# Aristotle on Time

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Aristotle's process of constituting the notion of time through Phy.,[1] Δ, 10 to Phy., Δ, 12 has the following steps:

### *1) Time and not-being*

Since one part of time 'has been and is not, while the other is going to be and is not yet … one would naturally suppose that what is made up of things which do not exist could have no share in reality.' (Phy., Δ, 10)

### *2) Time, divisibility and now*

We should not regard time as something divisible to parts, some of which belong to past and some other to future. Aristotle argues that 'if a divisible thing is to exist, it is necessary that, when it exists, all or some of its parts must exist. But of time some parts have been, while others have to be, and no part of it is though it is divisible.' The last phrase, namely 'no part of it is' is based on the fact that 'what is 'now' is not a part.' The reason being that 'a part is a measure of the whole, which must be made up of parts. Time, on the other hand, is not held to be made up of 'nows.'' (Phy., Δ, 10)

[1] Abbreviations used in this paper:
Phy. *Physics*

### *3) Time is not motion*

Aristotle rejects a general belief based on which time is ‘motion and a kind of change’ because while ‘the change or movement of each thing is only in the thing which changes or where the thing itself which moves or changes may chance to be,’ ‘time is present equally everywhere.’ (Phy., Δ, 10)

### *4) Time cannot exist without change*

Although time is not motion or change, it cannot exist without change. One evidence of this, Aristotle says, is the state of our own minds: when it ‘does not change at all or we have not noticed its changing, we do not realize that time has elapsed. Therefore, ‘time is neither movement nor independent of movement.’ (Phy., Δ, 11)

### *5) Time and before-after*

Aristotle argues that since ‘before’ and ‘after’ hold primarily in place and in magnitude, they must hold in movement as well due to their correspondence. In fact, ‘the ‘before’ and ‘after’ is identical in substratum with motion, yet differ from it in definition, and is not identical with motion.’ Thereupon, since time and movement correspond wit heach other, they must also hold in time. In fact, there is some kind of unity between motion and before-after: ‘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 that time has elapsed. Now we mark them by judging that A and B are different, and that some third thing is intermediate to them. When we think of the extremes as different from the middle and the mind 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.’ (Phy., Δ, 11)

### *6) Time: number of motion in respect of before and after*

‘When we perceive the ‘now’ one, and neither as before and after in a motion nor as an identity but in relation to a ‘before’ and an ‘after.’ No item is thought to have elapsed, because there has been no motion either. On the other hand, when we perceive a ‘before’ and an ‘after,’ then we say that there is time. For time is just this- number of motion in respect of ‘before’ and ‘after.’

### *7) Time, enumeration and number*

The consequence of the relation of time and number of motion in respect of before and after is that time is ‘movement in so far as it admits of enumeration.’ A proof of this, Aristotle says, is that ‘we discriminate the more or less by number, but more or less movement by time.’ Therefore, we can say ‘time is a kind of number.’ (Phy., Δ, 11) In this analogy, Aristotle corresponds ‘now’ to the unit of number.

‘If there were no time, there would be no now, and vice versa. Just as the moving body and its locomotion involve each other mutually, so too do the number of the moving body and the number of its locomotion. For the number of the locomotion is time, while the ‘now’ corresponds to the moving body, and is like the unit of the number.’ (Phy., Δ, 11) And this now is not the same during the movement but always different because body carried is different. (Phy., Δ, 11)

Aristotle clarifies the sense of number he assigns to time: ‘Time is not number in the sense in which there is ‘number’ of the same point because it is beginning and end, but rather as the extremities of a line from a number, and not as the parts of the line do so… and further because obviously the ‘now’ is no part of time nor the section any part of the movement, any more than the points are parts of the time- for it is two lines that are parts of one line.’ (Phy., Δ, 11)

Aristotle distinguishes two senses of now: i) now in the sense of a boundary and ii) now in the sense of number. It is only the second sense of 'now' that is time because it is only the second sense that belongs to other things. The first sense belongs only to that which it bounds. (Phy., Δ, 11)

### *8) Time and measure*

'Not only do we measure the movement by the time, but also the time by the movement because they define each other. The time marks the movement, since it is the number, and the movement the time. We describe the time as much or little, measuring it by the movement, just as we know the number by what is numbered, e.g. the number of the horses by one horse as the unit. (Phy., Δ, 11) Therefore, 'time is a measure of motion and of being moved, and it measures the motion by determining a motion which will measure exactly the whole motion, as the cubit does the length by determining an amount which will measure out the whole. (Phy., Δ, 12)