In VIII.1, Aristotle argues for the eternity of motion: that there always were things moving. The starting point is an instance of the general definition of change (Phys. III.1, 201a10-11), specialised to the special case of motion, and the observation that, even as actualised, a potentiality is always a potentiality of something:

φαθεὶν δὴ τὴν κίνησιν εἶναι ἐνέργειαν τοῦ κινητοῦ ᾗ κινητόν. ἀναγκαῖον ὑπάρχειν τὰ πράγματα τὰ δυνάμενα κινεῖσθαι καὶ ἐκεῖνην κίνησιν. (25a8-11)

Motion, we say, is the actuality of the movable in so far as it is movable. Each kind of motion, therefore, necessarily involves the presence of the things that are capable of that motion. (Aristotle 2014: 92)

Now we say that motion is the actuality of the movable in so far as it is movable. It is necessary, therefore, that there should be objects which are able to move with each kind of motion (Aristotle 1999: 2).

To show the eternity of motion, Aristotle proceeds to show that the coming to be of motion “implies a change previous to the first motion”, which is absurd:

P₁ If there is motion, there must be something movable.

P₂ If the movable does not exist eternally, it came into being.

P₃ If it came into being, then this becoming itself was a change or a motion (metabolē or kinesis), prior to the motion in (P₁).

P₄ The movable cannot exist eternally and always be at rest, for rest is the privation of motion and in need of a cause (aition).

P₅ So if the movable did not come into being, it was either already moving in or it came to be in a state of rest, by a motion prior to the motion in (P₁).

C In both cases, was there motion before the motion in (P₁).

(P₄) is the regarded as the least plausible premise: it says that we need a cause for the fact that the potential of the movable to move was not activated before. It is true that Aristotle does not in general require causes for states of rest (and instead accepts the absence of a cause for motion as sufficient explanation), but the situation here is special, because we are inquiring about the possibility of some movable’s rest-state that has no beginning in time. That this is impossible will Aristotle try to show next: the only thing that could have prevented the movable from moving from eternity is a lack of ‘contact’; overcoming such a lack of ‘contact’, however, requires motion, so there must have been a prior motion to bring the movable into contact with its ‘manifestation partner’, to produce motion. This is said, in so many words, in 251a28-b10:

ἀλλ’ εὖν δει γε δυνατὰ ποιεῖν καὶ πάσχειν ἢ κινεῖν, τὰ δὲ κινεῖσθαι, ὡς πάντως δυνατά ἐστιν, ἀλλ’ ἐξ ἐργών καὶ πληρώσων ἄλλος ἀλλήλως. (251a-b)

But at any rate all things that are capable of affecting and being affected, or of causing motion and being moved, are capable of it not under all conditions, but only when they are in a particular condition and approach one another... (Aristotle 2014: 92)

But things that are able to act or to be acted on, or to move things and be moved, respectively, are not able to interact under any condition whatsoever, but only if they are in a certain condition and approach each other. (Aristotle 1999: 2)

1. Graham (1999: 43) calls it “the most puzzling step”.

2. This is why Graham (1999: 43) feels obliged to add an extra premise: “There must be some change to cancel to cause of [the mover’s] being at rest” – “the need for a cause to eliminate the obstacle or to ‘turn on’, as it were, [the movable]”. But not only is this premise not needed, it is also not Aristotelian: Aristotelian powers, as we have seen, do not need to be ‘turned on’.

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Physics VIII

HS “Aristotle’s Physics”, HS 2017, Philipp Blum, December 4, 2017
I find \((P_3)\) perhaps even more problematic: while becoming-to-be certainly counts as a ‘change’, why should we take it to be \textit{kinesis} in the sense of the type of thing of which the argument is supposed to show that there cannot be a first one?

The second argument infers the eternity of motion from the eternity of time:

\begin{itemize}
  \item \textbf{P}_1\ If time has come to be, it has come to be at an instant. (“Time cannot be thought of apart from the \textit{now}.” / \textit{adunaton estin kai einai kai noēsai chronos aneu tou nun}).
  \item \textbf{P}_2\ The now is a ‘middle’ (\textit{nesotēs}), it has a beginning and end at the same time, “for it is the beginning of the future time and the end of the past” (\textit{archē tou esomenou chronou} and \textit{teleutē tou parelthontos [chronos]}).
  \item \textbf{P}_3\ Because it has both a beginning and an end, there must be time on both sides of the now.
  \item \textbf{C}_1\ So time has not come to be.
  \item \textbf{P}_4\ If there is time, there must also be motion, “if indeed time is a kind of property of motion” (\textit{ho chronos pathos ti knēseos}).
  \item \textbf{C}_2\ So motion has not come to be.
\end{itemize}

The argument from \((P_1-P_3)\) to \((C_1)\) assumes that if time has to come to be, it has come to be at an instant in the sense of a ‘now’ in the sense of \((P_2)\).

\((P_4)\) is not just a statement of ontological dependence: the conceptual connection between time and motion is closer. The idea that time has come into being does not make sense, according to Aristotle, because it would have to happen at some one time. But not only cannot it be at a time (for then there would be a time before that), it also cannot happen at all. The becoming-to-be of time, like any other becoming-to-be, would be a motion and so have an intrinsic temporal structure – but this is impossible, if it is time itself that comes to be, for time just is this: the intrinsic temporal structure of comings-to-be. If such structure cannot come to be, it must have always existed, and so there always were things it was the structure of.

At 25a28-25a25, Aristotle says that the ‘same argument’ shows that motion does not cease to exist: if some motion ceases to exist, only the actuality does, not the movable of which it is the motion; if this movable also ceases to exist, then this is a motion later than the first one, presupposing another movable the actuality of which is the second motion, the ceasing to exist will be a third, subsequent motion etc. I frankly do not find this argument convincing at all. It is one thing to say that if the mover ceases to move that which is moved, then this requires a earlier motion, e.g. a loss of contact. But why think that this motion has to go on until after the first motion has ceased to be? Why could not the actuality go out of existence at the same time as the potentiality, why must the potentiality linger on?

Fortunately, there is no need for a parallel to the first argument (from the definition of motion) if the second argument (from the eternity of time) works: for the second one is perfectly symmetric with respect to past and future and equally plausibly shows that motion cannot have a beginning and that it cannot have an end.

The fourth argument seems to involve something like a causal closure condition (in Aristotle’s sense of “cause”, i.e. perhaps something more akin to a version of the principle of sufficient reason). Again, it proceeds by an investigation of what it would mean for motion to have a beginning, but now asks whether this would be compatible with the “orderly” course of nature (25a11-12). It would not, answers Aristotle, if time is linear, because the coming into being of motion would divide such a time into parts (the time before there was motion, the time after there was motion) that do not stand in a proportion: there would thus be no possible explanation of why motion came into being at this, rather than any other time.

3. Though my reconstruction makes it depend on that assumption, I still find it more plausible as the one ascribed to Aristotle by Graham (1999: 47), which depends on two premises I find problematic: (i) that “[t]he existence of the now is a necessary condition for the existence of time”, which ascribes to Aristotle a two-way dependence relation between the now and time, of “mutual entailment” (1999: 48); and (ii) that we inductively infer that what is true of the now is true for any arbitrary moment of time.
Aristotle concludes VIII.1 by claiming that motion is eternal.¹

In VIII.3, Aristotle argues that some things never move, some always move and some only sometimes move. He does so by arguing against the alternatives.

no motion It is not possible that nothing ever moves, for we may assume that nature is a source of motion, as the contrary claim (that nothing ever moves) “calls into question the whole of experience rather than some part of it and not only in relation to the natural scientist, but in relation to virtually all the sciences and all judgements, since they all make use of motion” (253a34-253b1, 1999: 7).³

no rest It is not possible that nothing ever is at rest, for “nature is a principle of rest no less than of motion” (253b9, 1999: 7), and there is a threshold principle for all four types of motion. For increase/decrease, there must a turning-point: nothing can grow indefinitely (as the universe is finite), not decrease indefinitely (as there are no points); when increase turns into decrease or decrease into increase, the thing underlying the change is at rest. For alteration, a fixed amount of underlying gradual change gives rise to some discrete change at a higher-level: with respect to these higher-level qualities, the thing is at rest before and after that change. For locomotion, it is merely asserted that at least sometimes, things are (at rest) in their natural place.

no starting/stopping It is not possible that nothing ever comes to rest or comes to move, for there would be no coming-to-be and no ceasing-to-be, “[i]f something changes into this, it comes to be this or to occupy this, and if it changes from that, it ceases to be that or to occupy that” (254a12, 1999: 8). This is an interesting observation:² because every qualitative change also brings into being something – at least an accidental unity, white Socrates, or a lesser entity such as the place of the yellow billiard ball (which was the place of the red billiard ball just seconds ago), it is plausible to assume that every substantial change is underwritten by some qualitative change: this change, to be what brings into being something that did not exist before, has to start and cannot have been going on forever.

only starting/stopping That it is not possible that everything starts or stops, is here not shown but merely asserted. The unmoved mover of VIII.5 is always at rest (never starts), the outermost cosmic sphere of VIII.6 is always moving (never stops).

**Physics VIII.4-6: The regress of movers**

Having established that there always is motion and that some things are always moving, Aristotle asks why they are moving, concluding in VIII.6 that they are moved by something which itself is unmoved, an unmoved mover.

 Physics VIII.4 argues that everything that moves is moved by something, distinguishing between incidental / ‘accidental’ (kata sumbebēkos) and intrinsic / ‘essential’ (kath’auto) motion and between motion by nature and motion by force. Things moved by nature are moved by themselves, for nature is their inner principle of change.

Things moved by force move either incidentally or intrinsically. If they are moved incidentially, then this coincidence is what moves them, and so they are moved by something. The difficult case is intrinsic motion by force: why is due to something? This class is discussed by Aristotle under the heading of elemental motion: to what is the motion of the four elements due? Aristotle says that while they move by nature, they do not, strictly speaking, move themselves. Moving ‘by nature’ thus cannot just mean, as it does in

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¹ It is not clear to what extent Aristotle’s arguments apply not only to Anaxagoras’ cosmological model where motion begins once and for all after an indefinite period of rest, but also to Empedocles’ view that motion and rest forever alternate (cf. Graham 1999: 79–80). Perhaps this is partially addressed in VIII.3, where Aristotle considers an objection from the analogy with animal motion, starting seemingly spontaneously. He rejects the analogy, holding that animals, as living things, are always in motion.

² He backs this up with an additional argument which we discussed already at p. ??.

³ It is not, contra Graham (1999: 70–71), an illicit assimilation of coming/ceasing-to-be to “corollaries of motion”, nor an attempt to reduce substantial change to another species of change.
the case of animals and natural things more generally, having an inner principle of change whereby one is moved. In the case of the elements it means having a potentiality that is actualised in a way that makes its manifestation spontaneous in the absence of blockers.

Aristotle illustrates this with the help of the first/second actuality distinction and the example of knowledge. Actualising one’s potential to know dogs, by learning about dogs, brings us into a state where our knowledge about dogs is spontaneously applied whenever the conditions are right (e.g. whenever we see a dog): no further trigger is needed, though of course the manifestation of our knowledge may be impeded (e.g. by sleep). Movement by force of the elements is such an impediment, and their natural motion is a second actuality, a manifestation of an already activated potentiality.

But why do they move the way they do, i.e. what are their natural motions? Aristotle’s answer to this question is instructingly laconic:

καίτοι τοῦτο ζητεῖται, διὰ τί ποτε κινεῖται ἐλκὸν τὸν αὐτὸν ὄπως τὰ κοῦφα καὶ τὰ βαρέα. οὕτως ἐκεῖ οὐκ ἠρέτες, καὶ τὸν τούτον τὸ κοῦφον καὶ βαρεῖν εἶναι, τὰ μὲν τὴν ἀνω τὸ δὲ τὰ κάτω διωρισμένα, δυνάμει δὲ ἐστὶν κοῦφον καὶ βαρεῖν παλλαγής, ὑπέρ εἰρήνης ὅταν ἐπὶ τὸ γάρ ή ὄρος, δυνάμει γέ τις ἐστὶ κοῦφον, καὶ ὃ ἐπὶ γάρ, ἐπί τιν  ἐπὶ δυνάμει (ἐνέχεται γάρ ζητοδιζέμουν μὴ διων εἶναι): ἀλλ’ ἐάν ἀφαίρεθη τὸ ἐμποδίζον, ἑνέργει καὶ ἀεὶ ἀνωτέρω γίγνεται. (Αριστοτέλης)

But, be it noted, this is the question we are trying to answer – how can we account for the motion of light things and heavy things to their proper places? The reason for it is that they have a natural tendency towards a certain position; and this is what it is to be light or heavy, the former being determined by an upward, the latter by a downward, tendency. As we have said, a thing may be potentially light or heavy in more ways than one. As we have said, a thing may be potentially light or heavy in more senses than one. Thus not only when a thing is water is it potentially light, but when it has become air it may be still potentially light; for something may impede it from being up. But if the impediment is removed, it becomes active and goes ever upward. (Aristotle 1999: a)

The contraries of ‘light’ and ‘heavy’ define a dimensional magnitude that is itself ‘spatial’. When water actualises its potentiality to become light / air, it remains its potentiality: it realises it further by an upward movement, and does so spontaneously, i.e. unless it is impeded.

Physica VIII.5 argues that there is a first mover and that it is unmoved, distinguishing between direct and indirect transmission of motion.

The first regress argument reduces indirect to direct transmission of motion. If motion is transmitted indirectly, the transmitting elements must themselves be moved, and indirect transmission must ultimately reduce to direct transmission: something moving something by itself.

A second regress argument concludes that the transmission of motion must originate in something that is – at least under a certain aspect – not itself in motion:

τό δὲ κινοῦν οὖσας ὡςτ’ εἶναι μὴ ὡς κινεῖ, ἀκείνον, ἐπεὶ ὃ ὁμοίως τὸ ἐποντον, ὃ κινεῖθαι μὲν δύναται, κινήσεως δὲ ἀρχὴν οὐκ ἔχει, καὶ ὃ κινεῖται μὲν ὄμη ὑπ’ ἄλλου ἐδὲ ἀλλ’ ἐποντον, κινήσεως, ἵνα μὴ ἀναγκαῖον εἶπομεν, καὶ τὸ τρίτον εἶναι μὴ κινεῖ ἀκείνον ὄν. (Αριστοτέλης 194: στ’)

…and the mover – that is to say, that which causes motion in such a manner that it is not merely the instrument of motion – must be unmoved. Now we see the last things, which have the capacity of being in motion, but do not contain a motive principle, and also things which are in motion but are moved by themselves and not by anything else: it is reasonable, therefore, not to say necessary, to suppose the existence of the third term also, that which causes motion but is itself unmoved. (Aristotle 2014: 941)
But the mover, in so far as it is not the means, is unmoved. When we observe the last moved, which is able to be moved but does not have its own source of motion, and what is moved, not by another but by itself, it is reasonable, not to say necessary, to suppose that there is a third thing which causes motion while being unmoved. (Aristotle 1999: 14)

This is a quasi-conceptual argument: distinguishing, as we can, among the things at least partly responsible for some motion between those that are themselves moving and those that are not, we characterise those of the first class as ‘instruments’, vehicles through which the motion is imparted. It then appears very plausible to suppose that not everything responsible for the motion can be of this kind, i.e. that the second class cannot be empty: something must originate and not just transmit the motion.

The next step in the argument is that the first mover is intrinsically such that it moves, that it itself is unmoved and that it does not move its parts.

*Physics* VIII.6 argues that the first mover is eternal, on the grounds that some of the moving it does is eternal.

**Physics VIII.7-9: The primary motion: of place, continuous, in a circle**

*Physics* VIII.7 spells out different ways in which locomotion, change of place, is the primary motion. Growth and decrease (change in size) cannot be primary, because it by itself only accounts for the element of constancy in change; the variation element must be accounted for in terms of qualitative change, i.e. alteration. This alteration is brought about by a change in something else, an intensification or weakening of some external influence. Ultimately, such intensification or weakening must be due to a change in relative distance, the mover moving closer to or away from what it moves. Aristotle then distinguishes three notions of priority:

τὸ γὰρ πρῶτον, ὡσπερ ἐφ’ ἑτέρων, οὕτω καὶ ἐπὶ κινήσεως ἂν λέγοιτο πλεοναχῶς. λέγεται δὲ πρότερον οὗ τε μὴ ὄντος οὐκ ἔσται τἆλλα, ἐκείνο δὲ ἄνευ τῶν ἄλλων, καὶ τὸ τῷ χρόνῳ, καὶ τὸ κατ’ οὐσίαν. (Aristotle 1999: 954)

As in the case of other things so too in the case of motion the word ‘primary’ may be used in several ways. A thing is said to be prior without which other things will not exist, while it can exist without them, and there is also priority in time and priority in being.

For the primary in the case of motion as well as of other things is said in many ways. For that is said to be prior without which other things will not exist, while it can exist without them, and there is also priority in time and priority in essence. (Aristotle 1999: 22)

In all three senses, locomotion is primary:

**existence** Locomotion is primary with respect to existence, for (i) growth/decrease and alteration presuppose (the existence of) locomotion and (ii) there would be locomotion even if there were no growth/decrease nor alteration, for there must be continuous motion and only locomotion can be continuous.

**time** Locomotion is primary with respect to time because eternal things cannot grow nor decrease and cannot alter.

**essence** Locomotion is primary with respect to essence because growth/decrease and alteration of natural things is for their locomotion, i.e. locomotion is the telos of the changes of the other two types.

*Physics* VIII.8 argues that primary locomotion is in a circle, on the grounds that only circular motion is continuous.

VIII.9 further characterises the eternal circular motion as uniform:

*Physics* VIII.10 finally argues that the first mover must be simple, on the grounds that because its power must be infinite (causing motion that goes on eternally, i.e. for an infinite amount of time), it cannot have any magnitude (either finite nor infinite).
References

