

Aristotle and the Thesis of Mereological Potentialism

Christian Pfeiffer (LMU Munich)*

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Abstract

According to Aristotle, the way in which the parts of a whole are is different from the way in which the whole exists. Parts of an object are only potentially, whereas the whole exists actually. Although commentators agree that Aristotle held this doctrine, little effort has been made to spell out precisely what it could mean to say that the parts are only potentially. In this paper, I shall attempt to elucidate that claim and explain the philosophical motivation behind it. I will argue that the motivation of mereological potentialism is to account for the unity of material substance. For a part to be potentially is, I will argue, a form of ontological dependence of the part on the whole. Potential parts have their being as a possible division of the whole. I will further explain this by specifying how the parts are grounded in the capacities of the whole and how the parts are individuated by the whole.

1 Introduction

Extended material objects have parts. A statue of Socrates has parts, e.g., its left arm. A line has its two halves as parts. This is innocuous - for Aristotle as well as for us.¹ Here is the same point, but this time it may sound more controversial: There are the two halves and, as a third thing, there is the whole line. The latter sentence is a logical consequence of the former (at least under a natural understanding of them). Why, then, should it be more controversial? The reason is that I used the term 'to be' in an unclear way. For Aristotle, one might say, there is a difference between being actually and being potentially. Aristotle argues that the way in which the parts are is different from the way in which the whole is. Parts of an object are only potentially (*δυνάμει*), whereas the whole is actually (*ἐνεργείᾳ*). Thus, the way I put things is

*Lehrstuhl für Philosophie III Ludwig-Maximilians-Universität München Geschwister-Scholl-Platz 1 80539 München. email: pfeiffer@lrz.uni-muenchen.de

¹Although it is not uncontroversial to count lines among material objects. I will comment on the notion of matter employed here in due course.

misleading or, even worse, it is wrong. It results from a failure to properly distinguish between being potentially and being actually.

Aristotle's standard examples to mark that difference are the way in which the herm is in the wood and the half-line in the whole line. Here is one instance:

Again, 'being' and 'that which is', in these cases we have mentioned, sometimes mean being potentially, and sometimes being actually. For we say both of that which sees potentially and of that which sees actually, that it is seeing, and both of that which can use knowledge and of that which is using it, that it knows, and both of that to which rest is already present and of that which can rest, that it rests. And similarly in the case of substances we say the Hermes is in the stone, and the half of the line is in the line. (*Meta.* V.7 1017a35-b8)²

The herm is potentially in the stone and the half-line is potentially in the whole line. The wood and the whole line are actually, but their parts are potentially. In the light of this passage and many others, it is, as I will show, plausible to assume that Aristotle believed that the parts of an object are only potentially.³

However, even if we agree that Aristotle believed that the parts are potentially, this does not answer the question what this view amounts to. What does it mean to say that a part is potentially?⁴ Is it wrong to answer the question 'why are X and Y parts of a continuous whole?' with the remark 'It is because X and Y are connected by a boundary'? If we believe the report by Olympiodorus, some ancient commentators have thought so.⁵ They believed that this answer does away with the continuous, which cannot have any boundaries. Olympiodorus' own answer is: 'It is because the potential X and the potential Y are connected by a potential boundary'. But isn't that mere gibberish? What can it mean to say that potential parts are connected by potential boundaries? Moreover, does it imply that a continuous object has no parts whatsoever?

The root of these difficulties is, I believe, that there is a tension between the assertion that the parts of an object are only potentially and the fact that we refer to these parts using pronouns. This is a tension that pervades our notion of parthood even today.

Always in the background of our part-whole thinking is thus a deep tension. We want to talk about parts in the same way in which we talk about whole objects. We want to quantify over parts, compare them, describe them explicitly or implicitly. (Well before the cut we

²All translations are, unless otherwise noted, from Barnes 1984. Sometimes I have slightly modified the translations.

³According to Aristotle, not only the proper parts of an object, but also its internal boundaries, e.g. the points on a line, are potentially. For the purposes of this paper I will restrict my analysis to the parts of an object, but what I say about the parts does apply *mutatis mutandis* to other constituents like the points of a line.

⁴For this complaint see Charlton 2003, 133, who believes that to speak of being potentially is deeply misguided.

⁵Cf. Olymp. *in Cat.* 85.33-86.13. The passage is quoted and discussed in Furley 1982, 19.

can say that the north half of the board is as big as the south half; that it lies above it; that it is rectangular.) However, in many cases we also want to make sure we are talking about things that are purely potential—parts that are not individuated except by reference to the wholes to which they are attached. (Casati and Varzi 1999, 101)

Commentators of Aristotle might agree that this tension is found in Aristotle, too. But little effort has been made to spell out precisely what it could mean to say that the parts are only potentially. In this paper, I shall attempt to elucidate that claim and explain the philosophical motivation behind it. In particular, I believe that Aristotle not only consciously adopted the doctrine of mereological potentialism, but gives a philosophically appealing account of it; an account which is not only of historical interest. Given that modern-day philosophers still feel the same tension pervading our notion of parthood, understanding Aristotle’s account of mereological potentialism might help to clarify problems that are still with us today.

The outline of my paper is as follows. First, I will explain what the thesis of mereological potentialism is and discuss the motivation for it (section 2). I will argue that we have indeed good reasons to attribute this doctrine to Aristotle (sections 2.1 and 2.2) . On this basis, I will argue that Aristotle’s chief motivation for adopting mereological potentialism is to account for the unity of a material (extended) whole and its undetached material parts (section 2.3). This will enable a precise understanding of what is involved in the doctrine of mereological potentialism (section 2.4). In the rest of the paper (section 3), I will give an analysis of what it is for a part to be potentially. I will argue that it is a form of ontological dependence of the part on the whole. In section 3.1, I will argue that for a part to be potentially is to be undetached from the whole. This, in turn, implies that the part is not ontologically separate. In section 3.2, I will further explain this by specifying how the existence of the parts is grounded in the capacities of the whole and how the parts are individuated by the whole.

2 What is mereological potentialism?

Mereological potentialism, as I understand it, is the claim that the parts of a whole are potentially or have being in potentiality. The way of being of the parts is different from the way of being of the whole. The whole is in actuality, whereas the parts are potentially. This is not as trivial, as it may sound initially.⁶ For it is stylistically, and maybe even grammatically, better

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I chose to translate ‘δυνάμει’ as ‘potentially’ and ‘ἐνεργείᾳ’ as ‘actually’. With that usage I largely follow the traditional translation of these terms. It is, I assume, a natural way to translate the dative phrase.

Recently, Beere 2009, 158 has argued that the traditional view must be rejected since it makes ἐνεργεία ambiguous. That is, according to the traditional view ἐνεργεία means in some cases ‘activity’ whereas in others it means ‘actuality’. The ἐνεργεία of a knower is an activity, namely his knowing a certain theorem, whereas the ἐνεργεία of the infinite seems to be an actuality, namely the existence of something actually infinite. I cannot enter this debate

to say that ‘the parts *exist* potentially’ instead of ‘the parts *are* potentially’. Yet, my choice is quite deliberate because a way of being is not necessarily a way of *existence*. For a part to be potentially is not necessarily for it to *exist* potentially. For a part to be potentially is, as I will argue, to be undetached from the whole and to be ontologically dependent on the whole. But, plausibly, ontological dependence is, for Aristotle, not merely *existential* dependence. Rather, as has been urged by various commentators, ontological dependence involves the claim that the being of the dependent item is derived from the whole.⁷ Of course, this requires an argument, but it yields sufficient reason to not simply assume that ‘to be potentially’ just *means* ‘to exist potentially’.

2.1 Evidence for mereological potentialism in Aristotle

In this section, I will begin by addressing the question whether we have good evidence for mereological potentialism in Aristotle. Certainly, he never wrote a continuous treatment on this topic. Nevertheless, by collecting the evidence I think we can see that there is a robust and non-trivial version of mereological potentialism in Aristotle. I will proceed in two steps: I will first collect some passages where Aristotle apparently mentions this doctrine. On the basis of this, I will argue that these passages indeed support my ascription of mereological potentialism to Aristotle. In a second step, I will argue in section 2.3 that mereological potentialism is also systematically important for Aristotle’s philosophy because it plays a major role in the account of the unity of substances.

here, but will restrict myself to the following defence of my translation. Beere develops his interpretation mainly with recourse to the activity cases (he says that ‘the last example, that of the knower, is a touchstone for the notion of *energeia*. (...) there is reason to think that the notion of *energeia* was originally introduced in order to make a point about the sense in which knowing is the highest human good’ (Beere 2009, 175)) and accordingly tailors his discussion of the actuality cases to his interpretation of the activity cases. Insofar as one aims towards an overall interpretation this is perfectly good procedure, but since the cases I am discussing here are the paradigmatic instances of the actuality reading, a translation of ‘ἐνέργεια’ as ‘activity’ is not helpful *without the complete picture*. Even Beere acknowledges that sometimes ‘actuality’ may be the best translation for some cases (pp. 202). For example, in the phrase ‘that which is a herm in *energeia* is not, as such changing’ one cannot substitute ‘*energeia*’ with ‘activity’.

Menn 1994; Anagnostopoulos 2011 who share the view of Beere that ἐνέργεια means ‘activity’ acknowledge, too, that there are derivative instances where ‘actuality’ is the correct translation.

The question remains whether ‘δυνάμει’ should be translated as ‘potentially’. Again, this is an intricate issue, but let me state the following. According to the traditional interpretation, which is represented by Frede 1994; Witt 2003; Makin 2006, there are two *senses* of δύνάμις. One sense is ‘capacity’ - what something has - and the other is ‘potentiality’ - a mode of being. Anagnostopoulos 2011 on the other hand argues that Aristotle does not recognise a distinct sense of *dunamis* that is a mode of being. Rather there is only one sense, namely, capacity. However, when it comes to the dative phrase δυνάμει – which is the sense that interest us most – it is natural to translate as ‘potentially’. ‘Potentially’ is, I believe, an anaemic term that does not necessarily imply that there is a distinction between a capacity for becoming and a capacity for being. If I say that the herm is potentially in the wood, I do not take a stance on the debate whether the herm has a certain capacity for becoming or whether he has the distinct capacity to be.

⁷The traditional interpretation of ontological dependence as existential dependence goes back to Fine 1984. Against this view, see Corkum 2008 and Peramatzis 2011, ch. 8-10.

The philosophical background of mereological potentialism. Although the doctrine is mentioned at various places, I will rely mainly on passages from the *Metaphysics*.⁸ From these passages it is evident that for Aristotle's the thesis of mereological potentialism is one instance of a wider and more general account of ways of being. Besides *Metaph.* V.7 1017b6-9 — quoted on p.2 — the following passage is especially important:

Actuality means the being of the thing, not in the way which we express by 'potentially'; we say that potentially, for instance, a statue of Hermes is in the block of wood and the half-line is in the whole, because it might be separated out, and even the man who is not studying we call a man of science, if he is capable of studying. Otherwise, actually. Our meaning can be seen in the particular cases by induction, and we must not seek a definition of everything but be content to grasp the analogy,—that as that which is building is to that which is capable of building, so is the waking to the sleeping, and that which is seeing to that which has its eyes shut but has sight, and that which is shaped out of the matter to the matter, and that which has been wrought to the unwrought. (*Metaph.* IX.6 1048a30-b4)

According to Aristotle, there are two ways of being — being in actuality and being in potentiality.⁹ Something can be, e.g., a house in two ways. It can be a house in potentiality or it can be a house in actuality. Some bricks and stones, insofar as they can be turned into a house, are potentially a house. Insofar as they have been turned into a house, they are a house in actuality. Similarly, the herm is potentially in the wood, insofar as it can be separated out. I take it that the example of the herm and the half-line are representative for all sorts of parts which are contained in a whole. I will support this claim in detail below, but let me now highlight the fact that thesis of mereological potentialism is part of an overarching metaphysical theory of being in actuality and being in potentiality. As Aristotle states in this passage, the distinction between being in actuality and being in potentiality applies to all sort of items, not only parts and wholes. Yet, it is equally important that this does not imply that we should seek a general definition of actuality and potentiality. On the contrary, Aristotle explicitly denies that there is such a general definition. Rather, the general application 'can be seen in the particular cases by induction, and we must not seek a definition of everything but be content to grasp the analogy' (*Metaph.* IX.6 1048a35-37). That means that, although the thesis of mereological potentialism is part of a more general metaphysical framework, it can be studied prior to and relatively independent of the general framework. After we have understood the doctrine of mereological potentialism and how it is justified, we can compare it to other cases, such as the builder or the who is capable of seeing.¹⁰

⁸Passages outside the *Metaphysics* include, e.g., *Ph.* VIII.8 263a23-263b9 and *De An.* III.6 430b6-20.

⁹For a detailed analysis of this passage in the context of *Metaphysics* IX see Beere 2009.

¹⁰For a discussion of this methodology and this passage see Beere 2009; Makin 2006. Commentators have in their discussion of potentiality and actuality mainly focused on the examples of the house-builder or the the one

Is it really a claim about parts? Mereological potentialism is, I argued, part of a broader philosophical analysis of actuality and potentiality — an analysis Aristotle was the first to have carried out. One might, however, agree that Aristotle envisaged such a large project, but still question whether we find mereological potentialism in Aristotle. Does Aristotle really make claims about the potentiality of *parts*? Consider the herm in the wood. What is it that is potentially or in capacity? There are two answers: The first answer supposes that it is *the herm* which is potentially. When Aristotle says that the herm is potentially in the wood, he is maintaining that there is a herm and that *this* herm is potentially. The herm has the capacity to be carved out of the wood. The thing being potentially is the part.

The second view holds that it is not the herm that is potentially or in capacity, but rather the wooden block. When Aristotle says that the herm is potentially in the wood, he only asserts that the wooden block has the capacity to be made into a herm. On this reading it is not the herm that is potentially, but the wooden block. The thing being potentially is the whole. Clearly, these two views are not incompatible. One could hold both that the herm is in capacity and that the wood has the capacity to be made into a herm. Indeed, in section 3.2.1 I will argue that this is the case and the potentiality of the parts is grounded in the potentialities of the whole. But nonetheless these are distinct views.¹¹ We find a robust version of mereological potentialism only on the first view.

I think there are good reasons to ascribe this view to Aristotle. In *Metaphysics* III he remarks that ‘the herm is not in the stone, neither is the half-cube in the cube as something separate’ (*Metaph.* III.5 1002a21-23). The subjects of the claim are the half-line and the herm. Aristotle refers to the objects that are the parts. Accordingly, when he says that ‘we say that potentially, for instance, a herm is in the block of wood and the half-line is in the whole, because it might be separated out (ὅτι ἀφαιρεθείη ἅν)’ (*Metaph.* IX.6 1048a30-33), he means that *the* half line or *the* herm might be taken away.¹² Again, the subjects of the claim (the referent of ‘it’) are the

who sees or knows. The way in which the half-line is potentially in the line is seldom discussed in any length. The best discussion is in my opinion found in Charlton 2003. The remarks by Coope 2005, 9-13 are also of admirable clarity. Nevertheless, I believe that a clear understanding of this special case of the potentiality and actuality distinction may shed some light on the more general discussion about these concepts.

¹¹Beere 2009 does not always distinguish clearly between these two views. Sometimes he adopts the first reading, sometimes the second. To give two examples: On page 203 he writes: ‘the herm was already around - already had being - before its producer started separating it out from a block of wood. At that stage, it had merely being-in-capacity, but it has being’ and on page 201: ‘In that case [i.e. the production of a herm /my addition] the matter, a block of wood, is a herm in capacity.’

¹²Beere takes the explanatory phrase ‘because it might be separated out’ only with the example of the line. He argues that ‘if we took the phrase with both, then Aristotle would, strangely, be speaking of removing the *herm*, rather than the wood around it’ (Beere 2009, 172 Fn. 8). I have to say that I do not share this intuition. Of course, in producing a herm you have to remove the wood around it. But I cannot see why one could not say that a herm has been taken away from the wood. Indeed, in one passage Aristotle does precisely that when he says that ‘things which come to be without qualification, come to be in different ways: by change of shape, as a statue; by addition, as things which grow; by taking away, as the Hermes from the stone; by putting together, as a house; by alteration, as things which turn in respect of their matter’ (*Ph.* I.7 190b5-9).

herm and the half-line. In these passages, ‘being potentially’ refers to the parts.

In other passages Aristotle is even more explicit:

The continuous and limited is a whole, when there is a unity of a certain kind consisting of several parts present in it, especially if they are only potentially, but, failing this, even if they are present actually. (*Metaph.* V.26 1023b32-34)

Evidently even of the things that are thought to be substances, most are only potentialities, e.g. the parts of animals (for none of them is separately (κεχωρισμένον); and when they are separated, then they too exist, all of them, merely as matter). (...) One might suppose especially that the parts of living things and the corresponding parts of the soul are both, i.e. both actually and potentially, because they have sources of movement in something in their joints; for which reason some animals live when divided. Yet all the parts must be only potentially, when they are one and continuous by nature,—not by force or even by growing together, for such a phenomenon is an abnormality. (*Metaph.* VII.16 1040b5-16)¹³

Especially the first passage is (together with *Metaph.* VII.13 1039a3-10) important for understanding Aristotle’s reason for holding mereological potentialism. But they also make clear that the parts are modified by ‘being potentially’. In these passages, Aristotle claims that a whole can be a unity only if its parts are present potentially and the parts of wholes are potentialities because they are not separate. Clearly, then, there is a version of mereological potentialism present. The parts of a whole are potentially. This, however, is not yet an interpretation or even elucidation of Aristotle’s doctrine. All I have shown so far that Aristotle indeed has a version of mereological potentialism, but not how this version should be understood. This is the task of the next sections.

2.2 Two conceptual clarifications

Since part of the difficulties in discussing the thesis of mereological potentialism in the case of Aristotle stems from the various conceptual pitfalls, it is, I believe, useful to begin with some more general methodological remarks. The ultimate aim of this interpretation (as of any other, I suppose) is to understand Aristotle’s theory as we find it in his writings. Whether or not he had a theory resembling the doctrine of a modern-day philosopher is only of secondary interest. However, in order to understand Aristotle it is necessary to translate what he says into a terminology we understand. It is, for instance, not an interpretation of Aristotle to maintain

¹³This translation is by Ross 1924, who is followed by Frede and Patzig 1988a. Bostock 1994 translates: ‘Since none of them exists when separated.’ This, however, gets things wrong because Aristotle continues ‘and when they are separated, then they too exist, all of them, merely as matter’. This would be an awkward repetition or even contradiction. Aristotle’s point is that a part of an animal, e.g. a hand, is not ontologically independent as long as it is not separate. And even when it is separated, it does not exist *as* a hand. I discuss this passage in detail below.

that the herm is potentially in the wood. This is a repetition of what Aristotle says. A sound methodology requires that when we want to report what Aristotle thought, we must find a way to express his thoughts in our words. This is, I believe, a perfectly general truth and not a specific problem about how to understand *ancient* philosophy. This methodology is nicely expounded by David Lewis:

Sometimes it is wrong to take a philosopher at his word when he tells us what he believes to exist. For if we differ with the philosopher on some point of semantics, then we must make allowance for that difference if we want to report his position in our words, in indirect quotation. [...] The lesson is that whether 'we' may take a philosopher at his word depends on who 'we' are and what philosophical premisses we ourselves argue from. (Lewis 1990, 23-24)

To agree or disagree with any philosopher requires an understanding of our own language and terms. Acquiring such an understanding is, of course, no trivial task. I cannot solve or even adequately discuss these problems here. However, in discussing the doctrine of mereological potentialism in Aristotle a general and encompassing discussion might not be needed. If we combine an awareness of the problem with some terminological stipulations and some reflections on how our use of the words relates to Aristotle's, we will be able, I hope, to steer clear of the pitfalls of terminological riddles.

2.2.1 To be potentially is to be

The doctrine of mereological potentialism, as I understand it, is concerned with the being of the parts. Claims, such as that the herm is potentially in the wood or, as Aristotle says in *Metaphysics* V.26, the parts are potentially present in the whole, are claims about the being of these parts. Aristotle's notion of potentiality does not apply primarily to states of affairs, such as the state of affairs of Hermes being in a stone. Rather, as I have argued in the last section, all passages suggest that the potentiality pertains to the parts.

As is well known, Aristotle has a highly sophisticated and complex notion of being. Not only is there a different sense of being associated with each of the ten categories, but, as I said above, being comes in two ways, so to speak. Some things are potentially and others actually. I shall say more about Aristotle's doctrine below, but it is important that the doctrine of mereological potentialism does not imply that the parts do not exist. If we were to say that a line has no parts, we would say that a line is a point. A point has no parts. It is a part-less item. A line has parts. It is defined by having connected parts. It is a contradiction to say that there are parts which a line has and then go on to deny that these parts are there.¹⁴

¹⁴I think a similar mistake is made by Furley 1982, 18-19 who claims that a continuous object has no internal boundaries at all. If the object had no boundary at which it is connected, it would not be continuous.

If this is right, it should be possible to say that both the parts and the whole are, albeit not in the same way.

Again, ‘being’ and ‘that which is’, in these cases we have mentioned, sometimes mean being potentially, and sometimes being actually. [...] And similarly in the case of substances we say the Hermes is in the stone, and the half of the line is in the line. (*Metaph.* V.7 1017a35-b8)

As this quote makes clear, it is wrong to say that only actual things are or that some things do not exist, but are only potentially. According to Aristotle, we should not say ‘This thing is a F, but that thing is only potentially a F’ because it might be taken to imply that the second thing is not an F. Rather we should say: ‘Both things are Fs, but this is actually a F and that is potentially a F.’¹⁵ And the same is true of being: All things are - some potentially, some actually. Accordingly, the doctrine of mereological potentialism does not concern the existence or non-existence of some items, but their specific way or mode of being. We do not ask ‘Do the parts of objects exist?’, but rather ‘In what way are the parts of objects?’ or ‘What is it for a part to be potentially?’.

If I have correctly identified the question, we should expect as an answer an account of the metaphysical structure of parts and wholes. For some metaphysicians this comes as no surprise. Jonathan Schaffer, e.g., takes such an approach to metaphysics as distinctively Aristotelian.¹⁶ According to Schaffer, an Aristotelian metaphysics differs from the Quinean approach insofar as its concern are not questions of existence, but rather questions of grounding and fundamentality. In this vein, we do not ask, e.g., whether properties exist, but rather *in virtue of* what properties exist. This notion of a metaphysical ground, then, captures ‘a particular sort of non-causal priority’ (Correia and Schnieder 2012a, 1). It centres around the idea that a fact p obtains *in virtue of* or *because of* a fact q.¹⁷ Here is not the place to review a theory of grounding, neither its prospect in metaphysics as a whole nor its general application in the case of Aristotle. But I believe that it helps to get our question right which should be the following: What is it for a part to be potentially and, given that the potential being of parts is not fundamental, what grounds their being?

Put in this form, we can see why it is not helpful at all to say that ‘Wholes do not have parts’ or ‘the parts of wholes do not exist’.¹⁸ Either it is false or it is vastly underspecified. Either it

¹⁵Cf. Frede and Patzig 1988b, 51

¹⁶Cf. Schaffer 2009. Koslicki 2008 presents an account of mereology and the structure of objects which is inspired by Aristotle, too. In her book she discusses the notions of whole and part which are presented mainly in Aristotle’s *Metaphysics* V (cf. Koslicki 2008, 122-164).

¹⁷For an account of grounding see Correia and Schnieder 2012a; Rosen 2010; Schaffer 2009. A good overview over the debate is the collection of papers in Correia and Schnieder 2012b.

¹⁸Compare the following remark by Scaltsas: ‘A substance has no parts, that is items that can be individuated independently of the whole. [...] Separation gives birth to an entity that did not exist in the whole. [...] A substance

means that all objects are units or points, which is false. Or it means that parts do not exist in the same way as the whole. But then we are really interested in the specific way of *being* of the parts, rather than their mere existence.

2.2.2 A remark on the logic of part and potentiality

There is an additional difficulty in the way the logic of ‘part’ connects with the logic of ‘potentially’ and ‘actually’ and the logic of ‘detachment’. This has to do with the fact that it might seem that parts are always actually parts. This is to say that when we refer to something as a ‘part’, we are usually implying that it is actually a part of a whole. Consider my hands. They are parts of me. It commands Moorean certainty, as we may say, that I have two hands. ‘Actually!’, one wants to protest. I do not have hands only potentially.

Yet, when I say that parts are potentially, I do not say that the objects in question are potentially parts. ‘Potentially’ does not modify ‘part’, but the being of the thing that is a part. The doctrine of mereological potentialism does not imply that I have hands only potentially (what would that mean?), but that my hands are potentially. If we were to use square brackets [...] to indicate the scope of potentially and actually, we could put it down as: If the whole [is actually], the parts [are potentially]. Or if a human [is actually], her hands [are potentially]. But this is compatible with the assertion that a human has [parts in actuality]. A human, if she [is actually], has [parts in actuality], but the parts [are potentially]. It is compatible because in one case actually/potentially modify the being of the objects in question. In the other case actually/potentially modifies part. This is the distinct question whether something is a part of another object or not. If I say that bricks are [potentially parts] of a house, I imply that the house is not yet built and the bricks can become parts. But if I say that the bricks – which are [potentially parts] of a house – [are actually], I say that the bricks enjoy the status of ontologically independent items.

In the doctrine of mereological potentialism the modifiers ‘potentially’ and ‘actually’ apply to the being of items. It is a doctrine that says the parts [are potentially] if the whole [is actually]. It says nothing about things that are [potentially parts] or [actually parts]. To avoid confusion I shall always modify the *being* of the item in question with the adverbs ‘actually’ and ‘potentially’. That this must be right can, to anticipate some conclusions, be seen from

does not consist of (distinct, independently identifiable) parts’ (Scaltsas 1994, 188). Cf. also Bostock 2006a, 104: ‘For they could say that so long as the whole is all together, and the various parts are not separated, then only the whole exists and the parts do not. We normally think of the parts as existing because they exist potentially, which is to say that they could be separated, and so could exist. (This is Aristotle’s own doctrine).’ I think that both Scaltsas and Bostock make an important observation. First, the parts are not individuated independently of the whole. Second, the fact that the parts could be separated is a ground for attributing potential existence to them. Both these facts will play an essential role in my analysis. But I think that it is wrong to conclude that the parts do not exist, if this claim is not further qualified. To the contrary, I think it is a reason to conclude that the parts *do* exist albeit not in the same way as the whole.

Aristotle's remarks in *Metaphysics* VII.16.

Evidently even of the things that are thought to be substances, most are only potentialities, e.g. the parts of animals (for none of them is separately; and when they are separated, then they too exist, all of them, merely as matter. (*Metaph.* VII.16 1040b5-8)

Aristotle does not argue that humans only potentially have hands. This would be absurd. Instead he is arguing that the ontological status, the being of hands is being potentially. Since being a substance implies being separate and being actually, parts of animals are not substances because they are not separate. So the doctrine of mereological potentialism says the following with respect to my hands: I have two hands, but these hands do not have the same ontological status as me. I am actual and exist separately, but my hands are potentially and do not exist separately. But, of course, I actually have two hands.

This passage points to another important issue that must be kept in mind. Whether something is actually or potentially depends on whether it is separate or not. This is one reason why undetached parts exist potentially. As long as the parts are not separate, they are potentially. If the parts are separated, they are actually. However, this does not tell us *what* the part is before and after it is separated. This is the reason why Aristotle adds that the parts of animals, once they are separated, exist merely as matter. Before *this* part of the animal was severed, it was a hand. But after it has been severed, it is no longer a hand. It is merely some matter, a lump of flesh and bones or whatever dead tissue is. I will come back to this point in section 2.4.2.

To sum up: To say that parts of an object are potentially, is not to deny that they exist. Nor does it amount to saying that an object has only potentially parts — as if it had its parts in a secondary way. Parts do exist and objects have parts in a straightforward and unproblematic way. The thesis of mereological potentialism concerns a way of being of the parts of a whole. To say that the whole is actually, whereas its parts are potentially is to deny the parts a certain ontological status. In section 3 I will spell out in detail what this amounts to. Before that I will turn to the motivation and a general characterisation of the thesis of mereological potentialism (section 2.3 and section 2.4).

2.3 The motivation for mereological potentialism

The best way of approaching the doctrine of mereological potentialism in Aristotle is to ask what the motivation for this doctrine is. Once we know what the theory is supposed to explain, we are better equipped to understand its content. Why, then, should one suppose that the actuality of the whole and the actuality of its parts are mutually exclusive? What reason did Aristotle have for holding such a view?

The main motivation behind the doctrine of mereological potentialism is to account for the unity of an object having parts. It seeks to answer the question how something that has parts

can yet be a single object and a unity. More specifically, for Aristotle it is a doctrine about the unity of material substances. That is to say, mereological potentialism is primarily a doctrine by which we explain the unity of continuous and extended wholes which can be considered as substances. For example, in his entry on ‘whole’ in *Metaphysics* V.26 Aristotle remarks:

The continuous and limited is a whole, when there is a unity of a certain kind consisting of several parts present in it, especially if they are present only potentially, but, failing this, even if they are present actually. (*Metaph.* V.26 1023b32-34)

Something continuous is a whole if it is a unity of a certain kind. A whole comes to be from ($\acute{\epsilon}\chi$)¹⁹ its parts. The whole consist of the sum of the parts (without necessarily being identical to the sum). Crucially, however, X’s being a whole correlates with the ontological status of the parts of X. X is a whole, Aristotle says, especially if its parts are only potentially. If the parts of X are actually, it cannot be a whole to the highest degree.²⁰

Aristotle relies in his argument on the thought that a substance cannot be composed of substances.

Again, it is clear in this way too. Substance can not consist of substances actually present in it; for that which is actually two can never be actually one, whereas if it is potentially two it can be one. E.g., the double consists of two halves—that is, potentially; for the actualisation separates the halves. Thus if substance is one, it cannot consist of substances present in it even in this sense, as Democritus rightly observes; he says that it is impossible for two to come from one, or one from two. (*Metaph.* VII.13 1039a3-10)

From the terminology it becomes obvious that this passage and the passage in *Metaphysics* V.26 are parallel cases. In both cases Aristotle uses the term ‘being present in’ together with the modifier ‘actually’ and ‘potentially’. Aristotle justifies his claim that a substance cannot consist of substances with an appeal to the fact that the actuality of the parts and the whole are mutually exclusive. Since substances are paradigmatic wholes, their parts must be potentially.

¹⁹Aristotle discusses the various senses of ‘from’ and the way in which the whole is from its parts or the parts from the whole in *Metaph.* V.24 1023a26-b11.

²⁰One has to be aware that Aristotle allows for a gradation. There are wholes whose parts are actually . We may suppose that the legs of a table are parts that exist actually. A table is not a proper unity. And it may be up to us how we should regard this case. Nonetheless it is clear that a high degree of unification of a given whole implies that the parts are potentially. I shall largely ignore gradation. Nevertheless, it is important to keep in mind that Aristotle allows for gradation. It is important because the examples with which one elucidates something are often not the best instances of what is elucidated. It is common to elucidate the notion of substance and matter and form with the example of a statue. But from that it does not follow that a statue is the best example of a substance or a matter-form composite. Similarly, I will not make a distinction between the herm which is part of a piece of wood and the legs of the table that are part the table. The doctrine of mereological potentialism can be elucidated with both examples alike and, if the doctrine applied to them, it would do so in the same way. However, this is compatible with the assumption that, once we grasp the doctrine, we see that the cases are not really the same and that the table-legs are probably actually present in the whole table. I will say more on this in section 2.4.1. For an account of Aristotle’s mereology see Koslicki 2008, ch.6.

Aristotle illustrates this with the example of the double. The double has two halves, but the halves are only potentially. If the halves were actually, the double would no longer be. Aristotle thus modifies Democritus' principle according to which two cannot be one and one cannot be two by adding 'actually' and 'potentially'. No two actually existing things can be one thing in actuality. Nor can one thing in actuality be two things in actuality. We can summarise Aristotle's position as follows:

Wholes and Parts. *For a whole to be actually one unified whole, its parts must be potentially. If the parts are actually, the whole is no longer one unified whole in actuality.*

This is one of the main tenets of mereological potentialism. A whole is a single unified object and cannot consist of parts that are actual (setting aside the possibility of gradation). The parts of a whole are not themselves actually, but *parts* of a single and unified object that has being in actuality. In this sense, Aristotle believes that an account of the unity of a given whole includes the doctrine of mereological potentialism. The two passages from the *Metaphysics*, quoted in this section, also corroborate the claims I made in section 2.2. It is clear that there is a sense in which a line *has* parts. A line, e.g., is not an atom. It has parts, although these parts are potentially.

2.4 The doctrine of mereological potentialism in Aristotle

2.4.1 The range of the claim

There is another important piece of information contained in the two quotations I cited in section 2.3. It concerns the scope of the doctrine of mereological potentialism. Aristotle applies the doctrine of mereological potentialism *primarily* to material substances, understood as extended, continuous objects and their extended, continuous parts.²¹ This immediately excludes properties and their parts, if they have any, or nations and their parts, or sets or, more generally, abstract objects. The doctrine of mereological potentialism, as Aristotle understands it, tells us nothing about these types of objects.²² Still, the class of items that fall under the scope of mereological potentialism seems somewhat gerrymandered. Lines, humans, statues — they all fall under it. They are all material substances — in the widest sense of the term.²³ But even

²¹Although Aristotle never explicitly restricts the doctrine to them, a survey of the examples corroborates this claim. The examples include, but are not restricted to *Metaph.* V.7 1017b6-9, *Metaph.* III.5 1002a20-25, *Metaph.* IX.6 1048a30-33, *Metaph.* VII.13 1039a3-10, *Metaph.* IX.9, 1051a21-33, *Metaph.* VII.16 1040b5-16, *Ph.* VIII.8, 263a23-263b9, *de An.* III.6 430b6-20. For more on 'primarily' see my remarks on Philoponus below.

²²In this Aristotle differs from modern proponents like Smith who use the doctrine unrestrictedly. See Smith 1994, 79. As we will see in section 2.4.4, Aristotle has good reasons for this restriction.

²³The scope of the doctrine encompasses both physical and mathematical entities. It may sound problematic to call a line a material substance, but "matter" in this context does not only encompass *physical* matter, but also *intelligible* matter. According to Aristotle, geometrical objects are particulars which possess matter that can be

though Aristotle applies the doctrine to the parts of lines or the herm in the wood, his ultimate interest is, I suggest, an analysis of material substances in a more refined sense. A line or a herm are good examples because they have features that elucidate the doctrine of mereological potentialism. But this is consistent with the assumption that the most important application of the doctrine are genuine substances.

I believe that the notion of a material substance — understood in contrast to non-material and abstract objects— is intuitively clear, but we can make it a bit more precise by focusing on the notion of part which is central to mereological potentialism. The key notion which explains parthood is that of detachability. That is to say, the notion of part is tied to and explained by the twin concepts of taking away and division. This is suggested both by an survey of examples as well as by the way in which the parts become actual. For Aristotle repeatedly explains the actualisation of a part with an appeal to the notion of division, separation or taking away. Besides the already quoted passage from *Metaphysics* VII.13 an important testimony is found in *Metaphysics* IX, where Aristotle remarks:

Actuality, then, is the existence of a thing not in the way which we express by ‘potentially’; we say that potentially, for instance, the herm is in the block of wood and the half-line is in the whole, because it might be separated out. (*Metaph.* IX.6 1048a30-33)

The undetached parts of a whole are potentially.²⁴ I believe that this notion of part can be best elucidated if one thinks of pieces of matter that can be (either physically or in a mental procedure) chopped off. In this sense, the parts under consideration are what we would call an ‘arbitrary undetached part’.²⁵ Aristotle employs a mereological conception on which the

divided in various ways. Cf. *Metaph.* VII.10 1036a3-13. In this way, it is true to say that both physical and mathematical objects have matter insofar as matter is tied to the concept of an extended and continuous stuff. Both wood, which is the matter of the statue, as well as two-dimensional extension, which is the matter of a line, can be viewed as an extended and continuous stuff. Although there is no difference in terms of the doctrine of mereological potentialism, the way in which the potentially existing parts are actualised is different. In the case of physical objects there has to be a physical process of some sort. For the herm to exist actually, the wood has to be chopped. The parts must be literally separated from the whole. In the case mathematical objects the actualisation of the part depends on the mathematician’s noetic activity. For the half line to become actual, it suffices that the mathematician thinks of the half line as separate. Cf. *Metaph.* IX.9 1051a21-33 and *De An.* III.6 430b6-20. Though I admit that this is a difficult question and the passages can be read differently as well. But I think that everybody should agree that, if there is a division of a mathematical line, the way the division is carried out is very different from the way the division of a physical object takes place. On the difference in what counts as an actualisation see also Coope 2005, 11. How precisely this is supposed to work is a question of Aristotle’s philosophy of mathematics that need not detain us here.

²⁴How separability explains potentiality is the topic of section 3.1.1.

²⁵This, I suggest, corresponds roughly to the first sense of ‘part’ Aristotle mentions in the entry on part in *Metaph.* V.25: ‘We call a part that into which a quantity can in any way be divided; for that which is taken from a quantity qua quantity is always called a part of it’ (*Metaph.* V.25 1023a12-15). A part in this sense is that which can be taken away from a quantity. It is true that this notion of part is especially relevant in mathematics. This is true to an even greater extent of the second part Aristotle mentions: ‘[Part] means, of the parts in the first sense, only those which measure the whole; this is why two, though in one sense it is, in another is not, a part of three’ (*Metaph.* V.25 1023b15-17). For this sense is equivalent to Euclid’s first definition in the fifth

only criterion for parthood is that the part is part of the matter of the object. This is further suggested by the semantics of the verbs ‘to take away (*ἀφαιρεῖν*)’ and ‘to divide (*διαίρειν*)’ on which Aristotle relies in his description of the relevant parts as well as in his explanation why parts are potentially. Both notions should be understood literally: to take a away a part from the whole is to (spatially, physically) remove the part. It is the sense in which a cake is cut into pieces and a table is divided into its parts.²⁶ Therefore, we can characterise a material part as follows:

Material part. *If X is a material object with n-dimensions and X is divisible in n-ways corresponding to the dimensions, then to every division of the object there corresponds a material part of the object.*

This states that (if there is no metaphysical impossibility in the divisions involved) the material parts of an object correspond to the possible division of the object. The thesis of mereological potentialism applies to the material parts of an object.

book: ‘A magnitude is a part of a magnitude, the less of the greater, when it measures the greater.’ And I grant that Aristotle might have had a mathematical theory in mind when he listed this notion of part. It is, however, equally true that this notion of part is not restricted to mathematical entities. It applies to magnitudes in general and thus encompasses physical magnitudes as well. For a comparison to the ‘doctrine of arbitrary undetached parts’ see below.

²⁶Thus, the meaning of ‘taking away (*ἀφαιρεῖν*)’ is very different from mathematical or logical abstraction. The logical sense of *ἀφαίρεσις* is more prominent in Aristotle, but the literal meaning can be found, e.g., in the following two texts:

But neither is it possible to subtract a point from a line. For, if a point can be subtracted, it can also be added. But if anything is added, that to which it was added will be bigger than it was at first, if that which is added be such as to form one whole with it. Hence a line will be bigger than another line by a point. And this is impossible. But though it is not possible to subtract a point as such from a line, one may subtract it incidentally, viz. in so far as a point is contained in the line which one is subtracting from another line. For since, if the whole be subtracted, its beginning and its end are subtracted too; and since the beginning and the end of a line are points: then, if it be possible to subtract a line from a line, it will be possible also thereby to subtract a point. But such a subtraction of a point is accidental. (*De lin.* 927a14-27)

For when something is subtracted from one of two equals and added to the other, the other is in excess by these two; since if what was taken from the one had not been added to the other, the latter would have been in excess by one only. (*EN* V.4 1132a32-b1)

Especially the first quotation is crucial for the meaning of ‘taking away’ that is used in the identification of parts. The author of *De lineis* (if it is not Aristotle) argues that one cannot take away a point, since the semantics of ‘taking away’ implies that what is taken away can also be added. It is, however, a truth that if you add something the resulting whole will be bigger. Since a line cannot be increased by a point, a point cannot be added to a line. Therefore, it can also not taken away, except incidentally by removing a line segment on which the point lies. I do not wish to dwell too much on the argument itself. Rather I want to draw the attention to the way in which the verb ‘taking away’ is used. It is a quite literal sense in which a quantitative part is taken away from a whole. It is a piece of the matter of the object that is taken away from the whole.

The notion of division describes the same process from the opposite direction. Whereas the parts are taken away, it is whole that is divided. A whole is divisible into its parts and parts can be taken away from the whole. Thus the division of a whole and the taking away of parts are two sides of the same coin. Accordingly, I will sometimes use the one and sometimes the other expression depending on whether the perspective is from the parts or from the whole.

A comparison to DAUP

We may fruitfully compare Aristotle's characterisation of the relevant parts to what is nowadays called an arbitrary undetached part:

For every material object M, if R is the region of space occupied by M at time t, and if sub-R is *any* sub-region of R *whatever*, there exists a material object that occupies the region sub-R at t. (Inwagen 2001, 75)

Aristotle does not use regions of space in his formulation, but the underlying idea is, I assume, quite similar. If we frame it in terms of extension, the doctrine says that *any* part of the extension of a material object is the extension of (another) material object. If we accept this as a framework of the discussion it may also help to bring out Aristotle's distinctive thesis. Whereas van Inwagen holds that arbitrary undetached parts do not exist and his opponent believes they do, Aristotle believes that arbitrary undetached parts exist, but are potentially. Aristotle, I suggest, would accept the following:

For every material object M, if R is the region of space occupied by M at time t, and if sub-R is *any* sub-region of R *whatever*, there is potentially a material object that occupies the region sub-R at t.

I think this principle is extensionally correct.²⁷ For example, the herm in the wood, the halves of a line, or the hand occupy sub-regions of the whole block and the whole line. Thus, they are subject to the doctrine of mereological potentialism.²⁸

2.4.2 The varieties of parts

If I am right, Aristotle has the concept of an arbitrary undetached material part. A mereological conception whose only criterion is that the part is part of the matter of the object. This conception of part encompasses a gerrymandered group of things. The half-line is a part of the

²⁷One could use that principle to introduce an analogue of a region of space in Aristotle by stipulating that a region of space is the place undivided parts would have, if they were taken away. This is suggested by *Physics* IV.5 212b4-212b7: 'As was explained, some things are potentially in place, others actually. So, when you have a homogeneous substance which is continuous, the parts are potentially in place: when the parts are separated, but in contact, like a heap, they are actually in place.' But Aristotle insists that *independent* regions of space cannot exist.

²⁸As I said in fn. 3, a complication I shall largely ignore is the distinction between parts and other ingredients of extended objects. Points, for example, are not *parts* of a line. Only a line is part of a line. In general, only objects that are extended in the same number of dimensions can stand in a part-whole relationship. Still, the points on a line belong to the line and depend on it. And Aristotle evidently thinks that points fall within the scope of the doctrine of mereological potentialism. See *Metaph.* III.5 1002a20-24. He does not distinguish between the status of the surface at which the two halves of a wooden sphere join and the two halves themselves. All of them exist potentially. The only actually existing entity is the wooden sphere itself. This is also a departure from the modern discussion about DAUP which is framed in terms of *regions* of space. Therefore, only three-dimensional parts qualify, since only these are 'receptacles' as defined by Cartwright 1987.

line, a hand is a part of the human, a triangular shaped piece of flesh of the belly is part of the human, the herm in the wood is part of the whole wooden block. They all fall under the extension of material part. The notion of material part does not distinguish between non-functional parts, such as the herm in the stone and the half-line, and functional parts, such as a hand or a liver. This leads to the question whether the way in which herm is in the stone is the same way in which the liver is in the man.²⁹ The liver is a functional part. Its identity is given by the functional contribution it makes to the whole organism. Roughly speaking, to be a liver is to have such-and-such function within an organism and to be of this type of tissue. The herm in the stone or a triangular piece of flesh, to use a part of a human which arguably is similar to the herm, do not make a functional contribution to the whole. This difference may lead us to believe that only the latter, but not the former fall under the scope of mereological potentialism.

This, however, would be a mistake. Both the liver and the triangular shaped piece of flesh are arbitrary undetached material parts in the sense defined above because there is a division of the whole to which the liver corresponds and there is a division of the whole to which the triangular piece of flesh corresponds.³⁰ To use van Inwagen's characterisation, they both lie within a sub-region of the region occupied by the whole. In other words, the notion of part which is relevant for mereological potentialism is the notion of a material part. The concept of a material part encompasses both functional parts, such as the liver or the hand, and non-functional parts, such as the herm in the stone and the triangular shaped piece of flesh. The liver and the triangular shaped piece of flesh in their wholes in exactly the same way: They are material parts in virtue of being part of the matter of an object. Moreover, the fact that the definition of mereological potentialism treats functional and non-functional parts alike is a virtue of it. For, as explained above, one central motivation for adopting mereological potentialism is to account for the unity of a material object. Clearly, then, the doctrine should encompass all parts, not only the subclass of functional parts.

All material parts as long as they are not detached from the whole are merely potential. They are merely potential because they are ontologically dependent on the whole of which they are parts. Consider the case of a hand. The question is whether hands are ontologically independent from the whole. Is the being of hands being-in-actuality? To this the answer is no. As Aristotle explains in Z.16, even though some functional parts seem to be independent of the organism because they have their own source of movement, they nevertheless are only potentially as long as they are part of a continuous whole, i.e. the organism:

Evidently even of the things that are thought to be substances, most are only potentialities, e.g. the parts of animals (for none of them exists separately; and when they are separated, then they too exist, all of them, merely as matter. (...)) One might

²⁹This question was pressed by an anonymous referee.

³⁰See p. 2.4.1.

suppose especially that the parts of living things and the corresponding parts of the soul are both, i.e. exist both actually and potentially, because they have sources of movement in something in their joints; for which reason some animals live when divided. Yet all the parts must be only potentially, when they are one and continuous by nature,—not by force or even by growing together, for such a phenomenon is an abnormality. (Z.16 1040b5-16)

This is a clear statement that all parts - functional and non-functional parts of a human organism are, as long as they are not separated, only potentially. Thus, in terms of mereological potentialism there is not difference between a hand and the herm.

But, of course, this is compatible with the assumption that the way in which these parts depend on the whole is different. The way a *hand* is grounded in the living organism is different from the way in which triangular shaped piece of flesh is grounded in the whole. The hand is a functional part of a human being, whereas the triangular shaped piece of flesh is not. Although I will focus in this paper on an analysis of non-functional parts and my account in section 3 is tailored to them, I will make some remarks on how to integrate functional parts into a more encompassing picture below.

For now, it is important that all material parts, as defined above, are potentially. All material parts of an integrated and unified whole are merely potentially. They all depend, in a sense to be specified, on the whole.

Material parts and substantial change. Related this is another point I mentioned above.³¹ Material parts correspond to the division of an object. However, *what kind* of thing the part is before and after it is separated from the whole need not be the same. This, I suggest, is the crucial point Aristotle makes in Z.16 about the parts of animals in the passage I already quoted above.

Evidently even of the things that are thought to be substances, most are only potentialities, e.g. the parts of animals. For none of them is separately; and when they are separated, then they too exist, all of them, merely as matter. (*Metaph.* VII.16 1040b5-8)

Again, the parts Aristotle is thinking of are *functional* parts, like hands, feet, the head. And all of them are potentially because they do not exist separately from the animal they are parts of. Insofar as they are merely potentially, the ontological status of functional parts is the same as the ontological status of non-functional parts, such as the herm in the wood or the half-line in line.³² However, there is a difference. Things that serve as functional parts cannot exist outside the whole while retaining their function. This is why Aristotle adds that even if the parts of the

³¹see p. 11.

³²This is, of course, *not* to say the ontological status of animals, blocks of wood, or lines is the same.

animal were separated, they would exist merely as matter, that is, they would not exist *as hands* or *as feet*. A severed hand is no longer a hand because only a hand that can fulfil its function is a hand.³³ After being separated from the human, it exists ‘merely as matter’.

Thus, the doctrine of mereological potentialism implies the following with respect to hands: A hand is a potential being. As long as it is an undetached part of a human, it is not ontologically separate. Its being a hand is grounded in the whole organism. Once it is separated from the body, it is actually and it is ontologically independent. But – and this is crucial – *it is not a hand*. It is, as Aristotle says, merely some matter. The contrasting case is the case of the line. The parts of a line are themselves lines. Being separated they exist as lines.

In this sense, separation does not yield an answer to the question *what* the object in question *is* after it has been separated. There is no common answer to the question ‘what do I create when I separate the part?’ In the case of a hand I merely create some pieces of matter, a heap perhaps. In the case in which I remove a part of a parcel of earth, I create two *determinate* parcels of earth. Here are some examples:

What the part is before the separation	What the part is after the separation
a hand	some piece of matter
a triangular shaped piece of flesh	some piece of matter
a (half-) line	a line
A herm-like internal part of a block of wood	a herm

There is a sense, then, in which we can say that *one and the same thing* first existed as a hand and later as some undefined piece of matter. In other words, our account commits us to the view that things can survive a sortal change. Separation is the generation of a new object. How this is possible will be explained in section 3.1.2.

2.4.3 A general definition of mereological potentialism

To sum up: mereological potentialism is a doctrine concerning the relation between the parts and the whole. It roughly says that the actuality of parts implies the potentiality of the whole, and the actuality of the whole implies the potentiality of the parts. Aristotle has such a doctrine and he has it for a reason. His main reason is to account for the unity of a material object and, ultimately, of material substances. This allows us to define the doctrine of mereological

³³Cf. *De An.* II.1 412b1-24; *Metaph.* VII.10 1035b23-25. This has come to be known as Aristotle’s ‘homonymy principle’. For discussion of these issues cf. Shields 1999, 131-154.

potentialism as it is found in Aristotle:³⁴

Mereological Potentialism. (1) *Material parts of a material and continuous whole that is actually and undivided are not themselves actually as long as they are not taken away; (2) a material and continuous whole whose material parts are actually and are taken away from the whole is not itself actually for as long as it is divided. Clause (1) and (2) are conditions for the unity of a whole.*

The two clauses roughly say that the actuality of the parts and the actuality of the whole are mutually exclusive. A whole, as long as it is a whole, cannot have parts that exist actually. If the parts of a whole exist actually, the whole exists only potentially. Moreover, from this definition one can see that there is an important connection between actuality and the divisions. In this way, the concept of division does double duty in the definition of mereological potentialism. For, the concept of division is crucial in an explanation both of the relevant parts (material parts correspond to the division of the whole) and of the notion of potentiality that is involved in the doctrine. If the whole is divided into its parts, the parts are actually, but as long as the whole is undivided, they are potentially. In this way, the twin concepts of division and taking away will guide our understanding of how we can make sense of the potential being of a part. This is the topic of section 3.³⁵

2.4.4 Being divisible and being divided - Types of objects again

The distinction between being divisible and being divided is essential for the doctrine of mereological potentialism. A whole is divisible, but as long as it is undivided it is one whole. Once it is divided, it is no longer one unified whole. It seems that this distinction does not straightforwardly apply to unextended and non-material objects.³⁶ The question whether the soul is

³⁴We find a quite similar version of the doctrine in Smith 1994. He expresses it as a conjunction of two claims: ‘(1) A part of something actually real is not itself actually real as long as it is a part; (2) a whole whose parts are actually real is not itself actually real as long as it is a whole’ (Smith 1994, 79). Since Smith believes himself to have developed the doctrines from Aristotelian material, the similarity of definitions should not come as a surprise. Nevertheless, the doctrine, as it is stated by Smith, should not be attributed to Aristotle. First, Aristotle, as we will see, does not use – at least not explicitly – the notion of reality. Second, Aristotle does not use the notion of part in a completely general way in his version of mereological potentialism. Where Smith only speaks of ‘parts’, Aristotle speaks of a specific kind of part.

³⁵A final note: it may go without saying, but it is nevertheless important to distinguish mereological potentialism from a dependence relation that holds between substances and non-substances. A theatre performance (non-substance), e.g., depends on the human beings (substances) that perform it. But they do not differ with respect to actuality. Strictly speaking, mereological potentialism, as stated above, does not yet say that the parts *depend* on the whole or the whole on the parts. It only states that the actuality of the parts excludes the actuality of the whole and vice versa.

³⁶In *Metaph.* XIII.7 1084b20-23, Aristotle seems to suggest that the doctrine applies to numbers. The parts of number must be potentially, if the number is to be one. But the passage is extremely difficult and I do not think that a final verdict can be given. The principle of unity for collections —a number is a collection of monads and an abstraction from groups of material objects— is hard to give and Aristotle’s focus clearly lies on material and continuous objects.

divisible into its parts or is so divided is unclear, because the division is mainly logical. Either the soul's parts are logically distinct and the soul is divided, or the parts of the soul are not logically distinct and the soul is undivided. But it hardly makes sense to say that the soul is divisible because its parts are logically distinct, and yet it is undivided. I think this point is well-put by Philoponus in his commentary on the third book of Aristotle's *De Anima*.

So he has three charges against Plato. One, that he divides the soul as a whole into parts. For it is quite impossible to divide it into parts; for in the case of incorporeal things it is the same to be divisible into parts and to be divided; for incorporeal things do not have to wait for a period of time or for the cut from what goes through them. So if the soul is divisible into parts it will be divided and the whole will vanish. For it will have ceased to be even that there is a common whole when the parts have been divided in actuality from one another. But in the case of bodies it is one thing to be divisible into parts and another to be divided.³⁷ (Phlp. *in de An.* 571.29-34)

Philoponus argues that in the case of the soul the whole cannot have parts into which it is divisible without actually being divided into them. There is no analogue to the process of cutting a whole. Philoponus' phrase 'the cut from what goes through them' vividly illustrates the sense of dividing that is central to mereological potentialism. It is literally removing a part of something. But the contrast between a material whole which is divided into several wholes such that all of them are independent wholes and a material whole that has parts into which it might be divided is not applicable to incorporeal things. What would be an analogous way of cutting them? It is difficult to make sense of this. We have, I think, a deeply engrained intuition, shared by Philoponus, that there is a distinction between being divided and being divisible in the case of material objects; a distinction which has no direct analogue in the case of non-material objects. It is connected, I suggest, to the spatial nature of material objects. Dividing an object can be seen as resulting in a spatial separation of the parts. After having divided an object, it seems possible that another object can be located between the parts of the divided object. In the case of the parts of the soul this seems not possible. Therefore, I am inclined to think that insofar as the thesis of mereological potentialism is connected to the concept of division, mereological potentialism is a thesis about extended material objects.³⁸

³⁷Translation by Charlton 2000.

³⁸I am aware that Aristotle himself speaks of soul parts that are contained potentially (*de An.* II.4 414b28-32). But it seems to me that to speak of the potentiality of soul parts is to speak of something very different from mereological potentialism. Of course, one can always assign a different meaning to what it is to be divisible or divided. One could say that a soul is divisible if it is possible that some parts of the soul are instantiated without other parts being instantiated as well. This is, however, a different issue and has more to do with actual and possible extensions of a term than with a whole whose parts exist potentially.

3 Explaining Mereological Potentialism

The thesis of mereological potentialism is quite important for Aristotle's theory of substance. For it rules out that the parts of a substance are substances themselves. However, the doctrine itself is rather dark. What does it mean to say that a part are potentially? What we have established so far is a correspondence between being in actuality and being in potentiality, on one side, and being undivided and being divided, on the other side. If a part is undetached, it is potentially. If a part is separated from the whole, it is actually. This correspondence does not, however, explain what it is for a part to be potentially or actually. In the following section I will address this problem and argue that the potentiality or actuality of the parts is explained by the concept of ontological independence. Undetached parts are not ontologically independent of the whole. Ontological independence should, in turn, be understood, I will argue, as a version of the priority of the whole over its parts.

3.1 What is it for a part to be potentially?

What, then, does it mean to say that a part is potentially? I already remarked at the beginning that it cannot mean that the parts do not exist at all. After all, the parts are in the domain of quantification and they can be referred to with pronouns. They might even have names, for example the herm in the wood could be called 'Hermes'. We might again compare it to the question modern day philosophers ask about the existence of arbitrary undetached parts. Anyone who denies the existence of arbitrary undetached parts is faced with the following sort of argument:

If the object didn't completely fill up the left half of the region it occupies, then it wouldn't be occupying the whole of that region after all. And since the left half-region does not contain the *whole* object, it must be exactly filled by only a *part* of it. (Zimmermann 1996, 8)

Zimmermann's argument illustrates the pressure to acknowledge that undetached parts exist. They occupy places.³⁹ Thus, there must be *something* in the sub-regions of the whole region an object occupies. And this cannot be the whole object, because the *whole* object occupies a larger region. Hence, it must be a *part* of the whole object that occupies the region. Hence, undetached parts exist.

On the other hand, there is also a reason to say that they do not exist in the same way as the whole. Consider the case in which a bust of Socrates (actually shaped) and a lump of stone

³⁹Aristotle famously thinks that it is not the case that parts have places, but we can ignore this idiosyncrasy of Aristotle's theory. For there are some properties where Aristotle would agree that they pertain to the parts of objects. For example, colors.

(containing the herm) exist in the studio of an artist. It would be outlandish to answer the question ‘How many busts are in the studio?’ by saying ‘Two’. That is to say, there is a way to count objects in which potentially existing objects do not appear.⁴⁰ In many contexts the undetached parts of an objects are not taken into consideration. In the studio of the artist we see a block of stone. Typically, as long as the block is not worked on by the artist, we neglect the fact that it has a herm as a part. Only when the artist begins chiselling the stone and creating a herm do we say that there is a herm contained in the block of wood. Only when the division of an object occurs are its undetached parts taken into consideration. This is nicely stated by Casati and Varzi who write:

There are two distinct ingredients in the idea that certain proper parts are merely potential objects. The first is detachability. When we think of an object that is topologically all of a piece, we neglect its parts. It is not that we positively think that such an object has no parts. But we do not take parts into account until there is some need to detach—physically, or in the imagination—one or more of them. (Casati and Varzi 1999, 99)

When thinking of topologically unified objects, especially those that do not have joints, we think of them as wholes and neglect the parts. It is important to emphasize, as Casati and Varzi do, that this does not mean that we are inclined to believe that the object has no parts. When asked whether the object has parts, we would readily admit that it has parts. But in a sense these parts do not get counted or do not matter in the same way as the whole. Only when it comes to a division of the object or the detachment of the parts do we take the parts into account.

The reason for this, at least in the case of Aristotle, is that undetached parts are not ontologically independent and separate objects. Aristotle acknowledges the existence of undetached parts, but not as ontologically independent objects. To say that the parts are potentially, thus, encapsulates two thoughts. Firstly, parts are potentially because they are not ontologically independent objects, but they could become ontologically independent objects. In this sense, separation leads to the creation of a new, ontologically separate object. Secondly, the parts are potentially because their being not ontologically independent objects implies that they are individuated by reference to the whole. The parts are potentially *because* the whole can be divided into them. The possible divisions of the whole determine what parts are ‘there’. We refer to the parts by pointing to the ways in which the whole can be divided.⁴¹

⁴⁰Casati and Varzi 1999, 100.

⁴¹This, I believe, is the background of assertions like the one by Coope: ‘For the line to be infinitely divisible is for there to be no limit to the number of divisions that *could be made* in it, not for it to contain an unlimited number of *makeable divisions*’ (Coope 2005, 11). In speaking of divisions that could be made, we refer to the whole and its possibilities. But in speaking of makeable divisions we wrongly suggest that these divisions are there independently of the whole. This is at least how I am inclined to interpret it. For it seems to me that it is perfectly legitimate to say that separating the half is a makeable division, as long as we make clear that the whole line is ontologically prior and it is a makeable division *because* the whole line could be divided in halves.

3.1.1 Potentiality, separation and ontological independence

To say that the parts of an object are potentially is to deny them the status of ontological independence. Being not separate is more than just being undetached. It means that the object in question is ontologically dependent. Aristotle illustrates this in the following two passages.

Moreover every kind of shape is equally present in a solid, so that if ‘the herm is not in the stone,’ neither is the half-cube in the cube as something separate / marked of (ὥς ἀφωρισμένον). Hence neither is the plane; for if any kind of plane were in it, so would that plane be which defines the half-cube. The same argument applies to the line and to the point or unit. (*Metaph.* III.5 1002a20-25)

Evidently even of the things that are thought to be substances, most are only potentialities, e.g. the parts of animals. For none of them is separately (κεχωρισμένον). (*Metaph.* VII.16 1040b5-7)

One may suppose that Aristotle denies in the first quotation that the herm is in the wood *at all*. On a closer reading, however, we see that he denies that the herm is in the wood as something separate or determinate.⁴² It may be true to say that the herm is in the wood, but the herm is not in the wood by being separate. The line of thought is the following: As long as the herm is undetached from whole it is merely potentially because its being is grounded in the whole. This fact implies that the herm is not separate, i.e. ontologically independent.

The same is true of the second passage, which I have already discussed. Aristotle denies that the parts of animals are substances because they are not separate. Again, being not separate in this context is stronger than merely being undetached. It would be a poor argument to say that the parts are not substances because they are undetached. After all, everybody agrees that the parts of animals typically are undetached. But if ‘separation’ is taken to mean ‘being an ontologically separate object’, the argument begins to make sense. If the parts of an animal are not separate, it is obvious why they cannot be substances. For it is a mark of being a substance to be separate.⁴³

⁴²Of course, one has to be careful with passages from book *Beta*, since Aristotle is mainly concerned with difficulties in this book and it is not clear when he utters his own opinion. Yet, since this passage is in agreement with Aristotle’s considered views and commentators agree that this represents Aristotle’s position (cf. Mueller 2009), I feel entitled to use it as support for my claims.

⁴³The semantics of ‘to be separated (ἀφωρισμένον or κεχωρισμένον)’ are close to the notion of χωριστόν and emphasise the ontological independence of an object. All of these words are derived from ‘χωρίζειν’. This is also corroborated by the following passages: ‘It remains to go through the arguments which are supposed to support the view that the infinite exists not only potentially but as a separate thing. Some have no cogency; others can be met by fresh objections that are true’ (*Ph.* III.8 208a5-8). ‘For everything that comes to be comes to be in something, and that in which the generation takes place must either be incorporeal or possess body; and if it has body, there will be two bodies in the same place at the same time, viz. that which is coming to be and that which was previously there, while if it is incorporeal, there must be a separate void. But we have already shown that this is impossible’ (*Cael.* III.6 305a16-22). In both quotations the meaning of ‘to be separated’ is used to indicate ontological independence. Both the infinite

We may graphically represent the idea as follows: The rectangle W

a	b
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 contains the two parts a and b . The correct answer to the question ‘What is there?’ is ‘There is one actual and separate rectangle, namely W ’. The parts a and b are not in the same way as W . For, if they did, then W wouldn’t be a single rectangle. It would not have the required unity for a single object. That is to say, a and b are not separate. It is W that is separate. If W were divided, a and b would be separate. In this situation

a	b
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 are two ontologically independent rectangles.

Wholes: Ontological Independence. *If a whole is undivided, its parts are not ontologically separate. If the parts are taken from the whole, they are ontologically separate.*

3.1.2 Separation and generation

If whole is divided, its parts are ontologically independent objects. In this sense, separation is a change in the ontological status of the object. As Aristotle makes clear in a passage in the *Physics*, this change is a generation of a new object:

Things which come to be without qualification, come to be in different ways: by change of shape, as a statue; by addition, as things which grow; by taking away, as the Hermes from the stone; by putting together, as a house; by alteration, as things which turn in respect of their matter. (*Ph.* I.7 190b5-9)

Aristotle delineates several ways in which things come to be without qualification. If the herm is taken away from the whole, it comes to be without qualification. That is to say, separation and division are not qualitative or other changes in the whole. It is, Aristotle suggests, the destruction of the whole and the generation of a new substance. If this is correct so far, ontological separation, which is effected by the division of the whole, is the birth of a new object.

This, however, sounds problematic. For, in what sense can the herm be *newly* created, if it was already there ready to be brought to light? After all, there is *the* herm, which first is potentially and then is actually. We can, e.g., refer to the herm, even if it is in the block of stone. How can this be reconciled with the fact that the herm is generated when it is taken from the block of stone? One may think that it is more like a qualitative change. There is an object, the herm, that acquires a new property. The change in the herm would be akin to the way in which a substance acquires a new color.

Although there is admittedly a tension between the fact that the herm can be referred to by pronouns and the fact that it comes into existence, I think that the following consideration speak in favor of the idea that the herm is created when it is taken away from the stone. The subject of a qualitative change already is in actuality. This is emphasized by Charlton, who

and the void do not exist on their own. Sometimes Aristotle uses the word ‘ἀποκεκρυμμένον’ that should also be translated as ‘being separated off’ and which expresses the same idea. Cf. *Metaph.* IX.6 1048b3; *Metaph.* XI.6 1063b29–30.

remarks that ‘what could become something must be already something else and already exist’ (Charlton 2003, 133). If Socrates comes to be musical, Socrates himself is already a substance in actuality. On the other hand, the herm, before it is separated, is not in actuality. As I will argue in section 3.2, the herm is individuated by the capacities possessed by the block of stone and, in this sense, depends in its being what it is on the block of stone. Thus, even though we can refer to the parts by using pronouns, we cannot do so independently of the whole. The parts are not ‘there’, ready to acquire a new property. Rather, they are ‘there’ only insofar as there is a whole to which they belong and insofar as they could become ontologically independent.

If this is right, there is perfectly legitimate to speak of a generation when parts are separated from the whole. Furthermore, the point about generation also helps to bring out a distinctive feature about mereological potentialism. Consider again the case of other ontological dependent items, such as colors. Philosophers often assume that colors are ontologically dependent on substances. But colors are not potentially. The redness of a ball is ontologically dependent, but is actually. In contrast to that, the herm in the stone is not actually. Now we can see better why: For in an important sense the herm is not yet generated. It *is* and has *being* as a possible division of the whole, to be sure. But to be actually it would have to be generated by being carved out of the stone.

3.2 The priority of the (actually existing) whole, grounding and individuation

3.2.1 The potentiality of the parts and the potentiality of the whole

In section 2.1 I argued that there is indeed a robust version of mereological potentialism present in Aristotle. ‘Being potentially’ pertains to the undetached parts. With this interpretation, I reject any interpretation on which ‘being potentially’ pertains primarily to the whole. It is not the wood which is potentially. Mereological potentialism makes first and foremost make a claim about the potential being of the parts, rather than the potentialities of the whole.

This, however, is compatible with an analysis according to which the fact that the herm is in the wood is grounded in the fact that the wood can be made into a herm. Both the herm and the wood have capacities. The wood has the capacity to be made into a herm and the herm has the capacity to be separate and exist ontologically independent as a finished statue. Importantly, their potentialities are not unrelated. To the contrary, the herm has its capacities only because and in virtue of the fact that the block of wood has the capacity to be made into a herm. In the order of the metaphysical explanation the whole is prior to its undivided parts:

1. There is an object O which is actually.
2. O has a certain capacity to be divided in such and such a way.

3. To these ways correspond the parts of O which are potentially.
4. The capacity of O to be divided in such and such a way grounds the potential being of the parts.

In this sense, the potentiality of the herm plays second fiddle to the potentialities of the wooden block. More generally, the potentialities of the parts are grounded in the potentialities of the whole. The whole is prior to its undivided parts because the being of the parts is grounded in the being of the whole.

3.2.2 Ontological dependence of parts on wholes.

In the last section I relied on the notion of ground in explaining the doctrine of mereological potentialism. Aristotle himself does not use explicitly the terminology of grounding, but in many of his discussions he apparently employs the notion of ground.⁴⁴

Ontological dependence - a general remark. Grounding, quite generally, can be used to characterise ontological dependence.⁴⁵ In recent years, this characterisation has found its way to Aristotle. A major reason has been a growing dissatisfaction with the characterisation of ontological independence as a capacity for independent existence (IE).⁴⁶ According to this interpretation, x is ontologically independent from y and y ontologically dependent on x iff x can exist without y, but not *vice versa*. A problem with this characterisation is that it apparently yields the wrong results in many cases. E.g., a substance is ontologically independent from its accidents and the accidents depend on the substance, but it seems that the substance cannot exist without its accidents. There have been various attempts to refine the notion in such a way to exclude these counterexamples which I will repeat here.⁴⁷ Rather, it seems that IE is simply not the correct way to approach the question of ontological independence.

⁴⁴Consider the following quote from the *Categories*: “For of things which reciprocate as to implication of existence, that which is in some way the cause of the other’s existence might reasonably be called prior by nature. And that there are some such cases is clear. For there being a man reciprocates as to implication of existence with the true statement about it: if there is a man, the statement whereby we say that there is a man is true, and reciprocally—since if the statement whereby we say that there is a man is true, there is a man. And whereas the true statement is in no way the cause of the actual thing’s existence, the actual thing does seem in some way the cause of the statement’s being true: it is because the actual thing exists or does not that the statement is called true or false” (*Cat.* 11 14b11-22). Given passages like this, it is not surprising that modern-day philosophers, such as Schaffer 2009, sometimes take Aristotle as their starting point for a discussion of grounding.

⁴⁵For a discussion of grounding see papers mentioned in fn. 17.

⁴⁶The *locus classicus* is Fine 1984. There has been an extensive debate over the question whether “χωριστόν” means “being separate” or “being separable”. That is, whether it indicates actual separation, as Morrison 1985a,c,b argues, or a *capacity* to be separated, as Fine 1984, 1985 argues. I believe that Fine’s position is to be preferred, but, since the debate is connected to the existential interpretation of ontological independence, we need not decide the question here.

⁴⁷For a discussion of the various moves which are possible see Corkum 2008, 71-76.

As a better alternative Phil Corkum proposes the following:

OI A is *ontologically independent* from B just in case A admits of the ontological status of a being independently of standing in some tie to B.⁴⁸

As Corkum notes, this formulation “is not an *account* of ontological independence at all” (Corkum 2008, 81). It is consistent with the view that “Aristotle has an irreducibly pluralist account of ontological dependence” (Corkum 2008, 82). A genuine account of ontological independence or dependence has to satisfy OI, but it also needs to do more: It has to spell out what the “tie” consists in.

One recent suggestion for spelling out the tie is made by Peramatzis who argues that priority in being (PIB) is the “ontological correlate of definitional priority” (Peramatzis 2011, 224):

PIB A is ontologically prior to B if and only if A can be what it is independently of B being what it is, while the converse is not the case.⁴⁹

Peramatzis develops his account, among others, with respect to the following passage in *Metaphysics* V.11:

If we consider the various senses of ‘being’, firstly the subject is prior (so that substance is prior); secondly, according as capacity or actuality is taken into account, different things are prior, for some things are prior in respect of capacity, others in respect of actuality, e.g. in capacity the half line is prior to the whole line and the part to the whole and the matter to the substance, but in actuality these are posterior; for it is only when the whole is dissolved that they will exist in actuality. (*Metaph.* V.11)

Aristotle connects the account of priority in being with being in capacity and being in actuality. Following Peramatzis’ formulation, we can say that potential beings are ontologically dependent on actual beings because they cannot be *what they are* independently of the actual beings. For our immediate purposes it is, of course, most relevant that Aristotle refers in this passage to the case of the half-line which is, as I argued, an example of material parts. In this way, Peramatzis’ general account of PIB lines up well with the thrust of my argument. The half-line depends on or is grounded in the whole line because what it is to be a half line depends on what it is to be a whole line.⁵⁰ However, I am inclined to believe that PIB is not merely mirroring definitional priority. A more precise account of the way in which parts are grounded in the whole can be given.

⁴⁸For this formulation see Corkum 2008, 77.

⁴⁹For this formulation see Peramatzis 2011, 204. For his general account see Peramatzis 2011, 219-229.

⁵⁰Peramatzis 2011, 225.

How parts are grounded in the whole. To address the question how parts are grounded in the whole, let us start by considering how, according to Aristotle, the herm that is in the wood is actualized. The herm is an artifact. Thus, for a herm to come from a block of wood, a sculptor who possesses the art of making statues must be present.⁵¹ The sculptor has the form of the herm in her mind. In making the herm, she imposes the statue-form on some matter, but not any kind of matter. The matter must be capable of being built into a herm. But the matter has this capacity only if it is the right type of matter and is in the right kind of condition to be made into a herm. Aristotle expresses this point in the *Metaphysics* as follows:

Similarly there is potentially a house, if nothing in the thing acted on—i.e. in the matter—prevents it from becoming a house, and if there is nothing which must be added or taken away or changed; this is potentially a house, and the same is true of all other things for which the source of their becoming is external. (*Metaph.* IX.7 1049a8-12)

Artefacts have an external source of their becoming which is to say that an artist must be present to produce them. They do not come to be due to an internal principle of motion and rest, as it is the case with natural beings. But the important claim for our purposes is that the matter must be in the right condition to be acted upon. A tree has not a herm as a part, not even potentially. For the tree does not yet have the capacity to be made into herm. First, the tree would have to be cut down and further processed until it nothing would have to be changed and it could be made into a herm. What this example should convey is how the capacities of the whole ground the being of the parts. The capacities of the block of wood explain why the block of wood can be made into a herm. The herm is potentially because and in virtue of *specific* capacities of the wood to be divided in such and such ways.⁵²

This form of the priority of the whole over its undetached parts is intimately connected to Aristotle's general claim that actuality is prior to potentiality.⁵³ In line with this, it is natural to ground the capacities in the actual being. If there is a block of wood in actuality, the herm is in virtue of the capacities the block of wood has. Aristotle, I believe, is referring to this kind of grounding relation in his remarks in *Metaph.* IX.6:

⁵¹I believe that this story can be found in *Metaphysics* VII.7-9. But I will not refer to specific passages.

⁵²Incidentally, we may note that this also explains why the herm that is in the wood is not a fully determinate object. Consider the artist who is going to produce a herm. It is true to say that there is a potentially existing herm in the wood. Yet it is also true that the artist can produce different herms out of the same block of wood (though not at the same time). It is possible to make a herm with a long nose or a herm with a short nose. When I say that there is a herm in the wood, to which of these do I refer? It seems that there is no determinate answer. One could say that *the* herm, as long as it is in the wood, is not fully determinate. There is no answer to the question whether it has a long or a short nose. Both are ways to actualise the herm. Or one could say that the reference of 'the herm' is not determinate. There are many different potentially existing herms in the wood, and the description 'the herm that is in the wood' applies to all of them. 'The herm in the wood' would not be a definite description that has only one referent. But in both cases there is no definite answer to the question whether *the* herm that is in the wood has a long or a short nose. I myself prefer the first explanation and believe that it is closer to Aristotle, but I shall not defend it here.

⁵³Cf. *Metaph.* IX.8.

Actuality, then, is the being of a thing not in the way which we express by 'potentially'; we say that potentially, for instance, the herm is in the block of wood and the half-line is in the whole, because it might be taken away. (*Metaph.* IX.6 1048a30-33)

The crucial word is 'because'. The half-line and the herm are because they can be taken away. Their being is grounded in the fact that the whole of which they are parts can be divided in such and such ways. If the wood were to lose its capacity to be divided in such and such parts, it would be false to say that there is potentially a herm. Since the block of wood is actually, whereas the herm is potentially, the capacities of the wood should ground the capacities of the herm. In this sense, the whole is ontologically prior to and grounds the being of the parts.

We can substantiate this point from a slightly different perspective as well. The undivided parts depend on a whole because they are individuated by the capacities of the whole. The way in which the herm is in the wood is not the way in which shoes are in a box. The shoes are actually. They do not depend on the box in the way the herm depends on the capacities of the wood. The shoes are actually in the box and are individuated without reference to the box. If the box contains a pair of black sneakers, only those sneakers can be taken out of the box. The block of wood, contrary to that, can be made into a herm or a bust of Socrates. Both the herm and the bust of Socrates are possible divisions of the wooden block. There is a division according to which the herm is created and there is a division according to which the bust of Socrates is created. But, we may assume, it is impossible that *both* are carved out of the wood. The herm and the bust of Socrates cannot both be in actuality. But the reason why they cannot both be in actuality is not that the herm and a bust of Socrates exclude each other. The reason is that the piece of wood cannot be made into both at the same time. If the parts were to determine the capacities of the wood, it would be a mystery why wood cannot be turned both into a herm and into a bust of Socrates. Therefore, the capacities of the whole must be prior.

In general, the range of possible division is determined by the actual object. The being of the material parts is grounded in facts about the actual object and the way in which it can be divided. A material part not only *corresponds* to a division of the whole, but its being the material part it is is grounded in the capacities of the whole. It is in virtue of the fact that X is divisible in such and such ways that the material parts of the object exist.

This is, I propose, a version of the priority in being or ontological priority of the whole over its parts. It also satisfies OI: For any given material part has its status as a being in virtue of the divisibility of the whole. The capacities of X explain why there is a material object which is part of the matter of X.

How are functional parts grounded? The account I have given explains the being of material parts. It seems ill-suited to explain the being of functional parts.⁵⁴ A hand, e.g., does not

⁵⁴This challenge was raised by an anonymous referee.

depend in its identity on the possible divisions of the whole. The identity of functional parts is determined by the whole, too, albeit not in the same way. Thus, one may argue, that my account is incomplete. However, as I remarked above,⁵⁵ both functional and non-functional parts are material parts of the object and are potentially because they depend in their being on the division of the whole. But, as I have also argued,⁵⁶ the concept of division in itself does not explain what a part is before and after it has been separated. I have explained why it is true to say that in any given sub-region of the extension of an object X there is part which has being in potentiality. I have not explained why some of these parts have a function within the whole. Therefore, we must distinguish two questions: How is the being of an arbitrary undetached part grounded? How is the being of a functional part grounded?

Take the example of the herm and the hand: If the hand is severed, what is it? It is, let us assume, some flesh. On this account, flesh is a non-functional part of a human. The part, i.e. this flesh, after having been severed from the the body, is actually. Before it has been severed, *this* piece of flesh was potentially. In this way, the relation between the flesh and the human is the same as the relation between the herm and the wood. Some piece of flesh is a material part of a human just as the herm is a material part of the wood.

There is, however, a dissimilarity: Whereas flesh can exist outside the human being, as we assumed for the sake of argument, a hand exists only as as part of the human being. For a hand to be is for it to fulfil a certain function within an organism. A severed hand is no longer a hand. This is the core idea of Aristotle's famous homonymy claim:

For it is not a hand in any state that is a part of man, but the hand which can fulfil its work, which therefore must be alive; if it is not alive it is not a part. (Z.11 1036b30-32)

Only the living hand which fulfils its work is properly called a hand. Its identity as a *hand* is grounded in the functional connection it has to the whole of the organism.

As a result, we have to distinguish between the way in which an arbitrary undetached part is grounded in the whole. My answer is that all these parts have their ontological status because they can be separated from the whole. The capacity of the whole to be divided in such and such ways grounds the being of its parts. With this, we consider the part insofar as it can be actually *outside* of the whole. *That* thing which is a hand is potentially because it can be separated from the whole. This, however, is not an explanation of what it is to be a hand. It is an explanation why the part has being in potentiality. In order to explain why this part is a hand, we have to rely on functional considerations. With this, we do not consider the part insofar as it can be separated from the whole, nor do we consider whether it has being in potentiality or being in

⁵⁵Cf. p. 17.

⁵⁶Cf. p. 2.4.2.

actuality. What we do ask, instead, is why this specific arbitrary undetached part is a hand. A hand can never exist independently of the whole. Certainly, there is *something* to which we can refer to with a pronoun which now is a hand, but later will be separate from the whole. So, there is a sense in which a functional part, such as a hand, can exist independently of the whole. But, as I have tried to explain, this merely means that a new whole (some flesh, not a hand!) has come into existence and now is actually. This new whole had being in potentiality because it could be separated.

3.2.3 Parts and Individuation

The order of metaphysical explanation can be further elucidated if we reflect on the way in which reference to the parts and reference to the whole are linked. A good illustration of the link is given by Charlton:

To deny that the parts of an undivided whole exist ἐνεργείᾳ is to deny that ‘The beam could be sawn into five cubes’ is more perspicuously rendered by ‘There are five cubes and the beam could be sawn into them’. (...) Dividing into five cubes is a possible way of dividing the beam, so five cubes are a possibility or exist as possibilities. (Charlton 1991, 133-4)

Charlton himself draws the conclusion that referring to the whole precludes referring to the parts. But this cannot be right, as we have seen. It is not false to say that there are five cubes. Therefore, I think what he is getting at should be better expressed by saying that reference to the parts depends on reference to the whole.⁵⁷ It is misleading to refer to the cubes independently of the whole beam. To say ‘There are five cubes and the beam could be sawn into them’ suggests that there are *two* independent facts. One is that there are five cubes and the other that the beam could be sawn into them. But this is not the case. To speak of five cubes is, ultimately, to speak of a way of dividing the beam. This is why ‘The beam could be sawn into five cubes’ is not more perspicuously rendered by ‘There are five cubes and the beam could be sawn into them’. The cubes are there *insofar as the whole can be divided into them*. But as long as the whole beam is not divided, the parts are individuated by and have their being as possible divisions of the whole.⁵⁸

3.2.4 A paradox?

In some places, Aristotle suggests that even to *think* of a part is to divide the whole. This seemingly leads to a paradox. For if thinking about the parts means dividing the whole, how can we say anything about the whole *and* its parts?

⁵⁷Though I am not claiming that Charlton would agree with my analysis here.

⁵⁸This also explains why the sentence ‘The beam could be sawn into five cubes’ and the sentence ‘The beam could be sawn into seven cubes’ are compatible and, in fact, are both true. But it does not follow that there are twelve cubes (not even potentially). Cf. Charlton (1991), 134.

It is not possible, then, to tell what part of the line it was thinking of in each half of the time: the object has no [halves], until it has been divided, but only potentially; if in thought you think of each half separately, then by the same act you divided the time also, the half-lines becoming as it were new wholes of length. (*de An.* III.6 430b10-13)

This passage brings the potentiality of the parts to an extreme. If one thinks of a line in a certain time, it is not possible to say of which of the halves one thought of in which part of the time. One thinks of the *whole* line in the *whole* time. In this way, a continuous thing is seemingly simple.⁵⁹ If one thinks of the halves as separate, one divides the line and thinks of *two* new lines instead. Passages like this may contribute to the belief that an undivided whole has no parts whatsoever. Once we think of the parts, the whole no longer is.⁶⁰

There are two replies to this, I think. First, one can make an unspecific and indeterminate reference to the parts without dividing the whole. Here is an example of such a thought involving parts: ‘All the parts of the *whole* line are connected by a boundary’. This is, I suggest, not a way of considering the halves *separately*. One thinks of the whole as something that is connected. What Aristotle denies in the quotation is that there is a way of thinking of the halves as separate from the whole. If one were to think in this way, the lines would be separate and the whole would no longer be.

Yet, this answer is not fully satisfactory. For, as I have argued above, very often when we speak about parts we refer to them by names or pronouns. We want to be able to utter true sentences like ‘the left half of this object occupies this region of space’. Can Aristotle accommodate our intuitions here? Can we make reference to the parts of the line, individually and one by one, without thereby creating new wholes, as *De Anima* III.6 suggests? This brings me to the second reply.

Aristotle, I think, can solve this puzzle within his own theory. We can extract Aristotle’s solution from an interesting passage in the sixth book of the *Physics*.⁶¹ In my discussion of it I am indebted to him. The problem Aristotle discusses in this passage is an argument to the effect that everything which is moving has done some previous moving.⁶²

⁵⁹‘Solange ein Kontinuierliches nicht geteilt wird, ist es ein Einfaches und wird als solches erkannt; dies bestätigt wiederum, dass Aristoteles das Kontinuum nicht als *aus* Teilen aufgebaut denkt’ (Wieland 1975, 284). Notice that Wieland does not say that something continuous has no parts, but that it is not made up of its parts. Thus I believe that Wieland’s position is compatible with the version of the priority of the whole I address.

⁶⁰Aristotle’s discussion of Zeno’s runner paradox in *Ph.* VIII.8 263a23-b9 may seem to support this reading, too. Aristotle maintains that it is impossible to traverse an infinitely divisible distance by ‘actualising’ the points which lie on the line. The reason is that to actualise a point is to divide the line in which case one would have to make a stop. Since there infinitely many points one could actualise, one would never be able to traverse the distance. One way to actualise a point and, hence, divide the line is counting. Since counting is a mental operation, this suggests that merely thinking of the parts or points makes it impossible to traverse the distance. For a critical discussion of this passage see Bostock 2006b.

⁶¹I want to thank Caleb Cohoe for pointing out the relevance of this passage to me.

⁶²The argument is about motion and I do not want to claim that in this passage Aristotle explicitly addressed

It is evident that everything that is in motion must be in a state of having done some previous motion. For if it has moved in the distance KL in the primary time TR, in half the time a thing that is in motion with equal velocity and began its motion at the same time will have traversed half the distance. But if the thing whose velocity is equal has traversed a certain distance in the same time, the original thing that is in motion must have traversed the same distance. Hence, that which is in motion must have been in motion before. (*Ph.* VI.6 236b33-237a3)

Aristotle wants to argue that everything that is in motion is in a state of having done some previous motion. If an object moves over some distance, then while being in motion it has done some previous motion. Aristotle's claim is that the object *while moving* has already done some motion. Thus, the argument concerns an object that is still moving. But how can Aristotle prove this? The problem is that the motion the object undergoes has not stopped. The object is, as I said, still moving. One could think that the moving object is in a state of having done some previous motion because *it has completed a motion to this point*. However, to argue that the object *has moved to this point* would involve a division of the motion according to Aristotle. This is obvious from his response to Zeno's paradoxes in *Physics* VIII.8. To say that an object has moved first one half-distance and then moved the other half involves a division of the motion.

In the case of counting the halves, it is clear that this result follows; for then one point must be reckoned as two: it will be the end of the one half and the beginning of the other, if he counts not the one continuous whole but the two halves. (*Ph.* VIII.8 263a30-b3)

But a division of the motion implies that the original motion has stopped. The problem then is how Aristotle can show that every object in motion has done some motion without dividing the motion. For, according to the passage in *Physics* VIII.8, to say that the moving thing *has completed some motion* is to divide the motion. It is as if one were to say that the object has first moved a certain distance and completed a motion and then continued its motion. But this is no longer a continuous motion. Rather, these are *two* motions. The question Aristotle set out to answer is, however, not whether a moving thing has done some motion whenever it is stopped, but whether an object moving continuously and still being in motion has done some previous motion. In other words, Aristotle wants to prove something about a *part* of a continuous motion. He wants to prove that an object that is moving the whole distance has, while still moving, done some previous motion. But how can one deduce something about a part of a motion without separating it and dividing the whole?

Aristotle's procedure is ingenious. From the way he proceeds in his argument it becomes clear that he considers a *second* object which is relevantly similar to the first. If this second

the puzzle how one can make reference to undetached parts. Rather my point is that in his discussion of a problem concerning motion Aristotle provides the conceptual tools needed for a solution of our puzzle.

object starts at the same time with the same speed, it will have moved the same distance as the first object. Hence, if the second object has moved half the distance in a certain time, the first object must have done the same amount of motion in that time. But because the second object is – in its crucial parameters – relevantly similar to the original object, what is true of the second object should be true of the first as well. Hence, it is true that the first object has moved before.

The strategy Aristotle employs thus avoids interrupting the motion of the first object. We can deduce what is true of part of a continuous motion by employing in our deduction a relevantly similar motion. The first object's having previously been in motion is seen through the second object's having completed some motion. Aristotle shows what is true of a part of an undivided continuous motion by considering what is true of a motion that is divided and comes to an end.

I suggest that this be taken as a general model. If one wants to refer to and utter truths about undivided and potential parts, one can do this by referring to relevantly similar actual things. In the example in *Physics* VI the continuous motion (the whole motion of the object) is analogous to wholes in general, and its parts (the object having done some previous motion while still moving) is analogous to parts in general. Thus, e.g., the question how much volume the left half of an undivided object occupies can be answered by considering how much volume is occupied by a second, object that is actual and that is relevantly similar to the left half. In general, what is true about undivided parts can be shown with arguments employing relevantly similar objects. Because of the similarity, what is true of them must be true of the undivided parts as well.⁶³

4 Conclusion

Both considerations about grounding and considerations about reference show that the undetached parts are dependent on the whole. Their being is grounded in the fact that the whole

⁶³Complication: There is no general algorithm about similarity. Everything is similar to every other thing, as critics may say. If everything is similar to every other thing, to rely on a similarity-relation is useless. I think that this is wrong. Relations of similarity may work well, even if there are various different similarity relations. I believe that David Lewis is correct when he writes: 'Likewise many different relations, some more stringent and some less, some stressing some respects of comparison and others stressing others, have a claim to be called "similarity". The exact meaning of "counterpart" or "similar" is neither constant nor determinate. These words equivocally express a range of different semantic values, and the limits of the range are subject to pressures of context. Two things may be counterparts in one context, but not in another; or it may be indeterminate whether two things are counterparts. Inconstancy in representation de re is exactly what we should expect under the hypothesis that it works by comparative overall similarity of complex things. What would be hard to understand, had it been found, would be constancy' (Lewis 1986, 254). It may be even helpful (to modern-day philosophers at least) to think of the object that is compared to the part of a whole as a counterpart of the part. Of course, Aristotle does not explain modality here. But the possibility of referring to potentially existing things by considering relevantly similar actually existing objects has some obvious parallels. Thus, it comes as no surprise that Casati and Varzi use counterpart-theory to explain how one can refer to potential parts. Cf. Casati and Varzi 1999, 101ff. Interesting as it is, it is beyond the scope of this work to fledge out the similarities and dissimilarities between Aristotle's views and those put forward by Casati and Varzi.

can be divided in such and such a way. They are as possible divisions of the whole. This is why we speak of a generation once they are removed. In the same vein we must say that reference to the parts depends on reference to the whole. When we refer to the parts we are referring to them via the whole. We refer to a possible division of the whole. The same is true when the parts are actually and the whole is potentially. I have not concentrated on that case, because my interested was to explore the ramifications the thesis has for the unity of a given whole. But the same argument, I suggest, could be made for the case of actual parts vis-a-vis a potential whole.

Aristotle's remarks about mereological potentialism can thus be integrated into a systematic theory. Although his remarks are scattered throughout his works, a consistent theory can be reconstructed. And Aristotle's remarks, I think, pass the test for a good theory. His theory has explanatory power. It can explain why undivided parts are only potentially, and what it is for a part to be potentially. This explanation, in turn, is relevant for an account of the unity of substantial wholes.

Finally, Aristotle's account of the doctrine of mereological potentialism is, I believe, of general philosophical interest. For, it can help improve our understanding of our own intuitions about parts. It can explain why it is possible to refer to them by using pronouns and yet acknowledge that undivided parts do not have the same ontological status as the wholes of which they are parts.

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