this entails that it must have existed. But, Aristotle never denies that the now exists. As we noted, it seems demonstrable by way of perception, even if the perception requires intention, to show that it does. But, he understands it as akin to a point, i.e., without parts itself. If it cannot have parts itself, then it cannot be part of a whole. Thus, as we saw, it is not a part of time.

Aristotle thus intends that the “now” is neither always the same, nor always different. Following which, he openly dismisses the “difficulties” dealt with in this preliminary chapter and remarks that, “the traditional accounts give us as little light as the preliminary problems which we have just worked through” (ὁμοίως ἔκ τε τῶν παραδεδομένων ἀδελόν ἐστιν, καὶ περὶ ὧν τυγχάνομεν διεληλυθότες πρότερον) (218a31–32).

Aristotle proceeds to challenge the *endoxa* explicitly—(1) time is a movement of the whole; (2) time is a sphere; (3) time is motion and a kind of change. He readily dismisses the first two. Regarding the first view,²⁰ Aristotle responds that part of the *kinēsis*, or revolution, is time as much as is the whole (218b2). On the other hand, if time were the *kinēsis* of the whole and if there were more than one whole, each one revolving would be time. Aristotle waves this off as nonsensical, since this would allow for the existence of multiple times at the same time (218b4–5).

Regarding the second view that time is the sphere of the whole itself,²¹ Aristotle supposes that this idea is based on the logic that (1) all things are in the sphere of

²⁰According to Ross (1936, 596), this is a reference to Plato’s *Timaeus* 37c–39e, specifically 39d1. This is also reported by Eudemus, Theophrastus, and Alexander (Simplicius 1895, 108), specifically 39C (Simplicius 1895, 111).

²¹According to Hussey (1983, 141) this is a reference to Pythagorean DK 58 B 33 or Aetius I.21, 1. According to Ross (1936, 596), Simplicius attributes it to Pythagoreans by way of a misreading of Archytas by Iamblichus “*diasteima teis tou pantos phuseos*.” According to Simplicius (1895, 108), this is something attributed the Pythagoreans, who may have misinterpreted what some Stoics reported to be Archytas’s definition of time, “time was an interval in the nature of the whole.” Ross clarifies that the “some Stoics” mentioned by Simplicius was Iamblichus.

the whole and (2) all things are in time (218b7). He dismisses this out of hand as naïve, and he moves on to the only theory of his predecessors that seems worthwhile to discuss.

That time is “supposed to be motion or a kind of change” (ἐπεὶ δὲ δοκεῖ μάλιστα κίνησις εἶναι καὶ μεταβολή τις ὁ χρόνος) is taken up next (218b10–11). Aristotle reasons that time is not *kinêsis* because *kinêsis* is *in* the thing that changes and *where* the thing, which moves, is (218b12–13). Time, on the contrary, is “present equally everywhere and with all things” (ὁ δὲ χρόνος ὁμοίως καὶ πανταχοῦ καὶ παρὰ πᾶσιν) (218b13–14).

Aristotle refutes the commonly held beliefs on their own terms, which is to say that he is arguing against the theories based on internal inconsistencies, assuming as his predecessors did, a concept of time as infinite time. For example, were he opposing theories of infinite time based on a theory of time taken, he would not have concluded that there cannot be simultaneous times, nor would there have been any problem with assuming that the movement of the whole would be time just as much as the movement of a part of the whole. So too, there would be no problem understanding time as equally everywhere and with all things, in contrast to motion. Change for Aristotle, recall, occurs only in terms of being; it is specific to the being undergoing the motion. Time, on the other hand, is going to end up being a number or measure—that which is not specific to a given being.

Despite that commentators have taken Aristotle’s arguments in Chap. 10 so seriously as part of his analytic on time, it seems clear—when reading it as parallel to Aristotle’s previous treatments of the other terms of motion—that he is here simply exposing the problems with the *endoxa* and setting himself up to re-understand time as an appropriate topic for physics. If time is to be a subject for physics, and if, as Aristotle has just shown, it is not a natural self-subsistent being itself (it defies the principles of nature previously set out), it will have to be something derived from nature. Indeed, as we have seen, Aristotle considers it a term of *kinêsis*, and he will go on to note here that it will be an attribute of *kinêsis*. In this preliminary investigation, then, he shows us only that time is not a whole composed of actual parts, which calls into question whether or not time is a continuum, but, more fundamentally, as we have seen, that time is a self-subsistent being itself.

2.3 Aristotle’s Positive Account of Time

In Chap. 11, Aristotle moves on to his analytic of time. This is where he will take up the question regarding the nature of time despite that he has given his reader no good reason to think that time actually exists. This is an important point to carry over from Chap. 10. If time does not really exist, then (1) what can we really say about it, and (2) in what sense could it exist?

Aristotle introduces his analytic with what I consider to be a sort of preamble; first, he establishes time, like infinity, place, and void, to be an attribute of motion.

He begins with an argument for the coexistence of time and *kinêsis*. Time does not exist without *kinêsis*, he concludes, because it does not seem to us that time has elapsed when we have not noticed *kinêsis*. He submits the example of those fabled to sleep among the heroes of Sardinia who when awakened did not realize that any time had passed. They conflate the “now” they experience when awakened with the “now” experienced before falling asleep. Since they do not perceive the change that has in fact taken place, they fail to notice the time interval (218b21–27). Aristotle continues with an analogy—just as if the “now” were one and the same, time would not exist, when different nows are not perceived as such, it does not seem that the interval separating them is in time (218b27–29).²² Aristotle then reasons that time is not independent of *kinêsis* (218b31), if it is true that there is no realization that time exists when there is no perception of *kinêsis*.

This is a peculiar claim because, on the one hand, Aristotle seems to be saying that time does exist independently of perception. When the difference between nows is not perceived, time is not perceived, but Aristotle seems clear here that just because time is not perceived does not mean that it does not exist. Yet, he supports his conclusion that time does not exist independently of *kinêsis* because time is not perceived without the perception of *kinêsis*; put another way, time perception entails perception of *kinêsis*. So, on the one hand, he explains time as something that exists independently of perception; and, on the other hand, he justifies this on the basis of what is perceived, i.e., on account of the inextricability of time perception with perception of *kinêsis*. These first arguments in Aristotle's analytic establish the preamble to the rest of his analytic and point to his theory of time as a time interval—a result of an interaction between a being undergoing *kinêsis* and one that is “taking” or apprehending the time of the *kinêsis*.²³ Before continuing, let us take note of the language Aristotle's argument employs here. He tells of time apprehension as a noticing, as a perceiving (218b30–35)²⁴: not using the language of measure and number, as he will later on in the treatise, but the terms, ὀρίσωμεν and αἰσθώμεθα, “we mark” and “we perceive,” respectively. The specific import of this passage for a full understanding of time apprehension will be dealt with in the next chapter, i.e., when I ask *who* or *what* Aristotle intends to be capable of time apprehension. For now, it is enough to notice that Aristotle's transition from

²²ὥσπερ οὖν εἰ μὴ ἦν ἕτερον τὸ νῦν ἀλλὰ ταῦτό καὶ ἓν, οὐκ ἂν ἦν χρόνος, οὕτως καὶ ἐπεὶ λανθάνει ἕτερον ὄν, οὐ δοκεῖ εἶναι τὸ μεταξὺ χρόνος.

²³Hussey (1983, 142) claims that, “Aristotle is arguing here from the phenomenology of time and change,” which he notes to be good dialectical method and apparently “carefully non-committal” about whether time is a “content-noun” or a “mass-term.” If Hussey intends the difference between “content-noun” and “mass-term” to be analogous to Aristotle's differentiation between “time taken” and “infinite time,” respectively, which I suspect he does, I disagree that this ambiguity continues in Chap. 11; rather, it is relegated to Chap. 10.

²⁴εἰ δὴ τὸ μὴ οἶσθαι εἶναι χρόνον τότε συμβαίνει ἡμῖν, ὅταν μὴ ὀρίσωμεν μηδεμίαν μεταβολήν, ἀλλ' ἐν ἐνὶ καὶ ἀδιαίρετῳ φαίνεται ἡ ψυχὴ μένειν, ὅταν δ' αἰσθώμεθα καὶ ὀρίσωμεν, τότε φαινομένη γιγνόμενα χρόνον, φανερόν ὅτι οὐκ ἔστιν ἄνευ κινήσεως καὶ μεταβολῆς.

critiquing the *endoxa* to providing his own position tells of this apprehension as the result of perception and not, perhaps, of intellection.

The analytic begins in earnest at 219a1 when Aristotle claims that, “it is evident, then, that time is neither *kinêsis* nor independent of *kinêsis*” and then announces that this will be his starting point (ἐπεὶ οὖν οὐ κίνησις, ἀνάγκη τῆς κινήσεώς τι εἶναι αὐτόν). His task now, he offers, is to understand what time has to do with *kinêsis* (219a3–4). He begins again to show that we perceive (αἰσθανόμεθα) time and *kinêsis* together. Aristotle famously concludes that there is an inextricable relationship between *kinêsis* and *chrónos* (219a4–9).²⁵ Though, instead of justifying the relationship based on his prior arguments that time is a term of movement, he now supports the idea based on everyday experience with time recognition. Aristotle posits that we perceive movement and time together. His evidence is again based on experience: even in the darkness, when sight is impossible or limited, and when the body does not otherwise sense change (μηδὲν διὰ τοῦ σώματος πάσχωμεν), but movement takes place in the soul (ἐν τῇ ψυχῇ) we say time has elapsed (ἅμα δοκεῖ τις γεγενῆσθαι καὶ χρόνος). Likewise, he tells that when we think time has passed, we assume that *kinêsis* has occurred. We associate the passing of time with change and change with the passing of time. Given his previous separation of *kinêsis* from time, Aristotle immediately denies that time is actually *kinêsis*, thereby concluding that time is an attribute of *kinêsis* (ἀνάγκη τῆς κινήσεώς τι εἶναι αὐτόν). At this point, apprehension of time does not seem to require anything more than perception of *kinêsis*. Motion, in some sense, points us to time.

Aristotle then starts in another vein, establishing the relationship of *kinêsis*, thus time, with magnitude (219a10–14).²⁶ Since what is moved is moved from something to something and all magnitude is continuous, *kinêsis* entails the magnitude. Since *kinêsis* entails the magnitude and the magnitude is continuous, the *kinêsis* is continuous. Since *kinêsis* is continuous, time belongs to *kinêsis* (219a9), and the time that has passed is always thought to be as great as the *kinêsis*; time is, at least in some way, continuous.

Having now established the relationship of time to magnitude, Aristotle continues then to transpose the distinction of “before” and “after,” one he admits to hold primarily of place and in virtue of relative position (219a15–16), to time. He moves from what he thinks must be the correspondence of “before” and “after” in place to that of *kinêsis* (219a17), and from “before” and “after” in *kinêsis* to that of time (219a18). That Aristotle argues from magnitude to time both in the case of continuity and in the case of “before” and “after” demonstrates the primacy of

²⁵ἅμα γὰρ κινήσεως αἰσθανόμεθα καὶ χρόνον· καὶ γὰρ ἐὰν ἡ σκότος καὶ μηδὲν διὰ τοῦ σώματος πάσχωμεν, κίνησις δέ τις ἐν τῇ ψυχῇ ἐνῇ, εὐθὺς ἅμα δοκεῖ τις γεγενῆσθαι καὶ χρόνος. ἀλλὰ μὴν καὶ ὅταν γε χρόνος δοκῇ γεγενῆσθαι τις, ἅμα καὶ κίνησις τις δοκεῖ γεγενῆσθαι. ὥστε ἤτοι κίνησις ἢ τῆς κινήσεώς τί ἐστιν ὁ χρόνος. ἐπεὶ οὖν οὐ κίνησις, ἀνάγκη τῆς κινήσεώς τι εἶναι αὐτόν.

²⁶ἐπεὶ δὲ τὸ κινούμενον κινεῖται ἔκ τινος εἰς τι καὶ πᾶν μέγεθος συνεχές, ἀκολουθεῖ τῷ μεγέθει ἡ κίνησις· διὰ γὰρ τὸ τὸ μέγεθος εἶναι συνεχές καὶ ἡ κίνησις ἐστὶν συνεχής, διὰ δὲ τὴν κίνησιν ὁ χρόνος· ὅση γὰρ ἡ κίνησις, τοσούτος καὶ ὁ χρόνος αἰεὶ δοκεῖ γεγενῆσθαι.

magnitude to time in his account (on primacy of change in place to all other *kinêsis* see also *Meta.* xii 7, 1073a10–13).

The diversion to establish the primacy of magnitude to time benefits Aristotle's account because it establishes that there is a before and after in time, but not in the circular sense in which temporality has to be assumed in order to conclude the existence of time as an attribute of *kinêsis*.²⁷ Instead, before and after are transposed from attributes of magnitude to attributes of time by way of the attributes of *kinêsis* to show that they constitute nothing temporal at all. Instead, they are modal, signaling the constant change of natural being from potentiality to actuality. In locomotion, due to the nature of change of place, this modality happens to be spatial. Time for Aristotle comes later. The *kinêsis* from before to after is noticed because before, “x,” alters. It no longer exists; it becomes, “x₁”—after. It is thus when the *kinêsis* is noticed that time is said to have elapsed. So, while the potential for the continuity of time exists even at the same level as the continua of magnitude and *kinêsis* and, even more fundamental, the being undergoing the change, it does not exist in actuality unless the modal change from before to after is perceived. Thus, time is not the *kinêsis* from before to after.

Once Aristotle accounts for a non-temporal before and after in time, establishing these as modal features of change instead of as parts of time themselves, he turns back to his argument for the relationship between time and *kinêsis* (219a22–29)²⁸:

But we apprehend time only when we have marked motion, marking it by before and after; and it is only when we have perceived before and after in motion that we say time has elapsed. Now we mark them by judging that one thing is different from another, and that some third thing is intermediate to them. When we think of the extremes as different from the middle and the soul pronounces that the ‘nows’ are two, one before and one after, it is then that we say that there is time, and this that we say is time. For what is bounded by the ‘now’ is thought to be time—we may assume this.²⁹

²⁷My reading here has benefitted greatly from Roark's account of the “before” and “after” as non-temporal (Roark 2011, 95–119). Roark argues against the majority view that Aristotle's definition of time is circular because it uses seemingly temporal terms, i.e., “before” and “after” in the definition (Cf. Annas 1975; Owen 1975; Ross 1936 for the alternative view). But, as helpful as Roark's account is, it does not seem necessary to accept Roark's hylomorphic reading of Aristotle's *Treatise on Time* to understand Aristotle to intend an underlying material continuum to provide non-temporal “relata” expressed in the relation “before” and “after.” Roark argues that priority and posteriority are already present in Aristotle's account of *kinêsis* (Roark 2011, 95). I agree, but they are present only insofar as there is a natural being undergoing *kinêsis*.

²⁸ἀλλὰ μὴν καὶ τὸν χρόνον γε γνωρίζομεν, ὅταν ὀρίσωμεν τὴν κίνησιν, τὸ πρότερον καὶ ὕστερον ὀρίζοντες· καὶ τότε φαιμέν γεγονέναι χρόνον, ὅταν τοῦ προτέρου καὶ ὕστερου ἐν τῇ κινήσει αἰσθησιν λάβωμεν. ὀρίζομεν δὲ τῷ ἄλλο καὶ ἄλλο ὑπολαβεῖν αὐτὰ καὶ μεταξὺ τι αὐτῶν ἕτερον· ὅταν γὰρ ἕτερα τὰ ἄκρα τοῦ μέσου νοήσωμεν, καὶ δύο εἴπῃ ἡ ψυχὴ τὰ νῦν, τὸ μὲν πρότερον τὸ δ' ὕστερον, τότε καὶ τοῦτο φαιμέν εἶναι χρόνον· τὸ γὰρ ὀριζόμενον τῷ νῦν χρόνος εἶναι δοκεῖ· καὶ ὑποκείσθω.

²⁹Hardie and Gaye translate ἡ ψυχὴ, “mind” in the ROT. To be more precise, I have amended the translation so that ἡ ψυχὴ is rendered “soul.”

Here again, we see Aristotle allow that the apprehension of time requires *marking* change (τὸν χρόνον γε γνωρίζομεν ὅταν ὁρῶμεν τὴν κίνησιν).³⁰ And again, it is not change per se that is marked, but the “before” and “after.” This before and after refers to the “one thing...different from another”, i.e., of the differing modal features of a being undergoing *kinêsis* in the context of its underlying unity, viz. that it is a self subsistent substantial being *qua* itself. When we apprehend the difference between modal features in terms of a substantial being undergoing various sorts of change (alteration, locomotion, diminution/growth), we ascertain that the *nows* are more than one.³¹

This is to say that time, meaning the time taken, appears to exist because it is apprehended by us as a result of (1) the principle of nature, and (2) the apprehension of that principle. “Now,” which is terminology precipitate of the *endoxa*, takes on a modal reference. “Now,” recall, is not an actual part of time (see also ahead at 220a18–21); it is merely believed to be a part of time. It is a limit. It delimits the *kinêsis* occurring of existing self-subsistent beings (Recall 211b30–212a2 from Aristotle’s discussion of place. He related place first to the *hypokeimenon*, or the intermediate that undergoes change, and then as a limit). The man is untrained (now α), and he is trained (now β). When accidental change is noticed and marked, time is said to have elapsed, at least in some sense.

Aristotle continues, again drawing conclusions about what time *is* with support from the way it is perceived (recall 218b27–29). Time is not thought to have elapsed, he reasons, when the “now” is not perceived to be more than one (219a30–31). But, whereas in the previous argument Aristotle leaves open the possibility that time exists regardless of the perception, and that it is only on account of the perception—or lack thereof—when we misapprehend time, here Aristotle makes the stronger claim that the actual perception and subsequent apprehension of the before and after contributes necessarily to the being of time. “When we do perceive a ‘before’ and an ‘after,’” he writes, “then we say that there is time. For time is just this—number of motion in respect of ‘before’ and ‘after’” (ὅταν δὲ τὸ πρότερον καὶ ὕστερον, τότε λέγομεν χρόνον· τοῦτο γάρ ἐστιν ὁ χρόνος, ἀριθμὸς κινήσεως κατὰ τὸ πρότερον

³⁰Heinemann’s analysis of this passage (2012, 6) is helpful here: “The ‘earlier and later’ in change is that, by being which in passing change is. Yet, what it is to be earlier and later in change is something else, and is not the same thing as change. We become acquainted with time when we mark off the change, that is, when we mark it off by what is earlier and later. We say that time has passed when we get a perception of the earlier and later in change.”

³¹Looking at language used: Aristotle is here referring to thinking or judging for the first time, Aristotle tells that when we judge a difference between *this* (thing here) “now” and *this* (thing here) “now,” we mark time. However, it is the soul (ἡ ψυχή), not specified to be either perceptive or intellectual, which discriminates the *nows*—the before and after—as two. *De motu* 700b18–20 uses different language (κριτικὰ instead of νοήσωμεν) to conclude that perception is capable of exercising judgment: “For imagination and sensation cover the same ground as the mind (since they all exercise judgment) (though they differ in certain aspects as has been defined elsewhere” (*De anima* iii). This early language about perception, marking, and apprehension of time by soul, generally, suggests that time may be apprehended by the sensitive soul as well. Again, we will return to this possibility in the next chapter.

καὶ ὕστερον)³² (219a34–219b1). Not only do we say “there is time,” when we perceive the change from “before” to “after,” but this time that we proclaim when we have apprehended it is indeed all that time is if we are talking about the time taken. Just prior to his famous definition of time, Aristotle concludes: “for time is this” (τοῦτο γὰρ ἐστὶν ὁ χρόνος). His original puzzle to understand the being of time has properly debunked the *endoxa*, and in their wake leaves an entirely new way to think about temporality. Not unlike his treatments of place, infinity, and void, we see his clear intention here to associate time with *kinêsis* and, more primordially, with the beings undergoing *kinêsis*, to render time a potential derivation of *kinêsis* when certain conditions are met.

Predictably, then, Aristotle again concludes that “time is not *kinêsis*,” and here he adds the clarification that it is, “only *kinêsis* in so far as it admits of enumeration” (219b3–5). At this point, then, Aristotle has moved through his justification for the conclusion that time does exist despite that it seems impossible that it could. It exists because Aristotle has redefined it. Now, time is to be understood as a number and not as an imagined vessel containing parts that do not exist. It is to be understood as a number, which demarcates each interval of *kinêsis* for natural beings when this *kinêsis* is apprehended. To say that time exists, then, is to significantly qualify what “exists” means. This is where we have to rely once again on the modal category of beings that exists only in potentiality, which Aristotle established in *Physics* iii.

Aristotle posits a substantial natural being, a subject or a “this,” to help demonstrate what he means by “now.” The particular example of primary substance he posits is a human being (τὸ Κορίσκον) (219b13–33), which is meant to be a metaphor for the “now.” The idea that the now is a being *itself*, and a perfect being at that, is dismissed. The human or “this” is carried from place to place. As the “this” travels, time seems to progress. So is the “this” the same “this” in each place? Or does the “this” change? Aristotle’s solution is two-fold. It reiterates our earlier point about the way that natural self-subsistent beings undergo *kinêsis*. On the one hand, the “this” stays the same because there is something about the “this” that does not substantially changes as it moves along. In order for *kinêsis* to even exist, there must be something that is undergoing the *kinêsis*. Aristotle calls this aspect of something its substratum. In the case of the human being, there is an underlying unity of material and form unmarred as the “this” is carried along. Its identity remains intact not only in its starting location, but also in each location where it arrives thereafter. On the other hand, the “this” changes or moves in accordance with its various potentialities for accidental change (see again 192b13–22). With its travels, we can imagine it ages in accordance with the succession of its locomotion; it is altered in small—even superficial—ways, e.g., it may become pale, thinner, weaker. The “this” both remains the same and yet is ever different. 219a22–29.

³²The “we perceive” given here in English but not found in the Greek is a carryover from the “we perceive” αἰσθανόμεθα just previous in 219a31; the two clauses are parallel in sentence structure.

What Aristotle means here is that the now, like each “this,” is non-temporal; it is something that exists and changes along the continuum of spatial magnitude, itself a modal continuum in the sense that it is ever changing from potentiality to actuality.³³ The body is “here” and now it is “there.” In this case, where there is an explicit display of change in place, the change in the “this” is noticed as a spatial difference; it can be moved in any direction—it is not necessarily moved in the typical forward processing temporal direction “left” to “right.” Despite its direction, its change from “here” to “there” is perceived and marked. Recall 219a22–29, the “this” is a foundation primary to the “now.”

Just as we become aware of “before” and “after” in the act of the subject being carried, yet despite the direction it is moving, we likewise notice the “now” when we observe the “this” undergoing change, whether in terms of place or in terms of qualitative or quantitative change.³⁴ “Before” the alteration is differentiated from “after” the alteration because a change is perceived. The house was not built, and now it is built; I was on my way to Thessaloniki, and now I have arrived. We typically think of these examples of *kinêsis* as temporally determined. We understand time to be a vessel in which all change occurs according to a predetermined progression, and we think of the “now” as points on the line of this progress. But, this view is precisely what Aristotle has countered. The “now,” as it is with the human subject Aristotle posits, is both that which remains, i.e., the identity or substratum that is maintained through *kinêsis*, as well as the difference before and after the *kinêsis* (219b26–29). The “now” is every subsistent being, both its substratum and its difference between what it is before and then after *kinêsis*.

Recall, that Aristotle is after comprehensive understanding of nature, and here he writes, “this is what is most knowable; for motion is known because of that which is moved, locomotion because of that which is carried. “For what is carried is a ‘this’ (τὸδε τι), the movement is not” (219b29–31). *Physics* i–ii provided us the *archai* of nature and the nature of natural beings. *Physics* iii–iv investigated motion and its terms. Here, we see confirmation from Aristotle that we have indeed been

³³Coope (2005, 29) supports that the now is not temporal when she observes, “On the one hand, none of time *is* except the now. This suggests that time only exists in virtue of the existence of the now. But on the other hand, for the now to exist, it must be a division or boundary of some independently existing continuum. This continuum cannot be *time*, since time itself is dependent on the now. It follows that there must be some *other* continuum, prior to time, on which the now depends for its existence” (emphases in original). For Coope, however, the “other continuum” is going to be change. I will ultimately disagree with this conclusion. The more primordial “other continuum” is a “this,” the self-subsistent existing natural beings undergoing the change as a result of their very nature. King (2009, 63) states both that “the change is marked by our saying *now* and *now*; that is how we mark off the before and after in time”; and, “saying now has to be thought of as occupying no time, like an instant...[the now] is the temporal analogue of a point...” While it is not correct to say that the before and after is marked *in* time—by time is more appropriate—because as King acknowledges just after, the now does not occupy time, it does seem right that the change is marked by apprehension of more than one “now,” which must be non-temporal.

³⁴See Hussey (1983, 143) on “changes ‘along’ magnitudes”; there, he concludes that every change is necessarily a change along a path and thus that there is ontological and logical priority on the path.

proceeding from what is most knowable to us to what is most knowable to nature. We perceive motion, which alerts us to investigate nature. When we investigate the nature of natural beings, we find that their nature is the principle of *kinêsis* and stasis.

Kinêsis exposes the complexity of natural beings, humans included; no natural being, by its nature, is simply static. We proceed from the *kinêsis* we perceive, and we discover that the terms of motion are all—at least to begin with—potentialities and not actualities of being. e.g., contra Zeno, infinity exists only by potential division. The *kinêsis* itself is not the topic of investigation; the “this,” or substantial beings are. The “now” we notice as “before” in this way and “after” in that way is precisely Aristotle’s topic in the *Physics*, as demonstrated in the last chapter. The kind of being, which remains the same, and yet constantly changes, is peculiar to natural being. This is to say that “the now” is a common name for natural being, and thus a referent for its various stages of potentiality and actuality.

Aristotle has thus done the work to extricate the temporal character of “now” (*nun*) from the term. To perceive a change from “now” to “now” connotes no change “in time.” Instead, it means simply the actual difference on the path (to use Hussey’s term) of *kinêsis* from “before” (Jackson is untrained.) to “after” (Jackson is trained.). Aristotle’s moving body metaphor is perfect here—the body was “here” and now it is “there.” The temporal component of such *kinêsis* comes as a derivative of the *kinêsis* when the change is apprehended. It is this apprehension, perception and marking, which creates time by way of bringing it from potentiality (possible as a derivative of the change naturally occurring in this world) to actuality (actually derived of the change naturally occurring in the world by another part of nature).

With this said, then, we are in a position to correctly interpret Aristotle’s subsequent claim that “if there were no time, there would be no ‘now’, and vice versa” (φανερὸν δὲ καὶ ὅτι εἴτε χρόνος μὴ εἴη, τὸ νῦν οὐκ ἂν εἴη, εἴτε τὸ νῦν μὴ εἴη, χρόνος οὐκ ἂν εἴη) (220a1). It would be too easy to read this passage to suggest that Aristotle has now contradicted himself, or that my argument is severely flawed, understanding him here to be reverting to a traditional understanding of time as a whole composed of three parts: past, present, and future. And, this would seem to make sense. How could we have time without having “now”? But, what Aristotle seems to mean here is that to speak of “now” as a common name for an existing self-subsistent natural being undergoing *kinêsis* is already to be implying perception of the being. Just like the number that Aristotle claims to be time, the “now” refers to or names the natural being existing independently of all perception and conceptualization. The “now” does not exist without time and vice versa because both the “now” and time require someone noticing and naming, i.e., apprehending, *kinêsis* in natural objects. Put another way, “now,” signifies a relation between the one perceiving motion and the motion itself; it is a referent to mark perceived change from “before” to “after.” Re-invoking the body metaphor, Aristotle concludes that, “the number of the locomotion is time, while the ‘now’ is comparable to (ὥς τὸ) the moving body, and is like the unit of number” (χρόνος μὲν γὰρ ὁ τῆς φορᾶς ἀριθμός, τὸ νῦν δὲ ὥς τὸ φερόμενον, οἷον μονὰς ἀριθμοῦ) (220a4). The

number is the name of the change, and the now is the name of the “this”—the existing self-subsistent natural being—observed. That both the thing changing and the change itself are named implies someone or something doing the naming.

The “now” and time have a complex relationship because not only does time seem to be made continuous by the now, i.e., time intervals continue so long as a natural object is in motion, but also time is limited by the “now,” i.e., when change has occurred, the interval numbering the change likewise ends (220a5). To say here that the “now” is both that which makes time continuous as well as that which limits time is really to equivocate on the term. Or, to be charitable to Aristotle here, it is seemingly to conflate the two senses of “now” just established—(1) the substratum of the natural object and (2) the object “before” and then “after” *kinêsis*. It is by the first sense of “now” that time is made continuous because the natural object continues to move with periods of rest so long as it exists. It is by the second sense that time is limited.

Aristotle returns to the earlier comparison of the “now” with a point (recall 218a12–29), officially dismissing it here (220a9–14). Whereas a point can be the end of one thing and the beginning of another, essentially making one into two, so long as there is a pause, the “now” taken in the first sense above is the analogue or name of the body constantly moving. It continuously undergoes many individual instances of *kinêsis*. Thus, it is in this sense always different. It is constantly undergoing *kinêsis* just as the body is always being carried along.

Aristotle concludes Chap. 11 asserting that the “now” is indeed not time. It is an attribute of time (ἡ μὲν οὖν πέρας τὸ νῦν, οὐ χρόνος, ἀλλὰ συμβέβηκεν). To clarify, though, Aristotle does not intend attribute (συμβέβηκεν, literally “comes together”) here in the sense that time is “an attribute” of *kinêsis*, i.e., derivative of it. The sense in which the “now” is an attribute of time is “in so far as it numbers, it is number... but number (e.g., ten) is the number of these horses, and belongs also elsewhere” (220a18–21).³⁵ This is the first time Aristotle will introduce the Greek idea that number is nothing symbolic, but rather that which is named by the number (see also 220b6–9), i.e., “the number of these horses”. Because “now” names the natural object or “this,” and the “this” is constantly undergoing *kinêsis*, the number of its *kinêsis* from “here” to “there,” from “before” to “after,” ends up referring to the same thing, though in a different sense, that the “now” names. Number names the things counted, i.e., the “nows,” and the now names, at least in one sense, the natural being at different points of *kinêsis*, i.e., at different points of being.

Following the discussion of the relationship between time and “now,” Aristotle concludes *Physics* iv 11 confidently, saying: “It is clear, then, that time is number of *kinêsis* in respect of the before and after, and is continuous since it is an attribute of what is continuous” (ὅτι μὲν τοίνυν ὁ χρόνος ἀριθμός ἐστιν κινήσεως κατὰ τὸ

³⁵ ἡ δ’ ἀριθμεῖ, ἀριθμός τ’ τὰ μὲν γὰρ πέρατα ἐκείνου μόνον ἐστὶν οὗ ἐστιν πέρατα, ὁ δ’ ἀριθμός ὁ τῶνδε τῶν ἵππων, ἢ δεκάς, καὶ ἄλλοι.

πρότερον καὶ ὕστερον, καὶ συνεχῆς (συνεχοῦς γάρ), φανερόν) (220a25–26).³⁶ Aristotle thus ends the chapter as if he were providing a conclusion immediately following his discussion of the magnitude-*kinêsis*-time relationship at 219a14. Strangely, this abrupt back-step to what he had discussed prior to his arguments for the relationship between the “now” and time make the latter seem as though they were tangential. Perhaps Aristotle wanted to reconcile his definition of time with previous conceptions of the now; if his entire analytic of time would contend with the *endoxa*, he had to explain too a new way to think about “now,” i.e., as non-temporal. If “now” is non-temporal, then so too are “before” and “after,” and thus there is no circularity in his definition of time, as the number of before and after with regard to *kinêsis*. And, in this last assertion, he brings everything together when he returns to the idea that temporality is an attribute of that which is already continuous, i.e., *kinêsis*, and by way of his discussion of the now, it seems clear that *kinêsis* is in turn consequent of that which is more primordial to change, i.e., the natural being that undergoes the *kinêsis*.

If Aristotle has then addressed the first puzzle in his analytic of time and has established that time *does* exist, but in a new sense, i.e., as a potential continuum derived from the *kinêsis* beings are undergoing, it is still left to him to be more explicit about its nature. If time needs to be apprehended in order that it exist as actualized, i.e., as a number identifying the *kinêsis* of a being from before to after, who or what exactly is doing the apprehending? Whence does the number come? We will take up these questions in the next chapter.

³⁶Hardie and Gaye (ROT) render “συνεχῆς (συνεχοῦς γάρ), φανερόν” as “attribute of what is continuous,” but the idea of “attribute” does not appear in the Greek. It would be more accurate to translate the Greek: manifestly continuous; for the continuous.

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