

The Rhythm of Time

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Does time *exist*? How could we doubt such a thing? Surely nothing is more tangible than *time*. Is not time both the most intimate aspect of life and its strictest ruler, an all-pervasive reality from which we carve our existence, against whose predations we strive to preserve our youth and vitality, and yet to whose ultimate authority each of us seems destined to succumb? Indeed, for the most part, time appears to us in the guise of this all-encompassing *domain* in which our existence is played out, an absolute measure that will always out-live us. In relation to Time, our own fleeting existence is merely an incident, an evanescent moment in the great cosmic flow.

And yet: when we turn to examine time as such, there is nothing to *see*. What we are beholding when we believe ourselves to be examining time are precisely the *objects* and *phenomena* by means of which we measure time. For instance, we talk about “managing time” or “saving time”, but what we mean is that we are counting hours on a timepiece—a wristwatch, a cell-phone, a computer, or a public clock. We talk about “observing the passage of time”, but what we really mean is that we are noting changes that occur in the bodies and material around us. Winter has once again given way to spring and then summer. We have got a few more grey hairs. This or that friend or family member is no longer with us. We apprehend all these developments, all these changes in the material bodies around us, by grouping them into a single general formula: *time goes by*.

When reaching towards this evasive force and reality, we are naturally drawn to metaphors relating to movement or things that move. We say that time *passes*, but also that it *flows* or *races*. Time is a *meanderer*, but also a *stream*; sometimes an ocean, but also a *river*. For Walter Benjamin, in his famous analogy in “Theses on the Concept of History”, time is also a *wind* blowing humanity from Paradise: humanity is hurled onwards with its back to the future. But in order for time to appear, it would seem that more than just continued movement is required. It takes some kind of break, an incision or a *pulse*. Or simply this: a *rhythm*. It is this notion that I want to reflect on here, that is, to see if and to what extent it can be meaningful to conceive of time itself as, in the final instance, having its origins in the phenomenon of *rhythm*.

A reflection of this sort permits me to take my point of departure in classical antiquity’s greatest philosopher of time. I am referring here, not to the

Church Father St. Augustine and his oft-quoted meditations upon the inscrutability of time in Book Eleven of his *Confessions*, but to a philosopher and a text which preceded Augustine by more than half a millennium, namely Aristotle and his monumental *Physics*, the lectures on Nature that were compiled by his students and followers. These lectures are, above all, a long and winding investigation into and reflection upon *movement* and *change*—in Greek, *kinesis* and *metabole*. Greek metaphysical speculation saw this as its supreme task: to develop and formulate concepts capable of enabling thought to identify the latent pattern behind or in nature’s mutability. Everywhere movement and change are taking place. The challenge for thought, then, is to identify the forms—linguistic, logical, mathematical—that allow us to conceive of and apprehend patterns in things that are obscure and dimensions in things that are in movement.

We live today in a culture so saturated by the results of this ambition that it can be hard for us to fully grasp and appreciate the extent of the Greeks’ ambition and the intellectual work required to fulfill it. We have access to mathematical models which, with astonishing precision, can calculate and thereby also predict the course of events that have not yet occurred, such as the movement of heavenly bodies, changes in the weather, and the decay of atoms. And yet Aristotle was looking in the first instance, not for algorithms, but a *language* that might be able conceptually to grasp and explain change itself, and thus to say *what it is*. Zeno’s celebrated paradox had exploited language’s difficulty in conceptualizing the inner dynamic of movement in order to announce that what we see as movement is actually impossible, and thus that time itself is impossible or non-existent.

It is in his efforts to construct a conceptual framework for describing the movement that Aristotle develops such concepts as “possibility” and “reality”, *dynamis* and *energeia*, which to this day we continue to use as a self-evident conceptual framework in both everyday and scientific discourse. It is, moreover, in this connection that he also broaches the question of *time*, itself an underlying thematic of his *Physics* as a whole. This holds primarily for the book’s fourth chapter, which contains the first known attempt in the philosophical literature to define time philosophically, that is, to say *what time is*.

There is a special atmosphere around the thinkers of early classical antiquity that makes a return to their texts both liberating and imperative. They pose their questions in a kind of dawn of the world, when so little was as yet fixed and specified, when theoretical-scientific language itself had yet to find its definitive expression. At this moment thought still moved in and out of everyday language as it sought to connect and delineate what it had seen.

Here, in Book Four of *Physics*, Aristotle begins by asking the same question that I also began with, namely, does time *exist*? Is it something? In fact, he continues, there is strong evidence to the contrary. If time is the past, then it no longer *is*. If it is still to come, then it does not exist either. And, lastly, if it is the present, then it would seem to quickly collapse into next to nothing, only a narrow threshold between two non-existent entities.

Aristotle cites those who argue that time is quite simply the movement of everything. But he quickly remarks that time cannot be identical with movement pure and simple. Time is what we use to *measure* and *compare* other movements. By means of time we can determine how fast something is moving, when it takes place, and how different movements stand in relation to each other.

All the same, he continues, we cannot imagine time *without* movement. If there were no movement, time could not exist. In any event, *we* would have no means of determining whether this was the case. In a wholly immobile cosmos there is no way to know whether a second or a millennium has passed. It is only in relation to something moving that such a distinction has meaning.

Aristotle's question is thus: if it is the case that time and movement are so intimately connected while nonetheless not being identical, what is it in movement that characterizes time specifically?

After several long and complicated attempts to reach an answer, he finally arrives at his famous definition, on page 219b: "time is the measure of motion". In Greek, the definition reads: *chronos arithmos kineseos*. Time is the *arithmos* of movement, what could also be translated as *number* or *quantity*. We recognize the word *arithmos* from "arithmetic", knowledge of numbers.

Time is thus to be understood as the number or measure of movement, its *arithmos*: But how are we to understand this? Does Aristotle mean by this that time itself is not a part of movement, that it ought rather to be understood as an abstract, latent form which exists somewhere beyond movement itself? No, he is quite clear about time and movement being fundamentally indivisible. We may measure movement in terms of time, but we also measure time by movement.

How much time has passed? No answer to this question is possible that does not involve reference to a movement, perhaps the gnomon's movement across the sundial, the sun's movement across the heavens, the earth's movement upon its axis, or the oscillation of a caesium atom, humanity's currently most advanced precision chronometer. Time seems always to demand reference to a movement, or, as Aristotle writes: "they determine one another mutually".

Time is in motion but without being the movement itself. Time is the *number* of movement, its quantity or measure, as it reveals itself to the measuring soul of humanity. Because, just as time presupposes movement, so, too, does time seem to presuppose the existence of a soul as that point from which it becomes measurable. As Aristotle writes: “If there is nothing other than the soul and its reason that can count, then there can be no time if the soul does not exist”. This passing observation is significant because it appears to gesture towards Augustine’s famous conclusion, formulated much later, that time is the extension created by the human soul, our inner being, as the only place where past and future join to form the arc that constitutes time itself.

Unlike Augustine and modern idealist philosophers such as Kant and Husserl, who locate time in “the form of inner sense” as the ultimate precondition of all experience, Aristotle never considers deriving one from the other. He notes that what we refer to as time is somehow connected to the soul and to reason, *psyche* and *nous*, and to their ability to measure. But despite its measurement by human beings—a precondition for something to be assigned quantity and number—the measure of time does not *exist* within human beings. Aristotle instead turns his gaze outwards once again, declaring that the ultimate measurement is constituted by that which is most distant and stable, namely the uniformly circular orbits of the heavenly bodies. The periodically recurrent movement of the heavens is the ultimate measure of them all: the cosmos’s own latent number. Or should we say: the cosmos’s own *rhythm*?

For is it not ultimately *rhythm*, the regularly recurring pulse, that encapsulates the deepest qualities of time in this Aristotelian treatise? Is it not this *rhythm*, at work everywhere in the cosmos, that makes movement and change possible to comprehend and thereby allows the human soul to construe the chaotic flow of movement and change specifically as a *time* within what it imagines as *time itself*?

The word *rhythm*, like *arithmetic*, comes from the Greek. There is an obvious assonance between *rythmos* and *arithmos*. It is as if they are in some way derived from each other. They share not only the same phonetic material but also the same domain. In its earliest documented occurrences, the word *rythmos* refers precisely to a combination of movement and form as a designation for order in flux.

At the same time, it may be noted that the opposite of *rythmos* is *arhythmos*—with a *y*—as a designation for that which lacks order: something chaotic. It sounds almost identical to *arithmos*, as if the mathematical were

somehow the opposite of rhythm, something a-rhythmic. But *arythmos* with a y and *arithmos* with an i are not the same thing. According to French philologist Pierre Chantraine, the letter *alpha* in *arithmos*/number should not be understood as a negation. Rather, it functions as what he calls a “prosthe-sis”, an intensifying supplement or support. It thus has nothing to do with what is un- or non-rhythmic.

Both words share the graphically and phonically identical syllable *thmos*, which, again according to Chantraine, is bound up with the notion of something “juste exacte”, that is to say something *precise*; in other words, a movement that has come to an end and been completed. Through the bridge of this simultaneously rejected and arrested syllable—*thmos*—a connection is thus established between *rythmos* and *arithmos*, between *rhythm* and *number*.

Aristotle, as already noted, defines time in terms of *arithmos*. Yet he does not mention the word *rythmos*, rhythm, at any point in his *Physics*. If we want to know what he thinks of *rhythm*, we must instead turn to his *Poetics*. In his analysis there of different aesthetic forms, he specifically highlights *rythmos*, together with harmony, as a central aspect of good poetic composition.

However, it is ultimately not in *Poetics* that we find what, in this context, is the most interesting allusion to *the rhythmic* in Aristotle’s thought. This is to be found rather in his *Rhetoric*. In Book 3, Chapter 8 of *Rhetoric*, he writes: “The form of diction should be neither metrical nor without rhythm. If it is metrical, it lacks persuasiveness [...] If it is without rhythm, it is unlimited, whereas it ought to be limited [...] Now all things are limited by number, and the number belonging to the form of diction is rhythm”.

Here, in the rhetorical analysis of the art of speaking persuasively and evenhandedly, we find confirmation of the connection we have been seeking. Here Aristotle ties together numerical amount and rhythm, as *the way in which a flow is given form and thereby made comprehensible*. This investigation of the most effective expression in human language also serves to create a bridge to time as the inner rhythm of change itself. Amidst this flowing and streaming, that which is rhythmic establishes sequence in movement, one upon which human beings can rest even as they are drawn into its mutability and destruction.

Rhythm gives movement form. In so doing, it establishes *time* as a space of repose to inhabit, like a pulsating abode, indeed, as that pulse’s own abode, from which the changeable whole becomes comprehensible as a whole similarly at rest.

In this transposition of the rhythmic, from the poetic-rhetorical sphere to that of time and the domain of physical existence, it becomes possible to

discern something that we were previously unable to see fully, namely, how our understanding and definition of time as “quantity of movement” is also deeply anchored in a particular experience of *pulse* and *rhythm*. We can now return to Aristotle’s line of reasoning in *Physics* in which he expressly connects time to the motion of heavenly bodies, this time seeing—or perhaps even hearing—it in a new mode. In it, he observes how “circular movement is to the highest degree a measurement since its number is the most comprehensible of all”. In fact, it defines what he calls “uniform motion”. This is also why time, he adds, is often imagined as the movement of heavenly spheres, that which is the measure of all other movements and which is hence the measure of time itself. Time is thus ultimately conceived of as a circle or cycle.

To this we can now add: time is imagined as pulse and *rhythm*, as something that recurs in the same way again and again. It thus reveals itself as the cosmos’s own rhythm, circling back to its point of origin only to begin again. Mathematics and arithmetic allow us to construct infinite chains of symbols, following endlessly upon each other, since for every n there exists not only an $n-1$ but also an $n+1$, something that makes infinity comprehensible as an everlasting and incomplete sequence. We can place such an imagined axis or line of symbols beside what is pulsating so as to allow the pulse itself to extend itself along its determined path in the sequence $n+1+1+1\dots$ and so on, and thereby create an *axis of time*. But for time to make its appearance as something measurable and countable in itself, it must first have presented itself as circle, pulse, and rhythm.

It is as such a perceived rhythm of reality itself that *time* first makes its appearance. It is as a rhythm of this kind, too, that it continues to produce its effect and ensure its validity as the resting and pulsating form of all matter. It holds our world together with the help of the ever more highly calibrated instruments with which it is measured, and which themselves in the final instance rely on the ungrounded ground of the rhythmic itself.

Indeed, time is the rhythm of motion.