

Aristotle's Definition of *Kinêsis*: *Physics* III.1

Background

In *Physics* I.7, Aristotle told us that change (coming to be) involved a subject (that persists through the change and a pair of contraries (the two *termini* of change). One might think that this provides him with a definition of change, since it seems to provide necessary and sufficient conditions. In the case of local change (movement), it would look like this:

x moves iff x is at p_1 at t_1 and x is at p_2 at t_2 (where $p_1 \neq p_2$, $t_1 \neq t_2$).

This would yield the so-called “at-at” theory of motion: to move is to be **at** one place at one time and **at** another place at another time. On this theory, moving is just a matter of being at different places at different times (and change in general is just a matter of being in different and incompatible states at different times).

But although Aristotle thinks that this does indeed give us necessary and sufficient conditions for change, he does not think that it tells us what change **is**. This is obvious from the fact that in *Physics* III.1 he offers a definition of change (*kinêsis*) that looks very different from this. Why is this?

Aristotle does not say. But presumably, the problem with the “at-at” theory is that it leaves out the crucial thing about change—namely, that it is a **process** or **passage** from one state to another, or from one place to another. That is, he thinks of change as a **continuous** not a **discrete** phenomenon.

What does this amount to? Consider what the “at-at” theory tells us about an object, x , that moves from p_1 to p_2 , beginning its journey at t_1 and ending at t_2 . It tells us where the object is at the beginning of the change, and where it is at the end—but it says nothing about its location during the interval between t_1 and t_2 . For all the “at-at” theory says, the object may well not be located anywhere at all during that temporal interval—it may even have gone out of existence. So long as it's at p_1 at t_1 and at p_2 at t_2 , x has undergone a change of location—it has moved.

But we require more than this of motion. To move from p_1 to p_2 , x must occupy, successively, the intervening places on some continuous line that connects p_1 to p_2 . That is, more is required than first being in one place and later being in another—the moving thing must **get from** one place to another.

What this means is that our ontological commitments are greater than the “at-at” theory requires. We have more than just a subject of change and a pair of contraries; we also have a new entity, a *kinêsis*, a process, which is some kind of a being. And

Aristotle's question is, what kind of being is this? What is the nature of a *kinêsis*?

Aristotle's definition (201^a10-11):

“Change (motion) is the actuality of that which potentially is, *qua* such.” (*hê tou dunamei ontos entelecheia hê; toiouton*)

Fine and Irwin have: “... the actuality of what is F potentially, insofar as it is F potentially, is motion.” This gives the right interpretation, but goes beyond a literal translation.

This definition has attracted a lot of criticism over the years for its obscurity. One of the most trenchant was Gassendi's (*Exercises against the Aristotelians* [1624], II.2.4):

“Great God! Is there any stomach strong enough to digest that? The explanation of a familiar thing was requested, but this is so complicated that nothing is clear anymore The need for definitions of the words in the definitions will go on *ad infinitum*.”

So let us see how strong our stomachs are. The account I present is based on A. Kosman, “Aristotle's definition of motion”, *Phronesis* 14 (1969).

Actuality and Potentiality

These are correlative terms: a potentiality is a potentiality **for** its corresponding actuality. Of the two notions, the notion of actuality is logically or conceptually prior. So to know what a potentiality is is to know what it is a potentiality **for**.

Some standard Aristotelian examples of actuality-potentiality pairs:

Potentiality	Actuality
Bricks and stones	a house
Bronze	a statue
Seed	a tree

But there is a puzzle here: the actuality of the potentiality in these cases sounds like a **product**, not a **process**. I.e., a **house**, not **housebuilding**. So how can a process be an actuality?

Process vs. product

Many *kinêsis* words (in both English and Greek) exhibit a process/product ambiguity. E.g., “building” can mean either the physical **product** that is produced, or the **process** by which it is produced. Cf. these examples:

Product

The building *is dilapidated*.

The building *has been condemned*.

Process

The building *took place in the spring*.

The building *was interrupted by a strike*.

So we can distinguish between *building_t* (the product) from *building_s* (the process). Might there be a similar ambiguity in *entelecheia*? Since Aristotle is defining *kinêsis* (which means a **process**) it's tempting to read *entelecheia* as "actualization" (a process) rather than as "actuality".

This is a common reading (Ross's commentary on the *Physics*, e.g.). But Kosman objects to this reading, for the following reasons:

- a. It makes the definition of motion astonishingly uninformative:
"Motion =_{df} a process in which potentiality gets actualized."
- b. Aristotle's strange word *entelecheia* does not **mean** a kind of process (although perhaps it does apply to some processes). It means (literally) "having reached a state of completion" or "completedness".
- c. If we read *entelecheia* as meaning "actualization_s", we cannot explain the *qua* clause ("as such") in the definition. For if *entelecheia* means "actualization_s", then the *entelecheia* of **any** potential is a process. So why does Aristotle say that motion is the actualization of potential *qua* **potential**?

Entelecheia as actuality_t.

We might find a way out of this puzzle by reflecting on the question: what is the potentiality in the definition a potentiality **for**? E.g., what potentiality is **housebuilding** the actuality of? There seem to be two possible answers:

- a. The potential **to be** a house.
- b. The potential **to build** a house.

(a) seems wrong: the actuality of (a) is a physical house, a *building_t*, not a process of housebuilding_s. (b) seems to give the right answer: housebuilding is the actuality of the potential to build a house.

But as a definition, this is circular: housebuilding can't be **defined** as the actualization of the potential **to build a house**. In general, it's circular to define **motion** as the actuality of a potential to **move**. (If you don't already know what motion is, this definition won't tell you.)

What our account must look like

So it would seem that the correct account must have these features:

- a. *entelecheia* means **actuality_t** (in the product sense).
- b. the potentiality is the potentiality to **be** (the product), not to **do** (the process).
- c. the definiens applies to the **process** (not the product).
- d. it gives an appropriate place to the *qua* clause, showing what this clause contributes.

The *qua* clause

We begin with the *qua* clause. At 201^a30ff, Aristotle explains it: **bronze** is potentially a statue, but

- a. The actuality of the bronze ***qua* bronze** is **not** a *kinêsis*. Rather, it is *to be bronze* (i.e., the essence of bronze). Similarly, although Aristotle doesn't say so, the actuality of the bronze ***qua* statue** is *to be a statue*.

Presumably, we are to infer that

- b. The actuality of the bronze ***qua* potential** is a *kinêsis*.

According to Kosman, the phrase "*qua* potential" indicates that the potentiality **itself** is to be taken as "the subject of the process of actualization, and not as the privation ... which gives way to the resultant actuality." (p. 50)

Thus we should not think of the actuality of the potentiality as the actuality that comes to **replace** the potentiality (by fulfilling it). Rather, we are to think of it as the **being actual** of the potentiality itself.

Kosman explains this by distinguishing between two senses in which an imperfection can be perfected: **deprivative** and **constitutive**. Consider two cases:

- a. A man with a stutter visits a speech therapist. **His stutter improves.**

- b. An actor must portray a man who stutters. He has difficulty with the role, but keeps practicing. **His stutter improves.**

(a) is the **deprivative** perfection of an imperfection.

(b) is the **constitutive** perfection of an imperfection.

This can be expressed using Aristotle's "*qua*" locution:

In (a), the stutter *qua speech* improves.

In (b), the stutter *qua stutter* improves.

Similarly, in the definition of *kinêsis*: the potential *qua potential* is what is actual. Or, better: **there is a *kinêsis* going on when (and only when) the potential *qua potential* is actual.** So, for Kosman, the *qua* clause "signals that it is the constitutive and not the deprivative actuality which is referred to in Aristotle's definition" (p. 50).

The "actuality of the potentiality" in Aristotle's definition thus does **not** mean:

the potential getting used up and transferred into actuality.

Rather, it means:

the potential being itself actual (i.e., manifested).

Levels of potentiality

This interpretation is viable only if we can make sense of a distinction between something being **potentially potential** and something being **actually potential**. Kosman appeals to Aristotle's discussion of levels of actuality and potentiality in *De An.* II.1 and 5.

Aristotle distinguishes (412^a22-26) between two levels of actuality (*entelecheia*): *knowledge* and *contemplation* are both actualities. But contemplation is at a higher level of actuality. For a person may have knowledge without actually exercising it, or thinking at all; whereas contemplation is the actual exercise of knowledge.

It has become traditional to call these *first* and *second* actuality, respectively. He also distinguishes between two levels of potentiality (*dunamis*) in his fuller discussion in II.5 (417^a22-30):

We must also distinguish types of potentiality and actuality One way in which someone might know_e is the way we have in mind in saying that a man knows because man is a kind of thing that knows and has knowledge;

another way is the way we have in mind in saying that someone who has grammatical knowledge knows. These knowers have different sorts of potentiality—the first has a potentiality because he has the right sort of genus and matter, whereas the second has a potentiality because he has the potentiality to attend to something when he wishes, if nothing external prevents it. A third sort <of knower> is someone who is attending to something at the time, actualizing his knowledge and fully knowing (for instance) this A. In the first and second case we pass from potentially to actually knowing; but in the first case we do so by being altered through learning, and by frequent changes from the contrary state, while in the second case—where we pass from having arithmetical or grammatical knowledge without actualizing it, to actualizing it—we do so in another way.

Physics VIII.4 (255a30-b3) makes the same distinction:

...the fact that the term ‘potentially’ is used in more than one way is the reason why it is not evident whence such motions as the upward motion of fire and the downward motion of earth are derived. One who is learning a science knows potentially in a different way from one who while already possessing the knowledge is not actually exercising it. Wherever something capable of acting and something capable of being acted on are together, what is potential becomes actual: e.g. the learner becomes from one potential something another potential something (for one who possesses knowledge of a science but is not actually exercising it knows the science potentially in a sense, though not in the same sense as before he learnt it).

So we have two levels of actuality, A_1 and A_2 , and two levels of potentiality, P_1 and P_2 . But they only add up to three different things, because:

- a. First potentiality (P_1)
- b. Second potentiality (P_2) = first actuality (A_1)
- c. Second actuality (A_2)

An example may make these distinctions clearer:

- P_1 : ability to **learn** French (in one who does not know French).
 $P_2 = A_1$: ability to **speak** French (= actually knowing French)
 A_2 : actually speaking French.

Note that the ability to speak French—a **potentiality**—is also an **actuality**; for one who is **able to speak** to speak French **actually** knows French. $P_2 = A_1$.

A dog and an infant both are unable to speak French, but in different ways. The dog lacks P_1 , but the infant lacks P_2 . (Presumably, the infant has P_1 .) A silent Frenchman has P_2 (and therefore has A_1). A Frenchman actually speaking French has A_2 .

Change as the actuality of a potentiality

Change is a first actuality (= a second potentiality). There are thus two levels of potentiality involved in change:

- a. Before a thing begins to change, it is only **potentially** a potentially changed thing.
- b. When a thing has begun to change, it is **actually** a potentially changed thing.

The process of change is the being actual of the potentiality of the product of the change. Here is how Kosman puts it with respect to motion:

“When I am in Philadelphia, I am potentially in Berkeley. But that potentiality to be in Berkeley lies dormant, so to speak, until I quit Philadelphia; it becomes manifest, becomes, we might say, actual, only as I embark upon a journey to Berkeley. There is then a sense (so odd that only a philosopher would want to use it) in which situate in Philadelphia I am only *potentially* a potential inhabitant of Berkeley, whereas motoring through Council Bluffs on a pilgrimage from Philadelphia to Berkeley, I am *actually* a potential inhabitant of Berkeley. And so my *journey* to Berkeley is the constitutive actuality of my potentiality to be in Berkeley”

Testing the interpretation

To test this interpretation, we can look at Aristotle’s concluding lines of III.1 concerning housebuilding at 201^b10-15 (my translation):

“For the actuality of the buildable is either housebuilding or a house. But when there is a house, the buildable no longer exists — rather the buildable gets built. Therefore the actuality [of the buildable] must be the housebuilding. And housebuilding is a kind of process. But now the same account will apply to the other processes as well.”

Aristotle’s point is that the buildable (*qua* buildable) cannot be **actual** once the house is in existence. So the buildable, as such, can be actual only while the process of building is going on. Thus, the time interval during which the building is under

construction exactly coincides with the interval during which the potentiality of the buildable is actual.

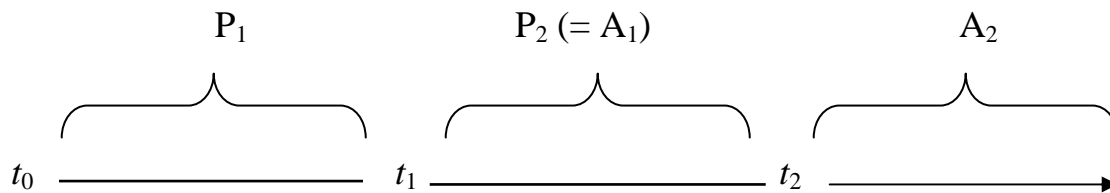
In general: x is in the process of becoming F when, and only when, x 's potentiality to **be** F is actual.

Before the process begins, x 's potentiality to be F is not yet actual — it is only potential. After the process ends, x 's potentiality to be F is no longer actual, for it no longer exists: x is now actually F .

Kinêsis—change—is the **being actual** of the **potentiality** of the potential product to be the actual product.

Diagram to illustrate *kinêsis*

Take Aristotle's example of *housebuilding*: it is a process that consists in the being actual of a certain potentiality of the building materials (bricks, boards, etc.)—viz., their potentiality to **be** a house. Thus, it is a *second* potentiality (P_2).



At t_1 : The process of housebuilding begins.

At t_2 : The process of housebuilding is completed.

Prior to t_1 : There is not *actually* a potential house—there are just bricks and boards.

From t_1 to t_2 : There is *actually* a potential house—the period during which the potentiality (of the bricks and boards) to be a house is actual.

After t_2 : There is (*actually*) an actual house. The potentiality to be a house has been actualized—and so, *qua* potential, it no longer exists.

The *kinêsis* (in this case, housebuilding) is what begins to exist at t_1 and ceases to exist at t_2 . It is the *actuality* of the potentiality (to be a house) of the potential house (the bricks and the boards, etc.).