Henning Tegtmeyer

CAN ARISTOTLE’S PRIME MOVER BE A PHYSICAL CAUSE?

Aristotle’s doctrine that there is a prime mover of the whole cosmos is sometimes conflated with the idea that God is the first efficient cause, or the author, of the universe. Basically, there are two authentic principles of Aristotelian philosophy which apparently support this erroneous view: (1) Aristotle’s rejection of an actual infinite; (2) the pre-Socratic principle that nothing can come from nothing, which Aristotle endorses explicitly. From (1) it seems to follow that the cosmos must be finite in both space and time; hence must have a temporal starting-point. By (2), the possibility that the existence of the cosmos comes to be without a cause is ruled out, and this makes an external cause necessary, i.e. a cause that is not identical with the cosmos or some part of it. And the most plausible account of an external cause of the cosmos, one might argue, is creationism, broadly conceived.

In fact, Aristotle’s position is much more complicated than, and hence incompatible with, this failed attempt at giving a physical argument for creation. On the one hand, he teaches that there can be no actual infinite, but on the other hand he argues that the movement of the cosmos is (probably) eternal. Though it might seem otherwise at first glance, the latter does not contradict his claim that there needs to be a prime mover of the cosmos at all; rather it is the most important reason for Aristotle to
make that claim in the first place. Hence Aristotle does not think of the prime mover in terms of authorship and creation in time. Aristotle is not a deist

However, if one asks how Aristotle’s doctrine of the prime mover is to be read instead, a comparison of the crucial passages in *Physics* Θ and *Metaphysics* Λ will lead to a rather confusing and apparently problematic picture, as many critics have observed. That such a comparison can bring out a coherent theory of first causation has often been doubted. In what follows, however, I will follow the hypothesis that the obvious difficulties in making sense of Aristotle’s different treatises about the prime mover have at least to a large extent to do with the difference between physics and metaphysics.

1. *The unmoved mover – an alien element of Aristotle’s Physics?*

To start with, why does Aristotle’s physics contain an unmoved mover at all? To be sure, some famous modern physicists, e.g. Newton and Einstein, make theological claims in their works, too. Nonetheless, it seems clear enough that these are not genuine parts of their physics; we can rather make sense of them in terms of meta-level assertions that are intended to relate physics as a whole to other disciplines such as metaphysics or theology and to cast light on the relation between knowledge and faith. In Aristotle, by contrast, things seem to be different insofar as his whole physics are arguably heading towards the doctrine of the prime mover almost from the start, i.e. by raising the issue of principles and first causes of motion. The positive doctrine that there must be a prime mover is prepared in H 1 (241 b), i.e. by the claim that every motion must be caused by something definite and that chains of causal relations cannot be infinite (*apeiron*). And then Θ, the last and most voluminous book of Aristotle’s *Physics*, is dedicated almost entirely to the problem of eternal cosmic motion and to the necessity of its being caused by something that is not moved itself. Is this a violation of the Aristotelian principle that each science is defined and delimited by its object? Aristotle himself determines motion as the proper object of physics. It is true that he also holds that science deals with oppositions, and motion is opposed to rest. But the concept of rest is not applicable to the first mover since only movable objects are capable of resting. As an unmoved mover, the god of Aristotle’s physics is beyond movement and rest; hence this god does not fall within the scope of physics.

---


One might object that the separation between physics and metaphysics is not as strict in Aristotle as it has become in modern philosophy. Overlapping universes of discourse seem to be even constitutive for the philosophy of the Stagirite. For example, in Metaphysics Z, which certainly is the centrepiece of his whole first philosophy, he takes up physical propositions in a systematic manner and exploits them for the purposes of metaphysics. For example, consider the way in which the doctrines of substance, matter and form, motion and causation, act and potency have both a physical and a metaphysical aspect. In the light of this observation, one might feel tempted to argue that there is more continuity than discontinuity between physics and metaphysics for Aristotle, so that demarcation problems lose their importance. Against the background of such a reading, the doctrine of the unmoved mover appears to be either a harmless duplication or perhaps an early version of the more mature argument in Metaphysics Λ.

Against this Irenic reading, however, one has to recognise the fact that Aristotle himself defines physics and metaphysics as clearly distinct disciplines. The realm of physics is being in motion; its task is to explain motion by reducing it to its causes. The realm of metaphysics, by contrast, is being as such, or being as being; its task is the explanation of being in terms of the first causes of being. Nonetheless, overlapping universes of discourse are not problematic in principle from an Aristotelian point of view since, for Aristotle, two scientific disciplines might stand in a subordination relation to one another, such that one is more general and the other more specific. For example, geometry is a sub-discipline of mathematics since geometry is about continuous magnitudes whereas mathematics is about magnitudes in general. And it seems that this is precisely the relation that obtains between physics and metaphysics. Now, since every entity in motion is an entity, but perhaps not every entity is also in motion, metaphysics is perhaps more general than physics. Moreover, one could even imagine that there are no unmoved entities. In that case physics and metaphysics would simply coincide, as Aristotle observes. In spite of their possible coincidence, however, the tasks of the two disciplines would still differ. In any case, however, the physical universe of discourse must be contained within that of metaphysics, notwithstanding the fact that physics raises questions that are foreign to metaphysics, e.g. about the number of different forms of movement, about the nature of life or about the mode of existence that has to be attributed to the vegetative all. Apparently, one does not have to share the premise in order to come to the same conclusion as he does. Cf. W. Wieland, Die aristotelische Physik. Untersuchungen über die Grundlegung der Naturwissenschaft und die sprachlichen Bedingungen der Prinzipienforschung bei Aristoteles, 3. edition, Vandenhoeck und Ruprecht, Göttingen 1992, pp. 335-338. Helen Lang suggests that Physics Θ is not about the prime mover in the first instance but rather about first movement; cf. H.S. Lang, Aristotle’s Physics and Its Medieval Varieties, SUNY, Albany 1992, pp. 92 ff.

A subtle argument to the effect that physics and metaphysics form different aspects of one integral theory is presented by K. Oehler, Die systematische Integration der aristotelischen Metaphysik. Physik und Erste Philosophie im Buch Lambda, in Dering, Naturphilosophie bei Aristoteles und Theophrast, pp. 168-192.

Heidegger seems to suggest such a reading at least tentatively; cf. Heidegger, Vom Wesen und Begriff der physis, p. 241.

or the sensitive soul\(^{12}\). The objects of a specific science are an actual part of the objects of a more general science, whereas its questions and problems are only virtually contained within the more general ones\(^{13}\).

So the guiding question for a discussion of the physical argument for a prime mover must be: Why does the prime mover, or Aristotle’s God, become a concern for physics in the first place? Pointing out that Aristotle does not use the term ‘god’ (\textit{theos}) in his \textit{Physics} but rather speaks of a first mover in an indeterminate fashion instead does not solve the problem because Aristotle himself determines this entity as undivided (\textit{adhaiireton}), uncomposed (\textit{amerès}) and unextended, i.e. incorporeal (\textit{oudèn echon mégethos}), and further as eternal (\textit{aei}) and unchangeable (\textit{akineton})\(^{14}\). Without any doubt, all these are attributes of the deity that re-emerge in Aristotle’s metaphysical theology. This consideration in turn provokes a second question: Given the Aristotelian hypothesis that the order of cosmic movements is eternal, why should an unmoved prime mover be necessary to explain it nonetheless? Why does it not suffice to appeal to a thoroughgoing efficient causal nexus between moving bodies, as many materialists assume?

\section*{2. Motion needs a cause}

Aristotle wants to convince us that there can be no motion without a cause\(^{15}\). The reason for this is the following: Motion is always the motion of something, usually of a material substance\(^{16}\). The cause of motion, however, can only be found in something else since everything that moves or is changed is moved or changed by something else. Aristotle wants to prove the minor premise inductively. Therefore, he first distinguishes different kinds of motion. Something can be moved (1) either accidentally or as such. If the latter is the case then (2) the cause of motion might be either in the moving entity itself or in something else. Again, if the latter holds, the motion might be either natural or violent\(^{17}\). Being moved accidentally might occur in two ways: Either a thing is affected by the movement of something else without actually moving itself (e.g. a skipper who stands still on deck of a moving ship is moved accidentally, i.e. by standing on a ship that moves)\(^{18}\). Or a thing is moved insofar as it is moved (e.g. a look-out standing still on a watchtower moves himself insofar as his head and

---

\(^{12}\) Cf. \textit{Metaph.} 1025 b.

\(^{13}\) Cf. Suárez about the question why there are many sciences rather than only one, i.e. metaphysics, in F. Suárez, \textit{Disputationes metaphysicae I}, reprint Olms, Hildesheim 1965, d. 1.2.


\(^{15}\) Cf. \textit{Phys.} E 1, 241 b.

\(^{16}\) \textit{Metaph.} K 12, 1068 b, informs us that what makes something susceptible for motion and change is matter; which means that only material substances are capable of moving and being moved, or of changing and being changed.


\(^{18}\) In his commentary, Aquinas brings in another example: A musician can heal a sick person accidentally because having the capacity to heal is accidental to having the capacity to make music. With this example, Aquinas wants to underline that «accidental movement» is a very broad concept that covers a wide variety of heterogeneous phenomena.
his eyes are moving). It is clear from the examples that accidental movements can be reduced to movements *simpliciter* since what is moved by accident is moved because something else is moved as such (e.g. the skipper and the look-out are moved accidentally because the ship and the look-out’s head are moved as such).

Now, if something is moved as such by something else this already implies that the cause and principle of motion are to be found in the latter. This is most evident in the case of violent movements. Violent movements have an external cause, i.e. they are movements that are forced on something. A stone cannot be thrown at something without a thrower, and that cannot be the stone itself. By contrast, one might doubt whether things that move naturally are moved by something else at all. One might at least imagine that falling stones or rising steam are not moved by an external cause at all. Or think of self-movers like animals. At least it does not seem obvious that moving animals are always moved by something else. Aristotle himself pays special attention to these two kinds of movement. Regarding the natural movements of inanimate bodies, e.g. of pieces of determinate matter like stones or steam, he first excludes that these are cases of self-movement\(^\text{19}\), because in order to be self-movers, inanimate bodies would have to be capable of initiating or stopping their own movements, hence to have the kind of two-way capacities that Aristotle ascribes to living beings. But fire and water, falling stones and rising steam do not control their movements; they rather move on until they are stopped by something else. Nonetheless, fire and steam move upwards by nature whereas stones and rain move downwards according to their nature. None of these cases of natural movement requires a violent push from outside to get started\(^\text{20}\). Why is that so? Well, inanimate bodies are potentially in motion and potentially at rest. Both motion and rest are either natural or enforced. This is why we say of a stone that it can both lie on the ground and fly through the air. However, the two ‘cans’ in the previous sentence have two different meanings. Lying on the ground is in accordance with the nature of a stone since a stone is heavy. Hence flying through the air is against its nature but nonetheless possible. This is also the reason why it is possible that a granite block is at rest six feet above the ground, that is if there are pillars that support it and keep it from falling down. The latter is an example for enforced rest. If one removes the pillars the natural potency of the granite block is actualised instantaneously, and it falls to the ground. Both the lifting of the block and its resting on the pillars have external causes, and so has its falling down after the removal of the pillars, but each cause intervenes in a peculiar way. For example, builders cause the block to rise by using a lever. Its rest in an elevated, hence unnatural position is caused by installing an obstacle against falling down; finally, the falling down is caused by removing the obstacle\(^\text{21}\). The first is an example of enforced movement, the second of enforced rest, the third of natural movement. Eventually, the


\(^{20}\) Cf. Müller, *Naturgemäße Ortsbewegung*, pp. 88 ff. Müller himself, following Simplikios, claims that inanimate bodies are always moved by immaterial forms. I tend to find this rather hard to accept. In any case, Müller is right to emphasise that Newton’s theory of gravitation offers a radically different solution.

granite block comes to lie down on the ground, and this is an example of natural rest\textsuperscript{22}. The case of water is similar. Its nature is to be cold and heavy; hence its natural position is at the bottom. At the same time, water has a potency to become hot and turn into ‘air’, i.e. into steam. Steam is light and rises upwards until it loses its heat and turns back into water again, and since water is heavy it cannot fail to fall down again unless an obstacle is installed\textsuperscript{23}. In each case, an external agent is required to initiate the movement, but agents intervene in different ways each time. Even enforced rest needs an external cause, i.e. an external obstacle against natural movement; only natural rest has no further causes since it is the simple actualisation of the natural potency of an inanimate substance.

Now, how about self-movers? It seems that animals, human beings and even plants do not need an external moving cause to be set into motion since they embody a principle of movement themselves, i.e. life. However, according to Aristotle, this is not really correct. It is true that living beings possess an active potency to move themselves in addition to the passive potency to being moved; and this is the crucial difference between animate and inanimate substances. Nonetheless, the claim that living beings do not need an external principle of movement in order to move is not correct in two important respects. First, living beings do not move themselves as a whole since it is always possible to distinguish between a part that causes movement and another part that is moved. Nothing exerts a causal influence on itself without further qualification\textsuperscript{24}. In the case of living beings, the soul is what causes movement whereas the body is what is moved. Second, living beings are not first movers, neither with respect to their existence nor with respect to their operations. Living beings exist because they are procreated by conspecific living beings, and their operations are ultimately caused by contacts with their environment that stimulate their souls to initiate certain bodily processes, as in perception-guided animal behaviour. Therefore, even living beings move themselves due to external causation, although their operations, unlike the movements of inanimate bodies, are mediated through an internal mover, i.e. their souls.

Furthermore, it is obvious that both the mover and the moved can be part of overarching and interconnected movements\textsuperscript{25}. Aristotle mentions the example of a pool of water whose surface is stirred by a stick. The stick stirs the water because it is itself moved by a hand, which in turn is part of a living human body, etc. At the end of this chain of movements that are caused by other movements we find a human soul, i.e. the will of the person who moves the stick with her hand and thus initiates the movement of the water. And so it is with at least all finite chains of movements. There has to be an initial mover to get the whole chain started. And so Aristotle reaches his intended conclusion at least for every finite motion.

\textsuperscript{22} One might even argue that this is a case of enforced rest again since it is the ground which keeps the granite block from falling further. A possible reply could be that a resting position can be regarded as both natural and enforced but not in the same respect. So it is natural for a stone to lie on the ground, but as soon as the ground is removed the stone will by its own nature fall down deeper until it reaches ground level again.

\textsuperscript{23} Aristotle regards the water cycle as a case of natural movement in spite of the fact that external agents are involved, i.e. the sun, fire or something similar. Cf. \textit{Aristotle, Meteorologica}, transl. by E.W. Webster, in Ross, \textit{The Works of Aristotle}, vol. III, Clarendon, Oxford 1931, A 3, about the natural transformation of the elements.

\textsuperscript{24} Cf. \textit{Phys.} H 1, 241 b f.; \textit{Θ} 4, 255 a.

\textsuperscript{25} Cf. \textit{Phys.} \textit{Θ} 5, 256 a.
Now, this might raise a new worry, i.e. whether there can be something like an initial motion at all. For example, consider the person who moves the stick to stir the water once again. In one sense one might call her a first mover but in another sense not at all since we have reason to assume that she is moved (motivated) by something to move the stick, perhaps by a certain practical consideration, by curiosity, by a strange impulse or by something alike. Does this mean that we get lost in a possibly infinite causal regress? For Aristotle, however, this point does not seem difficult since every motion that has a certain extension in time, i.e. a beginning, a continuation and an end, can be regarded both as a whole and as part of a larger, more comprehensive process anyway. That leaves room for two opposed limiting cases: on the one hand dependent parts of a movement that cannot be regarded as complete movements themselves (e.g. an instantaneous physiological event that is part of the movement of a certain limb), on the other hand independent integral movements that can by no means be regarded as parts of an overarching process. For Aristotle, there is only one instance of the second type, and that is the whole of all cosmic movements taken as one. Still, causal interventions might be required to keep a process going; so there is no contradiction between saying that an act of the will causes the stick to move and stir the water, on the one hand, and saying that the act of the will is motivated by something else. From an Aristotelian perspective, this holds for the limiting cases as well: Both instantaneous movements and the motion of the cosmos need an external cause.

But why should the latter be true? Does not Aristotle himself teach that the movements of the celestial bodies are effortless? But then it seems that an important reason for assuming that a cause is needed falls away. We tend to assume, and so does Aristotle, that causes are required to explain changes, notably by overcoming obstacles against change. But in the case of the movement of the cosmos, no change of the relevant sort seems to be forthcoming since cosmic movement is assumed to be eternally the same. So it seems that the analogy between finite and infinite movement breaks down.

3. Cosmic first motion

It does not seem that Aristotle himself takes this objection seriously since the causal principle serves as an axiom of physics. Every motion has a cause (at least one), and since the motion of the cosmos is a motion it must have a cause as well. Are there reasons in favour of applying this principle to cosmic motion, as Aristotle does? First, we should note that the motions of the celestial bodies are genuine cases of motion, in spite of their calm and effortless character; moreover, they are even cases of extremely rapid motion, as Aristotle points out. This claim is not standpoint-relative. Even if one regards the cosmos as having a static order – its parts are not static at all; they rather move with sublime regularity. However, celestial bodies are not self-movers since they do not have souls. Hence, there must be movers which are responsible for cosmic motion. Now, before one objects that this is a petitio principii it might be the right time to consider the peculiarities of cosmic motion once again. The planets move

---

26 Cf. Phys. H 1, 242 b; De caelo, A 1, 268 a f.

27 Note that motivation is not necessarily identical with causal determination. Hence it does not follow from the above considerations that Aristotle should be regarded as a ‘compatibilist’.
at a constant pace on regular orbits (whether the orbits are circular or elliptical is of
minor importance for the overall consideration). And this fact in itself guarantees
their unlimited or perhaps even eternal duration. Moreover, it seems that this kind of
motion cannot be caused by the planets themselves, i.e. neither by some of them nor
by the causal interaction between them all, because the ordering principle of the whole
planetary system cannot be generated by the celestial bodies that are subjected to it.
In order to see the point more clearly, let us note that it is irrelevant whether we posit
intermediary moved movers between the prime mover and the heavenly bodies, or
whether we let the prime mover move the heavenly bodies immediately. If we choose
the first option the moved movers need to be moved by something; so the intended
conclusion is reached in this way, too. And since the cosmos is one and unitary, Aris-
totle infers that there can be either only one prime mover or one supreme prime mover
in case there are many. The thought that there might be a multiplicity of prime movers
of equal rank and power is incompatible with the idea that there can only be one cos-
mos, which is explicitly endorsed by Aristotle.

19th and early 20th century materialism held that the positing of material forces
and powers (e.g. gravitational force, electromagnetism, etc.) allows us to discover uni-
versal laws of bodily motion which hold for the microscopic sphere of the subatomic
particles and for the macroscopic sphere of the astronomic bodies alike, thus render-
ing the assumption of an external causal force unnecessary. It was in line with this that
Laplace, when asked by Napoleon Bonaparte what the position of God in physics is,
responded that he could do without this hypothesis for astronomy. The argument has
a perfectly Aristotelian structure; Aristotle himself argues that it is better to reduce the
number of possible kinds of causes as much as possible, rather than to multiply them
beyond necessity. Moreover, unlike George Lemaître’s big bang theory, Laplace’s
astronomy is compatible with Aristotle’s assumption that the cosmos is eternal, hence
it is a suitable candidate for a comparison.

Is Laplace right? As a matter of fact, classical modern physics explains movements
but presupposes motion. The Newtonian laws of bodily motion are conditional; they
determine causal factors that obtain between causally inter-related bodies that are
already in motion. This holds for Laplace’s astronomy, too: Laplace claims to explain
why the solar system does not collapse, given that the planets move around the sun
on elliptical orbits. He does not need a god to keep the orbits stable. But the very
existence of a system of planetary orbits is not explained but taken for granted. Sim-
ilar things can be said about the microscopic sphere. Surprisingly enough, it does not
make a huge difference with respect to the point in question if one assumes, like Aris-
totle, that matter is essentially passive, or if one holds, like Galilei and Newton, that
matter is endowed with active powers as well. Aristotle thinks that the fact that there
is an order of perpetual cosmic motion needs an explanation in terms of a cause. La-
place’s atheistic materialism does not offer an alternative but rather refuses to give
such an explanation. We will return to this problem below.

But perhaps another reason why we moderns tend to overestimate the achieve-
ments of Laplace’s physics is the fact that Aristotle is very reluctant to say something

28 Cf. Phys. Θ 1, 250 b.
29 Cf. Phys. Θ 6, 259 a.
definite about the nature of first causation or the essence of the prime mover in *Physics* \(\Theta\). The above mentioned attributes of the prime mover are entirely negative. In his commentary on Aristotle’s *Physics*, Aquinas writes that Aristotle takes God to be the first mover of the universe, not only as a principle of motion but even as a transcendent, a-temporal first cause, i.e. as the first efficient cause of the cosmos\(^{30}\). But Aristotle does not commit himself to this view in *Physics*. His prime mover is obviously immaterial, and he has other attributes which many philosophers ascribe to the gods. He even mentions approvingly Anaxagoras who says that a cosmic *nous* is the first cause of the cosmos\(^{31}\). But if one looks for a more precise determination of the nature of the prime mover or of the kind of causality that transpires from the prime mover to the cosmos in *Physics* \(\Theta\), one looks in vain.

Might not this be taken to be an indication of how scrupulously Aristotle himself distinguishes between physical and metaphysical problems? The order of cosmic motion shows us that there is a transcendent first cause, and without this result the investigation of nature as being in motion would be severely incomplete. Nonetheless, the essence of this kind of transcendent cause cannot be determined in terms of a science of nature, and the kind of causality that is involved cannot be analysed in physical terms. This is why Aristotle has to refrain from a closer inspection within the limits of physics. So it seems that both claims are true: The thought that there is a prime mover goes beyond both the realm and the method of physics. Nonetheless, the prime mover must be addressed by physics because it has a crucial and thoroughgoing impact on nature; hence every analysis of natural causes that disregards prime causality is incomplete\(^{32}\).

\(^{30}\) Cf. *THOMAS AQUINAS*, *Commentaria in octo libros physicorum* VIII, lectio 2. Aquinas stresses both the difference between Aristotle’s idea of first causation and the Christian idea of creation and the points of convergence between the two. In his own theology, *Physics* \(\Theta\) becomes the starting-point for the proof that God exists in *Summa contra gentiles* I, 13. Besides, in his commentary on Aristotle’s *Metaphysics*, Aquinas stresses that the eternity of the cosmos is not proven but merely dialectically assumed by Aristotle. Cf. Id., *In duodecim libros metaphysicorum Aristoteli expositio*, edd. M.R. Cathala - R.M. Spiazzi, Marietti, Torino 1950, XII, lectio 5. Sarah Broadie holds that the prime mover in *Physics* \(\Theta\) is an efficient cause whereas *Metaphysics* \(\Lambda\) presents God as final cause; cf. S. BROADIE, *Heavenly bodies and first causes*, in G. ANAGNOSTOPoulos (ed.), *A Companion to Aristotle*, Blackwell, Oxford 2009, pp. 230-241, here p. 240. By contrast, Jean-Baptiste Gourinat suggests that Aristotle could have presented God as the first efficient cause of the cosmos in *Physics* \(\Theta\) but does not do so; cf. J.-B. GOURINAT, *Le premier moteur selon Physique VIII et Métaphysique A. Physique et philosophie première*, in M. BONELLI (éd.), *Physique et métaphysique chez Aristote*, Vrin, Paris 2012, p. 175-206, 201 ff. Enrico Berti even goes so far as to suggest that even *Metaphysics* \(\Lambda\) should be read as representing Divine causation in terms of efficient causation; cf. E. BERTI, *La finalità del Motore Immobile di Aristotele tra Metafisica L 7 e L 10*, in *Il Dio di Aristotele. Nuove prospettive*, «Humanitas», 66 (2011), 4, Morcelliana, Brescia, pp. 555-567. I would like to thank one of the anonymous referees for directing my attention to this intriguing paper. Berti adds that there is, in his view, a certain affinity between the activity of Aristotle’s prime mover and that of the demiurge in Plato’s *Timaeus* (p. 562), in spite of the enormous differences between Plato’s and Aristotle’s respective cosmologies (p. 564). I have to confess, however, that I find it hard to give robust textual support for this interpretation. A major difficulty for Berti’s view can be found in the fact that Aristotle associates the highest form of pleasure, which he ascribes to God, with contemplation and leisure. I am not convinced by Berti’s attempt to resolve this difficulty; cf. ibi, pp. 558-559.

\(^{31}\) Cf. *Phys*. \(\Theta\) 5, 256 b.

\(^{32}\) In order to see that this is not an isolated case in Aristotle’s work, just think of the last book of the *Nicomachean Ethics*, transl. by W.D. Ross, in *Ross, The Works of Aristotle*, vol. IX, Clarendon, Oxford 1925. Strictly speaking, the theological mediations that occur there are beyond the limits of ethics; nonetheless they are necessary to complete the account of human eudaimonia which is promised in the first book.
4. Prime motion in metaphysics

In metaphysics, however, Aristotle adds intellect (nous), goodness (kalon), self-knowledge (noesis noeseos), joy (hedone) and life (zoe) to the attributes of the prime mover and calls this entity God\textsuperscript{33}. He also determines the kind of causal power that the prime mover has as final causality since this seems to be the only way to reconcile the immobility and inalterability of the prime mover with the idea that the prime mover is a first cause\textsuperscript{34}. How are these determinations all of a sudden possible within a metaphysical framework?

As explained above, the difference between physics and metaphysics is that physics considers being insofar as it is in motion whereas metaphysics considers being as such, that is as being. Within a metaphysical investigation of being, two fundamental contrasts become dominant that play a role in physics, too, but are less central there: All entities are (1) either substances or accidents, and they are (2) either potential or actual beings. The contrast between substance and accident is taken from Categories\textsuperscript{4} and determines the possible forms of movement that need to be explained in physics: Every movement is either substantial or accidental. This is the reason why Aristotle says that «movement» (kinesis) has as many senses as «being»\textsuperscript{35}. Hence, generation and destruction are substantial movements whereas all the other forms of movement – growth and decline, locomotion and qualitative change – are accidental, because they do not affect the existence of a substance but merely its accidents. Therefore, the pattern of the four causes of movement must be adapted to the kinds of motion that need explanation: the formal cause of the generation of a substance is of a different type than the formal cause of locomotion or qualitative change, etc. Nonetheless, neither substantial nor accidental being as modes of being are analysed as such in physics.

The same holds for the act-potency contrast. Arguably, it does not even come to the fore in Physics, even though Aristotle defines movement as the actualisation of potency\textsuperscript{36}. The framework of a physical exploration of movement does not leave much room for a deeper analysis of this distinction. Hence potencies are addressed mainly as possibilities of movement, including matter as an important bearer of motion. How precisely the act-potency contrast is grounded in being must remain open within the limits of physics. In spite of its limitations, however, physics paves the way for a metaphysical investigation of substance and accident, act and potency, most of all by discovering the difference between first and second entelechies, together with their correlates, i.e. first and second potencies\textsuperscript{37}. The distinction between first and second entelechies is of utmost importance for metaphysical thought because it enables metaphysics to account for the difference between two radically distinct modes of being, i.e. of living beings versus inanimate substances.

\textsuperscript{33} Cf. Metaph. Λ 7, 1072 b; 1074 b.
\textsuperscript{34} Cf. Metaph. Λ 7, 1072 a.
\textsuperscript{35} Cf. Phys. Γ, 201 a.
\textsuperscript{36} Phys. Γ, 201 a: «He tou dynámei ontos entelécheia he toioouton, kinesis estin».
On the level of metaphysical speculation, however, the act-potency contrast turns out to be the key to understanding not only motion but also substantial being itself. Therefore, the exploration of substance that starts with book Z and is continued in H can only be completed in Θ, in which the differences between, on the one hand, potentially and actually existing substances and, on the other hand, the potencies and acts of actual substances become crucial. The guiding question is already raised in Z: Are there immaterial substances, or is a substance necessarily composed of matter and form? The answer to this question, however, cannot be given before these distinctions are available. Considering the differences between these modes of being, one eventually arrives at the following provisional correlations: Potencies seem to be grounded in matter whereas acts are rather grounded in form. This transpires mainly from the contrast between potential and actual substances. A certain portion of suitable matter merely has the potential to become a determinate substance as long as it has not received the substantial form (eidos) in question; as soon as that happens, an actual substance comes into being (energeia é). The reception of substantial form is the goal and the good of the potency in question since a potency exists for the sake of its actualisation. The reverse holds for what is bad, however, because a bad act is either the actualisation of a deficient potency or a deficient actualisation of potency. Hence, the act is worse than the potency in these cases. However, in case a substantial form unites with matter this is always good. The form in question might still be actualised in a deficient manner, but then the reason for the deficiency has to be sought in matter. This consideration brings us into a position to form the following speculative hypothesis: If there is something that is pure form and hence pure act this must be something that is absolutely good in itself.

In the case of material substances (ousiai syn te hyle), however, things are not as transparent as one wishes them to be and as metaphysical speculation renders them eventually, because the difference between active and passive potencies complicates the overall picture considerably. Qua being material, these substances are bearers of passive potencies; i.e. they are subject to being changed in both substantial and accidental respects. But it takes a further agent to bring about such a change; auto-kinesis is a limiting case of passivity, and the change cannot be brought about by a passive potency alone; an intervening active potency is required in addition. Agency thus becomes the efficient cause of change. The underlying active potency in turn is either grounded in the agent or induced in it by a further agent. In the former case, the active potency can only be grounded in the soul or form of the agent and not merely in the body qua matter, notwithstanding the fact that it takes matter to cause changes in material substances. Agents that possess active potencies are living beings. In the latter case, by contrast, the relevant active potency is transmitted from one agent to another. For example, heating a pot will

---

38 Cf. Metaph. Θ 1, 1046 a: «Επί πλέον γαρ εστίν η δύναμις καὶ η ἐνέργεια τον μονον λεγομενον κατὰ κίνησιν». In first philosophy, however, act and potency have a more fundamental meaning, as Aristotle points out in the following passage.

39 The analysis starts with accidental potencies and acts; the contrast between actually existing substances and those that are merely potential is introduced in Metaph. Θ 6, 1048 a f.

40 Cf. Metaph. Θ 8, 1050 a 15 f.

41 Cf. Metaph., Θ 9, 1051 a.

42 Metaph. Z 15, 1039 b.

43 Cf. Metaph. Δ 12, 1019 a.
enable it to heat the water it contains. Active potencies of this kind can be transmitted
by both animate and inanimate substances. Note also that active and passive potencies
are ontologically identical but conceptually distinct in these cases\(^\text{44}\), in contrast to both
active potencies of the former kind and to acquired active potencies, or habits. It turns
out that active potencies enjoy a certain metaphysical priority over passive potencies,
and that the corresponding acts are prior to mere potency.

The primacy of acts over potencies is also mirrored in the fact that potency con-
cepts cannot be defined unless correlated acts are mentioned\(^\text{45}\); the concept of act, by
contrast, cannot be defined at all but merely elucidated inductively by giving exam-
ple\(^\text{46}\). This logical fact reflects the ontological and axiological significance of acts
and the ontological subordination of potencies to acts. This observation corroborates
the above hypothesis: If there is a substance that is purely actual it must ipso facto be
better and more perfect than a substance that possesses non-actualised potencies. For
example, only a purely actual substance can be eternal since corruption presupposes
destructibility; destructibility, however, is a passive potency\(^\text{47}\).

Against the background of these metaphysical considerations, Aristotle can sum
up the most important arguments for the necessity of a prime mover from \textit{Physics} \(\Theta\)
in \textit{Metaphysics} \(\Lambda\); now highlighting the metaphysical contrast between the possible
and the necessary. At the same time, the theory of substance from \(Z\) and \(H\) is com-
bined with the analysis of act and potency. At least a preliminary answer to the guid-
ing question is now possible: There are at least two but not more than three kinds of
substances. There are material, perceptible substances, some of which are eternal and
incorruptible (the celestial bodies), whereas others are corruptible (sublunary material
substances). Besides and beyond this, there might also be, as a third substance kind,
immaterial, imperceptible substances, which are then also eternal and incorruptible,
given what has been said so far. Now, Aristotle’s aim in \(\Lambda\) is to show that the very
existence of perishable and imperishable substances cannot be accounted for unless
there are also immaterial substances. Admittedly, these are the most thrilling, but at
the same time the most difficult considerations in this fragment of natural theology.
Let us try to bring at least a little light into them.

On his way towards his goal, Aristotle notes that two last, or rather first, sub-
stantial causes emerge that are not subject to change themselves anymore but rather
make change in everything else possible, i.e. ultimate matter and ultimate form (\textit{ta
eschata})\(^\text{48}\). With respect to matter, this claim refers us back to prime matter (\textit{prote
hyle}), which, as the ultimate ground of potentiality, cannot exist as actual and there-
fore can never become an object of perception; nonetheless it has to exist as pure
potency if there is to be potential being at all. Similar things can be said, \textit{mutatis
mutandis}, about ultimate form which, as the first cause of actual being, can only be an
actual entity without any admixture of potency. The nature of such an entity, however,
must remain undetermined at this stage of the investigation. Nonetheless, it is clear

\(^{44}\) For example, the passive potency to become hot is the same as the active potency to heat other
things after having become hot.

\(^{45}\) Cf. \textit{Metaph.} \(\Theta\ 6, 1049 b\).

\(^{46}\) Cf. \textit{Metaph.} \(\Theta\ 6, 1048 a\).

\(^{47}\) Cf. \textit{Metaph.} \(\Theta\ 8, 1050 b\).

\(^{48}\) \textit{Metaph.} \(\Lambda\ 3, 1069 b\ f\).
that such a self-contained pure actuality cannot be the separate form of a material substance. Remember that one of the chief objections against Plato’s doctrine of the ideas that Aristotle raises is that the forms of material substances may have a separate existence in the intellect but not outside it. The same is shown to be the case for numbers and geometrical forms in *Metaphysics* M and N. Hence the substantial form that is looked for here must be of an entirely different type and cannot relate to material substances at all.

Still, such an ultimate form must be the cause of something since, according to Aristotle, actual being implies causality. But this means that ultimate form cannot be a merely potential cause of something as it is the case for the potencies of material substances. Rather, it must be an actual cause, and this means: an eternal, continuous and incessant cause. And since Platonic forms are ruled out as possible candidates from the outset, the only remaining candidates are purely intellectual substances. At least one such pure intellect must exist, given the fact that the perceivable cosmos is formed. There must be a cause for the forms within the cosmos. And this can only be a form itself since only forms cause forms and only substances cause substances\(^{49}\). From the characterisation of the ultimate form as intellect, the above mentioned Divine attributes of the prime mover follow without further difficulty.

However, one might object that the pure intellect which Aristotle calls God does not have to be numerically one; so perhaps Aristotle’s argument implies theism but not monotheism. Besides that, it is not clear yet how a pure intellect can cause motion, given that motion is necessarily bodily and has to be induced by something bodily. Let us start with the latter difficulty. The idea that a pure intellect could exert causal powers appears to be incompatible with the claim that a pure intellect, in virtue of being pure act, is inalterable, because causality is an actualisation of potency, i.e. a change. In line with this, Aristotle teaches that acts do not only change the patient but also the agent. In effect, this consideration only rules out efficient causality. In order to be the efficient cause of motion, the prime mover would have to move since only movement can cause motion. This is incompatible with the concept of an unmoved mover. At further reflection, however, we can also rule out material and formal causality. A pure, immaterial intellect cannot be the material cause of things. Nor can it be a formal cause since forms can only be caused by similar forms; but the prime mover, qua pure form, does not resemble the forms of material substances sufficiently. Hence only final causality remains as a possible option and is therefore embraced by Aristotle. This is why he says that God moves things like something that is known, desired or loved (*noeton, orekton, erómenon*)\(^{50}\). Only a final cause can move something without moving, i.e. by being recognised as good or at least taken to be good. And this seems to hold for a purely intellectual being, at least with respect to impure, imperfect intellectual beings. Imperfect intellectual beings strive for perfection within certain limits; i.e. they imitate the perfect intellect to a certain degree. However, the claim that everything loves and imitates the first mover sounds rather mysterious. How can the prime mover be the final cause for non-intellectual beings as well?

\(^{49}\) Cf. *Metaph.* Α 6, 1071 b f.

\(^{50}\) *Metaph.* Α 7, 1072 a f.
At many places within his *Metaphysics*, Aristotle suggests that the four forms of causality can be predicated analogously in many ways. This is certainly true with respect to final causes. Something like this has already emerged above in the comparison of self-movers with the natural movements of inanimate substances. Final causes apply to both, albeit in different ways since it is impossible to ascribe desire and striving to inanimate substances in non-metaphorical ways. In spite of this, there is a certain similarity between the two kinds of motions that makes analogous predication possible: directed movements are ordered and measurable; hence it is possible to tell regular from irregular processes. This in turn allows us to say that directed natural movements proceed as if they were governed by an intellect. Note that this is not a metaphor. Rather, both kinds of motion have certain forms, follow a certain order and are governed by certain laws. This makes the ascription of final causality possible in both cases.

Now, the celestial bodies, which enjoy at least substantial actuality in spite of the fact that they are subject to locomotion and therefore to accidental change, come closer to God’s pure, inalterable actuality than any other kind of substance in Aristotle’s view, because their motions are perfectly regular, immaculate and imperishable. Since Aristotle regards them as inanimate he infers that their movements are caused by celestial movers whom he calls gods and of whom he assumes that they imitate the prime mover as well as they can, i.e. very well. With regard to animals, it seems plausible to ascribe to them both desire and perception as a certain analogue of reason, which explains that animals imitate the Divine intellect with their movements as well as possible, i.e. sufficient for the preservation of the species. Plants at least grow and procreate and thus preserve their species in their own ways. And inanimate substances fit into the overall picture insofar as their being formed and being moved in orderly ways conforms to the overall order of the cosmos.

In a famous passage of *Metaphysics* Λ, Aristotle compares the cosmos as a whole with an ordered army. He says that the order of a well-ordered army exists twice, one time in the mind of the general in command and one time on the battleground. However, the order in the general’s mind not only is more perfect than the order on the battleground but also causes the latter. This is an allusion to a further possible ground of final causality, i.e. causality by authority. Probably, it is here where Aristotle comes closer to the idea of Divine creation than anywhere else in his work.

5. Conclusion: First cause and creation

Many questions remain. Instead of a conclusion, let me simply list some of them. First, it seems that Aristotle does not really explain the possibility of orderly motion in inanimate matter since he regards matter as ultimately eternal and uncreated.

---

51 This is the guiding idea behind the fifth way to know that God exists; cf. Thomas Aquinas, *Summa Theologiae* I, in Io., *Opera Omnia*, Editio Leonina, vol. IV, Ex Typographia Polyglotta S.C. de Propaganda Fide, Rome 1888, q. 2 a. 3.
Matter is radically opposed to the Divine since it is a principle that is opposed to intellect, soul, form and determination. This leaves open, however, why matter should be susceptible to form in the first place. It seems that Aristotle simply tacitly assumes that matter is always already formed within an eternal cosmos, so that the concept of prime matter rests on an abstraction, if one that is ontologically necessary. This in itself, however, does not explain the ontological relatedness of matter to form. In this respect, a theology of creation which ascribes the creation of prime matter to God as well appears to be more coherent.

Additional questions are raised by Aristotle’s methodology. What precisely is the argumentative force in his reasoning towards a prime mover? It seems clear enough that the arguments are not deductive proofs. But at the same time, the argument is obviously supposed to be more than a merely dialectical argument which simply establishes that a certain claim is more probable than its negation. Aristotle does not say that God’s existence is more probable than His non-existence but that God necessarily exists, given that the cosmos has the salient features that Aristotle highlights. In want of a better term, I would like to call this type of reasoning that Aristotle employs in Physics Θ and Metaphysics Λ speculative induction, being aware of the fact that this concept deserves further explication. Modern rationalists think that arguments of this inductive type are weaker and less compelling than deductive reasoning. I would like to argue to the contrary, however: No formally valid deduction can be stronger than the premises which go into it. And it seems that most of the deductive arguments that we know from the history of natural theology either rest on dubious premises or on inference rules that are at least in part question-begging. This might be an indication that principles for a valid a priori deduction of God’s existence are not available at all. If one adds to this the idea that good philosophy always starts with respect for the facts it seems that there are virtually no promising alternatives to an Aristotelian method, broadly conceived, of approaching philosophical theology.

Finally, I would like to address the critical question whether Aristotle’s theological arguments rest on a completely outdated physics once again. For some parts of the overall argument, this has to be frankly admitted, most notably for the doctrine of the planetary movers. But this is a merely physical hypothesis that does not carry much weight with respect to the overall theological claim. By contrast, the inference towards a prime mover operates on a much higher level of metaphysical abstraction that does not really depend on all the details of Aristotelian physics. Hence, it does not seem that this argument is affected by the changes in the modern understanding of matter, movement and energy at all. Aristotle teaches that the thoroughgoing order of the cosmos and all its parts shows that there must be an intelligible Divine origin. Admittedly, any reference to a transcendent origin and a transcendent mode of causal-

---

55 Cf. WIELAND, Aristotelische Physik, p. 351. In a further paper, Enrico Berti discusses the idea that Aristotle’s metaphysics might survive both the destruction of his physics by modern science and the criticism of metaphysics in general, i.e. as an «idea of metaphysics that has not yet been exploited»; cf. E. BERTI, What remains of Aristotle’s metaphysics today?, in C. BARACCHI (ed.), The Bloomsbury Companion to Aristotle, Bloomsbury, London 2014, p. 327-337, 337. Wolfgang Welsch suggests that even Aristotle’s physics might become attractive again as an alternative to reductive physicalism and materialism; cf. W. WELSCH, Der Philosoph. Die Gedankenwelt des Aristoteles, Fink, München 2012, pp. 170 ff.
ity that cannot be grasped but merely elucidated with the help of analogies is uncanny. Unlike other cases, wonder and amazement do not cease here once we have reached an ultimate explanation. The thought that the universe has a Divine origin is as sublime, amazing and uncanny as the existence of the universe in itself.

Abstract

The paper examines Aristotle’s arguments for an unmoved mover in his Physics and Metaphysics. First, the question is raised whether it is legitimate to address this theological topic within the context of a scientific investigation of nature at all. The question presupposes, however, that physics can do without at least a theological perspective, and Aristotle argues that it cannot. In a second step, Aristotle’s arguments for an unmoved mover are reconstructed. One important result is that Aristotle cannot explain the nature of the first mover and the type of transcendent causality that is involved in a physical context because these questions are genuinely metaphysical. Therefore, the third step leads to Metaphysics Α where both questions are answered. The paper closes with three points for further discussion: (1) Is Aristotle’s metaphysical conception of matter really sufficient? (2) Does his metaphysical theology rest on an entirely outdated physics? (3) What is the method that Aristotle employs in theological reasoning, and especially, how do his inferences towards the existence of a divine intellect work?

Keywords: Aristotle, causation, induction, physics and metaphysics, philosophical theology