

Aristotle's Theory of Motion

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1) *Definition*

Aristotle defines motion as such: 'The fulfillment of what exists potentially, in so far as it exist potentially, is motion.' (Phy.,¹ Γ, 1, 201a10-11) He defines it again in the same chapter: 'It is the fulfillment of what is potential when it is already fully real and operates not as itself but as movable, that is motion. What I mean by 'as' is this: Bronze is potentially a statue. But it is not the fulfillment of bronze as bronze which is motion.' (Phy., Γ, 1)

2) *Motion: not a real thing*

Aristotle believes that 'there is no such thing as motion over and above the things' that is supposed to mean that motion cannot be something else than his categories: 'It is always with respect to substance or to quality or to quantity or to place that what changes changes. But it is impossible to find anything common to these which is neither 'this' not quantum nor quale nor any of the other predicates. Hence neither will motion and change have reference to something over and above the things mentioned, for there is nothing over and above them.' (Phy., Γ, 1, 200b32-201a3)

In fact, it is what is moved that is a reality for Aristotle and not the motion itself: 'Motion is known because of that which is moved, locomotion because of that which is carried. What is carried is a real thing, the movement is not.' (Phy., Δ, 11)

¹ Abbreviations used in this paper:

Phy.

Physics

3) *Three items in each motion*

Aristotle distinguishes three items in each motion (Phy., E, 4):

- a) 'That which' moves; (Note: It is this item that makes a motion a unitary motion. (Phy., Δ, 11)) e.g. a man or gold
- b) 'That in which' the movement occurs; e.g. a place or an affection
- c) 'That during which' the movement takes place; e.g. time

Based on the second item, Aristotle distinguishes three kinds of motion: quantitative, qualitative and local which are in respect of the three categories of quantity, quality and place. (Phy., E, 1) However, Aristotle speaks of four things in respect of which change takes place adding substance to the three mentioned categories. (Phy., Γ, 1, 200b32-35) It seems it is based on the differentiation of that in which motion takes place in these four types that Aristotle distinguishes four kinds of motion. (Phy., Γ, 1, 201a11-15):

- a) Alteration: the motion of what is alterable qua alterable
- b) Increase and decrease: the motion of what can be increased and what can be decreased
- c) Coming to be and passing away: the motion of what come to be and pass away
- d) Locomotion: the motion of what can be carried away

Alteration happens in qualities, increase and decrease in quantities, coming to be and passing away in substances and locomotion in place.

4) *Problem of motion as an element*

Discussing why Pythagoreans put motion in their column of indefinites, Aristotle somehow hints to the problem of understanding motion due to its non-elemental character: 'The reason why they put motion into these genera is that it is thought to be something indefinite and the principles in the second column are indefinite because they are privative: none of them is either 'this' or 'such' or comes under any of the other modes of predication. The

reason in turn why motion is thought to be indefinite is that it cannot be classed simply as a potentiality or as an actuality- a thing that is merely capable of having a certain size is not undergoing change, nor yet a thing that is actually of a certain size, and motion is thought to be a sort of actuality, but incomplete. The reason for this view being that the potential whose actuality it is is incomplete. This is why it is hard to grasp what motion is. It is necessary to class it with privation or with potentiality or with sheer actuality, yet none of these seems possible. There remains then the suggested mode of definition, namely that it is a sort of actuality, or actuality of the kind described, hard to grasp, but not incapable of existing.’ (Phy., Γ, 2, 201b24-) It becomes a real difficulty when it is asked whether the motion is in the mover or in the movable: ‘The solution of the difficulty that is raised about the motion-whether it is in the movable- is plain. It is the fulfillment of this potentiality, and by the action of that which has the power of causing motion; and the actuality of that which has the power of causing motion is not other than the actuality of the movable, for it must be the fulfillment of both. A thing is capable of causing motion because it can do this, it is a mover because it actually does it. But it is on the movable that it is capable of acting. Hence there is a single actuality of both alike, just as one to two and two to one are the same interval, and the steep ascent and the steep descent are one- for these are one and the same, although they can be described in different ways. So it is with the mover and the moved.’ (Phy., Γ, 3)

This is not, however, the solution:

‘This view has a dialectical difficulty. Perhaps it is necessary that the actuality of the agent and that of the patient should not be the same. The one is ‘agency’ and the other ‘patiency’; and the outcome and the completion of the one is an ‘action’, that of the other a ‘passion.’ Since then they are both motions, we may ask: in what are they, if they are different? Either (a) both are in what is acted on and moved, or (b) the agency is in the agent and the patiency in the patient. ...

Now in alternative (b), the motion will be in the mover, for the same statement will hold of ‘mover’ and ‘moved.’ Hence either every mover will be moved, or, through having motion, it will not be moved.

If on the other hand (a) both are in what is moved and acted on- both the agency and the patiency (e.g. both teaching and learning, though they are two, in the learner), then, first, the actuality of each will not be present in each, and, a second absurdity, a thing will have two motions at the same time. How will there be two alterations of quality in one subject towards one definite quality? The thing is impossible: the actualization will be one.’ (Phy., Γ, 3)

This leads Aristotle to another problem, the problem of one identical actualization for two different things:

‘But (someone will say) it is contrary to reason to suppose that there should be one identical actualization of two things which are different in kind. Yet there will be, if teaching and learning are the same, and agency and patiency. To teach will be the same as to learn, and to act the same as to be acted on- the teacher will necessarily be learning everything that he teaches, and the agent will be acted on. One may reply:

- (1) It is not absurd that the actualization of one thing should be in another. Teaching is the activity of a person who can teach, yet the operation is performed on some patient- it is not cut adrift from a subject, but is of A on B.
- (2) There is nothing to prevent two things having one and the same actualization, provided the actualizations are not described in the same way, but are related as what can act on what is acting.
- (3) Nor is it necessary that the teacher should learn, even if to act and to be acted on are one and the same, provided they are not the same in definition (as ‘raiment’ and ‘dress’), but are the same merely in the sense in which the road from Athens to Thebes are the same, as has been explained above.’ (Phy., Γ, 3)

And he continues:

‘For it is not things which are in a way the same that have all their attributes the same, but only such as have the same definition. But indeed it by no means follows from the fact that teaching is the same as learning, that to learn is the same as to teach, any more than it follows from the fact there is one distance between two things which are at a distance from each other, that the two vectors AB and BA, are one and the same. To generalize, teaching is not the same as learning, or agency and patiency, in the full sense, though they belong to the same subject, the motion; for the ‘actualization’ of X in Y’ and the ‘actualization of Y through the actualization of X’ differ in definition.’ (Phy., Γ, 3)

5) *Change versus motion*

Aristotle differentiates change from motion saying while motion has a particular first and end, change does not: ‘Change differs from motion (motion being change from a particular subject to a particular subject).’ (Phy., E, 5, 229a30-32) On the contrary, we have change when we say ‘becoming white’ in which ‘no starting point is specified.’ (Phy., E, 5, 229b10-12)