Monism, Spacetime, and Aristotelian Substances

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Abstract

Schaffer offers us in the last section of "On What Grounds What" (2009) an applied illustration of his allegedly Aristotelian metaontological position. According to this illustration, Schaffer's metaontological position, supplemented with a few Aristotelian theses about substance and grounding, would converge in a view remarkably similar to his priority monism (*Philosophical Studies,* 145, 131–148, 2009b; *Philosophical Review*, 119, 31–76, 2010a), the view that there is one single fundamental substance. In this paper, I will argue against Schaffer's suggestion that priority monism represents a viable development of Aristotelian metaphysics. In particular, I will hold that the most plausible version of Schaffer's priority monism by Aristotelian standards fails to satisfy basic Aristotelian tenets about dependence, composition, change, and persistence, and suggest that this is evidence that Aristotelians are more at home with a pluralism rather than a monism about substance.

Keywords Aristotle · Substance · Priority monism · Dependence · Spacetime

1 Introduction

In his "On What Grounds What" (2009), Jonathan Schaffer develops an Aristotelian account of ontology that parts ways with the dominant Quinean stance. According to Quineanism, ontological questions are primarily questions about existence. Thus, the ontology of the Fs, let us say, amounts to determine whether the Fs exist or not. Quineans maintain that the best way of addressing existence questions is reading off the ontological commitments from our best theories of the world. And the ontological commitments of such theories would be best expressed by the existential quantifier of first-order logic. In contrast, Schaffer believes that ontological questions as thought of by Quineans are trivial questions. Whether number exists or not, whether there is a God, whether there are ordinary material objects such as tables and chairs—these are all

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questions that can be positively answered without much effort. When we do ontology, we do not argue for or against the existence of numerical entities, the existence of God, or the existence of tables and chairs. Rather, we argue about whether any of those entities are fundamental. That means that everybody who does ontology can trivially accept that there are numbers, a God, or tables and chairs, but not that they are fundamental.

Schaffer's concluding section on "On What Grounds What" offers us an applied illustration of his allegedly Aristotelian metaontological position. There, he argues that his metaontological position, together with some Aristotelian theses about substance and grounding, would converge into a monistic picture of substance. In particular, they would converge in his priority monism (2010a, b, 2013). Schaffer's priority monism asserts that "there is exactly one substance, the whole concrete cosmos" (2009a, p. 378). The crucial step in Schaffer's argument to conjoin Aristotelianism with priority monism is the way he applies his Abstraction thesis to material substances. According to the Abstraction thesis, the grounding relations are relations of abstraction (2009a, p. 378). For Schaffer, this thesis would somehow entitle us to claim that the plurality of substances we find in the ordinary world is latent or implicit in the one single fundamental substance there is, namely, the whole concrete cosmos.

The aim of this paper is twofold. First and foremost, it argues against Schaffer's idea that his priority monism could represent a viable development of Aristotelian metaphysics. Generally speaking, it stresses that to include the notion of ground in our preferred metaphysical picture of the world and to put it into use in order to articulate the difference between integrated wholes and aggregates does not suffice eo ipso for Schaffer's priority monism to be counted among Aristotelian accounts of substance. Accordingly, in the first section of the paper, I will examine Schaffer's Aristotelian approach to metaontology and substance. I will then move to discuss Schaffer's formulation of his priority monism and its alleged convergence with an Aristotelian theory of substance. In the fourth section, I will argue that even though Schaffer's one single fundamental substance displays the right sort of dependence in some cases from an Aristotelian perspective, it fails to exemplify not only the sort of dependence that one would expect to find between an integrated whole and its parts, but also some crucial features of substances as conceived by Neo-Aristotelians. In the second place, this paper pursues an exploratory aim. Very much in the vein of recent contributions from Schnieder (2020) and Calosi (2020), it attempts to explore certain theoretical possibilities which are open to Schaffer and other priority monists, particularly if they are interested in taking on board the main tenets of an Aristotelian account of substance. This in spite of concluding that an Aristotelian account of substance is in deep tension with Schaffer's monism and plausibly more at home with a pluralism rather than monism about substances.

2 Schaffer, the Neo-Aristotelian

Schaffer's Neo-Aristotelianism can be traced to his commitment to at least the following three theses:

(i)   Metaphysics is about what grounds what.

(ii)   Substances are the basic, ultimate, and fundamental unit of being.
       (iii)Wholes differ from mere aggregates in that they are prior to their parts (2009a, pp. 350–351, 370).

2.1 Grounding and the Task of Metaphysics

Loosely defined, metaontology is the part of philosophy that deals with the nature of existence questions. Schaffer's "On What Grounds What" (2009) develops what he calls an Aristotelian account of ontology. At the heart of this account, we find the claim that the task of metaphysics is to establish what grounds what (2009a, p. 351). This view is in stark contrast to the dominant Quinean approach to the matter. Quineanism is the metaontological view that derives from Quine's views on quantification, ontological commitment, and existence (1953a, p. 13; 1953b, p. 103). According to Quineanism, expressions such as the verb "exist," the verb phrase "there is," or the quantifier "some" or "something" should be treated as expressing ontological commitment. Thus, in a basic and straightforward case, "Some of Fs are Gs" is taken as another way of saying "There exist Fs which are Gs." Quine and the Quinean tradition understand this sort of commitment as a demand deriving from the truth of our theories. We are ontologically committed to the entities over which the variables of our theories range over in order to make the statements of such theory true.

The notion of grounding is commonly introduced by Schaffer and others as a type of explanatory relation that provides us with distinctive non-causal metaphysical explanations about the world. Popular examples that would illustrate the work this notion allegedly does are claims such as "The singleton Socrates exists in virtue of the existence of Socrates," "An act is lovable by the gods because of its being pious," and "The table exists due to the existence of the parts that compose it." Grounding relations are considered to be necessary and constitute a strict partial order in virtue of the fact of being irreflexive, asymmetric, and transitive. However, if we are to have an adequate understanding of the account of grounding defended by Schaffer, it is necessary to distinguish between the notion of grounding as an explanatory relation and as a non-explanatory relation that backs the "grounding" explanations we may invoke (Bliss & Torgdon, 2014).[1] Philosophers who have defended the former notion of grounding would regiment grounding talk with a non-truth functional sentential connective (Correia, 2010; Fine, 2012). Defenders of this account of grounding remain neutral about the existence of entities, such as facts or propositions, that would be connected when we invoke this notion in our explanations. On the other hand, philosophers who have endorsed the latter notion would regiment grounding talk by means of a relational predicate that picks up the grounding relation. Facts, propositions, and things have been postulated as *relata* of this relation (Schaffer 2009; Rosen, 2010; Audi, 2012). In the case of Schaffer, what we find is a rather liberal attitude towards the categories of entities that might feature as the *relata* of a grounding relation, without

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[1] A further distinction that might be convenient to bear in mind when it comes to grounding is whether grounding is a unitary notion or rather captures a number of dependence relations that get to be designated by this broader notion. Given that subsequent discussion in Section 4 will be couched in terms of different notions of dependence, I will simply flag this issue here and move on (though see footnote 2 for further background on Schaffer's stance on the matter).

even being necessary for the categories of entities involved in such relation coincide (2009a, pp. 375-376).[2]

2.2 Fundamentality of Substance

Schaffer believes that on Aristotle's view, metaphysics is the discipline that studies fundamental entities and what depends on them by focusing on the study of substances and their modes and kinds:

> It is necessary for one science to consider being qua being, and the attributes which belong to it qua being, and the same science will consider not only substances but also their attributes, both those above named and what is prior and posterior, genus and species, whole and part, and the other things of this sort (*Metaph*. 1005a14–17).[3]

Hence, the Aristotelian task of metaphysics for Schaffer of finding out what grounds what (2009a, p. 351). Aristotelians begin from a hierarchical view of reality ordered by priority in nature. The primary entities form what one might call the sparse structure of being, while the grounding relations generate an abundant superstructure of posterior entities dependent on these sparse primary entities. This abundant superstructure of posterior entities obtains in virtue of what Schaffer calls the permissive nature of grounding. Grounding allows us to believe in the abundant existence of non-fundamental entities as long as we keep the inventory of fundamental entities in check. This in turn reveals that metaphysicians would be not so much into the business of determining what exists (abstract entities, composites objects, mental events) as in the business of determining how does something exist (2009a, p. 348). It is within this framework of existence and dependence, Schaffer argues, that we should read the following remark from Aristotle on the ontological priority of substance:

> So if the primary substances did not exist it would be impossible for any of the other things to exist (*Cat*. 2b6–7).[4]

If the task of metaphysics in Schaffer's Aristotelian picture then is to find out which entities are fundamental and thus not grounded in anything else, the method that metaphysicians shall follow to accomplish this task would be one of "diagnostics for what is fundamental, together with diagnostics for grounding" (2009a, p. 351). Schaffer finds in *Metaph*. 1005a14–17, quoted above, an extremely congenial approach. Notice, in this regard, the stark contrast with the Quinean picture described in the previous

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[2] I agree with both Steinberg (2015) and Calosi (2020) that Schaffer's understanding of the notion of grounding is a sui generis one. Firstly, he equates the grounding relation described above with dependence, leaving us with one notion of fundamentality. As a consequence of that, he somehow transfers the category neutrality that is often associated with the notion of dependence to the grounding relation. However, as Calosi has argued (2020), there are important reasons why a priority monist such as Schaffer might want to keep them apart. When I come back in Section 4 to some of these issues, I will regiment the discussion for the sake of clarity in terms of different notions of dependence.

[3] Here and in the following quotes from Aristotle, I follow Barnes's translation (1984) with some occasional modifications of my own.

[4] See also *Metaph*. 1019a2–4.

section. According to this picture, the main task of metaphysics is to determine what exists and the best and most reliable method that we could avail ourselves to accomplish this task is to read off the ontological commitments from our best theory, once such theory is regimented in the canonical notation of first-order logic. One upshot of this, as I also already noticed, is that on Schaffer's Aristotelian picture ontological questions as thought of by Quineans are trivial questions that could be straightforwardly answered. Rather, the ontological questions that would really raise interesting ontological issues are the ones which are directed at fundamental entities.

2.3 Integrated Wholes

Schaffer puts the notion of grounding to further use in order to capture a mereological distinction missing from classical extensional mereology (CEM) between an integrated whole and a mere aggregate (2009a, p. 374).[5] For Schaffer, an integrated whole exhibits genuine unity, whereas mere aggregates are often random assemblages of parts. Here is Aristotle in an often quoted passage (also by Schaffer) that puts forward the difference:

> that which is compounded out of something so that the whole is one—not like a heap, however, but like a syllable—the syllable is not its elements, ba is not the same as b and a, nor is flesh fire and earth; for when they are dissolved the wholes, i.e. the flesh and the syllable, no longer exist, but the elements of the syllable exist, and so do fire and earth. The syllable, then, is something—not only its elements (the vowel and the consonant) but also something else; and the flesh is not only fire and earth or the hot and the cold, but also something else (*Metaph.* 1041b11–5).

For one, Schaffer believes that the distinction between integrated wholes and mere aggregates is found in common sense. We intuitively distinguish between persons, trees, chairs, and circles, on the one hand, and heaps and sets of things, on the other. The latter sort of entity seems to be nothing over and above the sum of its parts, whereas the latter seems to be something prior other than the sum of its components. What the contrast between integrated wholes and aggregate of objects reveals then is the priority of the whole over its parts when there is something more than an addition relation at stake (2010a, p. 347). The paradigm case of integrated wholes for Aristotelians are organisms and their organs. Organs are defined for Schaffer by their

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[5] One should not assume here that Schaffer is denying one or some of the core axioms of CEM, such as Extensionality, but rather the metaphysically more robust thesis of Composition as Identity. In fact, Schaffer elsewhere explicitly does so (2010a, p. 38), at least as the view is formulated by Baxter (1988a, b). Moreover, Schaffer embraces elsewhere (2009b, p. 135; 2010a, p. 34) unrestricted composition, the mereological principle according to which for any plurality of things, there is a fusion of them. Unrestricted composition is instrumental to establishing the existence of the cosmos as a maximal concrete object, a central tenet of Schaffer's monistic view. Also, unrestricted composition for material objects follows from supersubstantivalism—which Schaffer endorses (2009b)—and unrestricted composition for spacetime regions. That would certainly be a strange view to uphold if he were not also committed to extensionality. And lastly, it might just be, as an anonymous referee pointed out to me, that while still upholding CEM, Schaffer does not believe that it could provide us with a satisfactory account of integrated wholes.

functional integration within the organism. He finds support to this approach in the following passage from Aristotle:

> And further if the parts are prior to the whole, and the acute angle is a part of the right angle and the finger a part of the animal, the acute angle will be prior to the right angle and the finger to the man. But the latter are thought to be prior; for in formula the parts are explained by reference to them, and in virtue also of their power of existing apart from the parts the wholes are prior (*Metaph*. 1034b31–3).

This intuitive distinction between integrated wholes and mere aggregates is expressed by Schaffer in a more perspicuous way utilizing his notion of grounding that I presented above:

> Integrated whole: x is an integrated whole $=_{df}$ x grounds each of its proper parts.
> Mere aggregate: x is a mere aggregate $=_{df}$ each of x's proper parts ground x (2009a, p. 374).[6]

From this pair of definitions, Schaffer goes on to define a notion of interdependence between entities:

> Interdependence: x and y are interdependent $=_{df}$ there is an integrated whole of which x and y are both proper parts (2009a, p. 374).

Before we move to examine Schaffer's Aristotelian monism in the coming section, it is important to make three caveats about Schaffer's view on grounding and parthood the relation between both as it will turn out to be useful later in our argument. The first one is that for Schaffer grounding relations are relations of abstraction. The priority that the entities that serve as grounds have over grounded entities leads Schaffer to assert that the latter are only abstracted aspects of the former: "the concrete whole is always prior in nature to the abstracted aspects" (2009a, p. 377). This perhaps could be another way of stating Schaffer's ontological monism or his intuition that grounded entities must be already latent within their grounds (2009a, pp. 377-378). The second one is that if grounding plays the key role that Schaffer believes it plays when it comes to understand integrated wholes, then the relation between a whole and its parts should be understood as a particular case of the more general grounding scheme. The third one is that if we are going to think about material substances as integrated, no substance can have substantial proper parts, that is, no substance can have other substances as proper parts. Hence, the claim from Aristotle that "that a substance cannot consist of substances present in it actually (for things that are thus actually two are never actually one […])" (*Metaph*. 1039a3–1039a13). Substances, according to Schaffer, must be a unity, and so anything consisting of two substances must be "actually two" and "never actually one" (2010a, p. 41).

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[6] Interestingly, Schaffer claims that this set of definition has the correct result that if the universe is an integrated whole, then all its proper parts would turn out interdependent.

3 Schaffer's Road to Aristotelian Priority Monism

Priority monism is the thesis that "the world" or "the cosmos" is the single fundamental concrete object, upon which all other concrete objects, which are parts of this fundament, depend for their existence. The cosmos has concrete objects as its proper parts, but it is not identical nor posterior to the plurality of them. In Schaffer's words,

> The monist holds that the whole is prior to its parts, and thus views the cosmos as fundamental, with metaphysical explanation dangling downward from the One (2010a, p. 31).

Priority monism needs to be distinguished from existence monism, the view that there is only one single existing object. Existence monists deny there is such thing as priority relations between the one fundamentally existing things and its parts, for there are no parts to be grounded in the whole or cosmos.

Let me now introduce Schaffer's monistic thesis via the semi-formalization of it offered by Schaffer himself. To begin with, allow the following predicates along with the parthood predicate that it was introduced in the previous section:

Dxy = x depends on y
u = the cosmos.

"D" could be taken to pick up the grounding dependence relation also introduced above. "U," in turn, corresponds to the cosmos, which for Schaffer amounts to a maximal actual concrete object. Schaffer makes it clear that his monist project is concerned with a cosmos only composed of concrete objects (2010a, p. 33). So, if we allow "C" to stand for the predicate "is concrete" and accept with Schaffer that every concrete object is a part of the cosmos, then with our parthood predicate we get:

$Cx = Pxu.$

This enables us, once we introduce "B" as a predicate to designate basicness, to formulate the thesis that the cosmos is basic thus:

$Bx = Cx \ \& \ \neg\exists(y) \ (Cy \ \& \ Dxy)$ (2010a, p. 38).

And that, lastly, allows us to give a formal statement of Schaffer's priority monism:

Priority Monism $=_{df} (\exists!x) \ Bx \ \& \ Bu$ (2010a, p. 42).

Therefore, priority monism would assert that there exists a single object that is basic and that such basic object is the cosmos. Of course, we know at this point that in Schaffer's view to say that only one object is basic does not preclude the existence of non-basic objects. According to Schaffer, in addition to basic objects, there exist derivative (or non-fundamental) objects. These objects are parts of the monistic whole, and include things like tables, chairs, and other familiar macroscopic objects (2010a, p. 33).

How do we link up this resulting monistic picture with Schaffer's own Aristotelian picture about substances that we discussed in Section 3? A plausible starting point may be Schaffer's notion of minimal completeness, for Schaffer claims that substances are minimally complete entities (2009a, p. 377). Let us look at the relevant definitions offered by Schaffer to this effect:

> A set S of entities at a world w is complete for w iff S serves to characterize w, by providing a supervenience base for w.

So then we get for the minimal case of completeness that

> S is minimally complete for w iff (i) S is complete for w, and (ii) no proper subset of S is complete for w (2009a, p. 377).

That basic objects, i.e., substances, are minimally complete implies that there cannot be any proper sub-plurality of them that is complete. This is another way of expressing Schaffer's and Aristotle's idea that substances cannot enter into whole-to-part relations with other substances. Given that substances are the basic and most fundamental components for Aristotelians and wholes prior to their parts, no substance could be a proper part of another substance.

Two further features fundamental entities must satisfy are to be metaphysically general and empirically specifiable (2009a, pp. 378). Metaphysical generality demands that fundamental substances have a form that fits all metaphysical possibilities, that is, that the ways the substances could be are just the ways the world could be. No possibility could remain uncaptured by the properties that substances could have. On the other hand, empirical specifiability demands that fundamental substances have a content informed by fundamental physics. Content is empirically specifiable if and only if these features fit those features found in fundamental inventory of properties that physics provides.

Finally, consider the crucial Abstraction thesis, which I already informally anticipated in the previous section when characterizing Schaffer's theory of grounding:

Abstraction: The grounding relations are relations of abstraction (2009a, p. 378).

We saw that grounded or derivative entities, in Schaffer's neo-Aristotelian picture, are supposed to be an ontological free lunch and count as no further addition to the inventory of fundamental entities. Non-fundamental entities, we are told by Schaffer, must be already latent within the substances. What grounding relations allow then is to separate aspects of reality that were implicitly existing in substances, which constitute the set of basic entities. We somehow abstract derivative entities via grounding relations that were somehow contained in their grounds. In this regard, grounding relations also account for the fact that when it comes to substantial ontological question, what matters is not so much the abundant superstructure of derivative entities, but the sparse primary entities on which derivative entities depend.

Schaffer believes that this allegedly Aristotelian diagnostic about the nature of substances converges upon converges with his priority monism (2009a, p. 378). The relation here, nonetheless, does not seem to be one of entailment, as Schaffer asserts that Aristotelian priority monism is only one way in which a neo-Aristotelian program about ontology might be developed (2009a, p. 379). Convergence here should be taken

to mean then that his Aristotelian approach to issues on substance, grounding, and parthood is compatible and instrumental to his priority monism. Therefore, by means of abstraction and the permissiveness of grounding, Schaffer holds that we get the priority monistic picture described at the beginning of this section, a picture that would be highly congenial to the Aristotelian take on substance, priority, and composition. Within this picture, according to Schaffer, we would find a complete set of substances that provide a supervenience basis for our world, thus satisfying completeness (2009a, p. 378). This set, given Schaffer's commitments, would also be minimally complete, metaphysically general, and empirically specifiable. And if we allow with Schaffer for the cosmos to be arbitrarily decomposed into parts, that is, if we allow for universal decomposition, then the entirety of the actual concrete mereological hierarchy of thick particulars could be generated (2009a, pp. 378-379).

4 Do the Parts of This Whole Really Fit Together?

The central question that Neo-Aristotelians should address at this point is whether Schaffer's one fundamental object or cosmos could really be an Aristotelian substance. Of course, details of Schaffer's position on matters of substance, grounding, or parthood could be disputed, but the substantial question here for Neo-Aristotelians is precisely whether priority monism could be counted as one of the possible realizations of an Aristotelian metaphysical program of substance. Given this general concern, a natural place to start is examining Schaffer's categorization of the cosmos as the only existing fundamental substance.

4.1 The Cosmos as the Only Existing Fundamental Substance

One line of criticism to this assertion has been advanced by Jonathan Lowe. According to Lowe, given our natural and intuitive views about objecthood, it is difficult to see that the cosmos is the kind of thing that should qualify as an object, given that objects are not mere aggregates of their components but rather display some kind of tighter unity (2012, p. 93). This concern could be articulated in more precise terms if we introduce a pair of dependence notions, developed by Thako and Lowe (2020) among others, and use them in turn to understand the relation that holds between wholes, aggregates, and their parts. What these types of dependence might reveal is that Schaffer's cosmos is nothing more than a maximal aggregate of concrete objects, thus somewhat posterior and dependent on its parts.

However, a caveat is in order before we introduce this pair of notions. As we saw in Section 2, Schaffer does not seem to distinguish at all between the notion of grounding on the one hand, and the notions of fundamentality and ontological dependence on the other. For instance, he claims that substances are fundamental entities, meaning with this that they are not grounded nor derivative from anything else (2009b, p. 131), or that what we take to be fundamental or derivative can be defined indistinctly in terms of grounding, ontological dependence, or priority in nature (2009a, p. 373). Schnieder regards Schafer's view as a strong unificatory one when it comes to dealing with ontological dependence and grounding (2020, p. 201) because he would take the latter notion to be merely the converse of the former. Yet, as Schnieder and a number of

authors in the recent literature have shown, such unification faces serious problems (Fine, 2012; Calosi, 2020; Schnieder 2020). I accept then that Schaffer might consider controversial to introduce this pair of dependence notions (and yet a third one in Section 4.3!) on top of his unitary grounding-cum-dependence notion, even though we find plenty of good reason in Calosi (2020, pp. 11-18) and Schnieder (2020, pp. 202-209) for priority monists to abandon such assumption.

Be that as it may, let us at last introduce this pair of dependence notions. The first one of the pair is rigid existential dependence. According to it,

> x depends for its existence upon y = $_{df}$ (i) necessarily, x exists only if y exists and (ii) it is *not* the case that, necessarily, y exists only if x exists.[7]

Rigid existential dependence then entails the strict implication of the existence of y (or the ys) by the existence of x. In our case, if the cosmos is rigidly existentially dependent on its parts, the existence of the cosmos would necessarily entail the existence of the parts that compose the cosmos itself. But if Schaffer's cosmos is supposed to qualify as an Aristotelian substance, this type of dependence of the whole in question on its parts seems inadmissible, since it should be possible for the cosmos to actually have other parts than the ones it actually has. The relation between the former and the latter would be similar in nature to the one between a set and its members, or a heap of rocks and the individual rocks that compose it, but not like the one between an integrated whole and its parts.

The second type of dependence is identity dependence (Thako and Lowe 2020). According to this second sort of dependence:

> x depends for its identity upon y = $_{df}$ There is a relation "R" such that it is part of the essence of x that x is *related by R* to y.

In the case of the cosmos, the concern that Lowe raises after considering this sort of dependence is that the identity of the cosmos would be dependent on its parts, for the question "Which object the cosmos is?" is answered once we determined which parts compose it. Again, Schaffer's cosmos would turn out to be similar in nature to an aggregate of things or a set: once we fix the parts that compose the cosmos, the cosmos would be identical to that sum of parts. In contrast, the identity of integrated wholes such as Aristotelian substances is not dependent on the parts that compose the whole. If anything, dependence should run precisely in the opposite direction, as Schaffer himself admits (2009a, p. 133).

Now, although Lowe's criticism enjoys some plausibility, one might argue with some interpretative charity that Schaffer's cosmos could at least be prima facie considered as an Aristotelian substance. To appreciate this, let us focus on the answer Schaffer could give to the second objection advanced by Lowe against the substantial

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[7] Notice that on the version I introduce here of this dependence relation not only do we exclude cases where such relation might hold symmetrically between two objects (think, for instance, on the typical Socrates and singleton Socrates Fine cases), but also any case in which we might want to say an object depends on itself.

nature of his cosmos.[8] This objection draws on the definition of concreteness that underlies Schaffer's account of the cosmos. Recall that Schaffer defines the cosmos as the maximal actual concrete object. And uses the predicate "C" to express the status of being a concrete object, via the parthood relation ("P") in which any given concrete object stands to the cosmos (u) (2010a, pp. 33-38). According to Schaffer's definition, x would be a concrete object if and only if x is a part of the cosmos. But the obvious problem here is that Schaffer already told us that the cosmos is the maximal actual concrete object, making this definition far from illuminating and actually circular.

In defense of Schaffer, Tallant suggests that one way of escaping circularity here is adopting Schaffer's own suggestion of treating spacetime as the one fundamental existing substance that the Schafferian priority monist claims to exist (Tallant 2015, pp. 3103–3105).[9] According to Schaffer:

> Spacetime is substance enough. There is no need for the dualism of the contained and the container (or for fundamental containment relations). When God makes the world, she need only create spacetime. Then she can pin the fundamental properties directly to spacetime (2009b, p. 133).

If as a criterion of concreteness we stipulate, as many in fact do, that for an object to be concrete such object must exist within spacetime, Tallant notes that there is a natural response out there for the priority monist. Material substances will be concrete if they are located somewhere within spacetime. The fact that Schaffer identifies material objects with the spacetime regions they occupy should not be a problem for the proposed criterion of concreteness: given (i) that location is normally treated as a reflexive relation when it holds between regions and (ii) that material substances in this picture are identical to the regions that contain them, every material substance will be trivially located at itself.[10] Thus, we seem to have a way of escaping from the objection of concreteness as long as we also adopt Schaffer's view that objects are not a different thing from the spatiotemporal regions they are located at. Here is Schaffer once more on this issue:

> I am presupposing that spacetime regions are one sort of substance. I am asking whether or not material objects should be thought of as a second sort of substance. I will be defending the monistic view. In particular, I will be defending

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[8] Lowe expands his initial criticism in more than two directions (2012). He claims that Schaffer's priority monism controversially assumes universalism and that Schaffer's notion of the cosmos is simply too vague to be the proper object of study of any scientific discipline. However, I shall not be concerned with these objections here, but rather discuss in length the two objections presented in this section.

[9] For Schaffer's own proposal, see Schaffer (2009b).

[10] I am assuming that the location relation referred to here is the exact location relation developed by Varzi and Casati (1999), Gilmore (2006, 2007), and McDaniel (2007), though following Gilmore and McDaniel in not assuming that exact location entails functionality, the principle that an object cannot have more than one exact location. A further caveat regarding the reflexivity of exact location is also required. Our location relation is a relation that either relates objects to regions or regions to regions, but not objects to objects. Assuming that, to claim that exact location is a reflexive relation cannot imply that every object is exactly located at itself. Rather, it implies only that every region is located at itself. Given that in Schafer's view objects are identical to the regions that contained, our location relation will be a relation that connects regions to regions.

the identity view, which is the version of monism that identifies every spacetime region with a material object. On this view there is no distinction between the container and the contained (2009b, p. 133).

We are now in a position to address Lowe's initial objection against the alleged priority of Schaffer's cosmos over its parts. If objects are to be identified with the spacetime regions they occupy, then every substance that composes this maximal concrete actual object could be treated as a part of this integrated whole. This integrated whole, according to Schaffer, would have topological and geometrical features that cannot be obtained if we merely aggregate the parts that compose spacetime (2009b, p. 136). Moreover, it would seem that the identity of each of the parts that compose this maximal integrated whole would be dependent on the whole itself, given that spacetime regions would have to be individuated by the spatiotemporal relations in which they stand to other regions. Thus, according to Schaffer's picture, the cosmos would not be rigid existentially dependent on its part nor identity dependent on them. Here is Schaffer expanding on these two types of dependence between the cosmos and its parts:

> To be a part of spacetime is to have such topological and geometrical features, and parts of spacetime have these constitutive features in virtue of their embedding in the whole. The parts thus depend for their natures on the whole. […] Thus the parts of spacetime exist as individuals in virtue of their position within the whole. The parts thus depend for their identities on the whole.
> Given the priority of the whole for spacetime, and the monistic identification of material objects with spacetime regions, the priority of the whole for material objects follows immediately (2009b, p. 136).

4.2 The Non-Identity of an Aristotelian Substance with Its Matter

However, one might legitimately wonder whether Tallant's suggested solution to address the concreteness objection leaves any room to keep defending Schaffer's priority monism as a viable development of Neo-Aristotelian metaphysics. It is true that Schaffer himself offers several independent reasons to motivate his monistic substantivalism, the view as we saw above (i) that spacetime is a substance and (ii) that material substances are identical to the spacetime regions they occupy (2009b, pp. 137-144). This fact makes the appeal to monistic substantivalism in the dialectic between the priority monist and the Aristotelian a non ad hoc move. But the non ad hoc nature of this reply should not distract us from our main goal, regardless of the justification Schaffer might want to offer in its favor. Neo-Aristotelians commonly accept the view that material substances are not identical to the matter that constitutes them, let alone the regions they are located at.[11] On the other hand, the sort of monistic substantivalism that Schaffer is committed to not only entails the denial of the distinction between material

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[11] See Fine Lowe (1998), Fine (2003, 2006), and Koslicki (2008) for some contemporary examples.

substances and their matter, but also the distinction between spacetime regions and whatever occupies them. Schaffer's view then does not represent then a negligible departure from Aristotelianism here.

Regardless of the view we adopt about the substantial nature of spacetime, neo-Aristotelians have argued that material substances possess (i) a unifying and structuring principle for the matter from which material objects are made of and (ii) the matter that is structured and organized by this principle.[12] This common stance among neo-Aristotelians gives way to a contrast between hylomorphic accounts of material objects and accounts that consider that material objects are nothing over and above the sum of their material parts. Hylomorphic accounts provide us with a principle of restricted composition for material objects. Given that material objects are structured compounds, their material parts would only compose a whole when appropriately related by the unifying formal principle that hylomorphic theories postulate and when belonging to a certain kind. In Section 2, we saw that Schaffer, at least at some level, takes himself to be on the side of neo-Aristotelians when he claims that integrated wholes are more fundamental and prior to their parts, even quoting Aristotle's *Metaphysics* Z 17 to this effect (*Metaph.* 1041b11–5).

Furthermore, if the only existing material substance is identical to spacetime, it will not persist through time in the way Aristotelians think about this phenomenon and will not be a proper subject of change, whether it be mereological or in its intrinsic properties. The natural way contemporary Aristotelians have approached to the problem of persistence and change is holding, on the hand, a three-dimensionalist view on persistence, that is, the view that material substances do not extend through time but only through space, and on the other, that the persistence of the very same material substance through time will be guaranteed as long as such material substance possesses the same structuring principle at those times.[13] In contrast, our only substance, in Schaffer's account, is confined to one single location in space and time—the whole of spacetime or itself—and does not undergo any change in its properties or composition. Notice, in this regard, how startling is the difference between this latter picture and what Aristotle says regarding a substance's matter and the role the latter has in the constant changes substances undergo:

> Sensible substance is changeable. Now if change proceeds from opposites or from intermediate points, and not from all opposites […] but from the contrary, there must be something underlying which changes into the contrary state; for the contraries do not change.

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[12] See again Fine (1994, 2008, 2010), Johnston (2006), Koslicki (2008, 2013), Brower (2010), and Jaworski (2016) for a few notorious recent examples. One particularly useful place within Aristotle's corpus to find an attempt where this distinction ifs fleshed out in detail is *Metaph.* Z 7-9. In *Metaph.* Z 8, for instance, Aristotle claims the following:

> It is obvious then from what has been said that the thing, in the sense of form or substance, is not produced, but the concrete thing which gets its name from this is produced, and that in everything which comes to be matter is present, and one part of the thing is matter and the other form. (*Metaph.* 1033b17-9)

[13] See specifically Fine (2008), Koslicki (2008), and Sattig (2015).

Further, something persists, but the contrary does not persist; there is, then, some third thing besides the contraries, viz. the matter (*Metaph.* 1069b6-9).[14]

Now, perhaps it is possible to take this upshot not as a conclusive proof that Schaffer's priority monism is not in a robust sense Aristotelian. After all, it is no surprise here that the most suitable account of change available to Schaffer here is a four-dimensionalist or perdurantist one. Even if he has sometime stated that on his view the cosmos is treated as an enduring object, that is, an object that is able to survive changes and remain numerically identical throughout its existence (2013, p. 74), it makes a more charitable reading of the view to defer to Schaffer's early endorsement of four-dimensionalism and its corresponding account of change (2009b, p. 135). According to this account, a material object is said to change if and only if that temporal parts that compose instantiate incompatible properties at different times. The cosmos then could be said to change in virtue of the different and to some extent incompatible arrangements of intrinsic qualities at different times. This caveat would at least allow the Schafferian monist to talk about the cosmos as a changing substance or a subject of change, even though her underlying account of change is at odds with the standard Aristotelian picture.

Besides, one could even point out on behalf of Schaffer that there is in fact some disagreement among proponents of an Aristotelian account of substance as to the persistence account that defenders of such view ought to adopt. Jeffrey Brower (2010), for instance, has argued that an Aristotelian account of change cannot be easily accommodated at neither side of divide between endurantists' and perdurantists' accounts of change. For Brower, the primary bearers of intrinsic properties are hylomorphic compounds such as Socrates seated or Socrates-at-time t_1. Such compounds would be strikingly similar to a perdurantist's temporal parts, but on the other hand would have as components persisting material objects like Socrates. This, in turn, could go on to show that there is not such a straight path from an Aristotelian account of substance to three-dimensionalism, as one could have thought.

To sum up and move on to the next section, Schaffer's commitment to four-dimensionalism taken by itself should probably not disqualify his monistic account as fundamentally not Aristotelian. What I expect to show in the next and final section is that taken together with the dependence relations obtained between the cosmos and its parts, the case for the allegedly Aristotelian nature of Schaffer's priority monism looks far less convincing.

4.3 The Dependence of a Whole on Its Parts

The relation between parts and wholes envisaged by Aristotle (and Aristotelians in general) is a complicated matter and probably more complicated than what we saw Schaffer tells us in section 3. Part of the complication lies in the fact that Aristotle identifies senses in which parts could be considered prior to the wholes they belong. Of course, Schaffer would be right in asserting that integrated wholes are neither rigid existentially dependent nor identity dependent on their parts. But there are senses in

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[14] See also *Physics* 190a32-37) for another passage where Aristotle makes this specific point and, more generally, *Physics* A 6-7.

which it seems legitimate within an Aristotelian metaphysical framework to claim that a whole is dependent on its parts. Take, for instance, the following passages from Aristotle's *Metaph.* Δ 11 and Z 10:

> 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.* 1019a8-10).
>
> When any one asks whether the right angle and the circle and the animal are prior to that into which they are divided and of which they consist, i.e. the parts, we must meet the inquiry by saying that the question cannot be answered simply. […] The whole in one sense must be called posterior to the parts, i.e. to the parts included in the formula and to the parts of the individual right angle (for both the material right angle which is made of bronze, and that which is formed by individual lines, are posterior to their parts) (*Metaph.* 1036a13-6, 19-22).

It is not my aim here to elucidate how many senses of priority between parts and wholes Aristotle identified in this and other related passages.[15] Rather, I would like to instead introduce yet a third type of dependence that for Lowe obtains between integrated wholes and their parts. This type of dependence, which Lowe labels generic existential dependence, seems to be congenial to some of the senses in which Aristotle thinks a whole might be dependent on its parts. According to it:

> x depends for its existence upon Fs $=_{df}$ It is part of the essence of x that x exists only if some F exists.[16]

One easy way in which we can appreciate the sort of dependence that generic existential dependence tries to capture is following Lowe's example of a living organism, an often invoked instance of an Aristotelian substance (2012). Assuming that at the biological level a living organism will be composed of cells, one could say that a given living organism will generically depend upon its cells for its existence, as it can certainly survive the loss of some of them, but cannot survive the loss of all of its cells simpliciter. Since a living organism is not identical or existentially posterior to the cells that compose it at a time, it is possible for that organism to replace some of the cells it has from one time to another.[17]

In trying to elucidate the features of the ontological dependence relation between spacetime and its parts, Tallant argues that the latter cannot be a relation of generic

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[15] Though see Wedin (2000, pp. 300-314) for an attempt in that direction.

[16] The generic existential dependence relation that I am introducing here from Thako and Lowe (2020) is not strictly necessary for the argument I pursue in the rest of the section, which in fact only requires the following modal version of this relation:

  x depends for its existence upon Fs $=_{df}$ Necessarily, x exists only if some F exist.

  I stick nonetheless to its more fine-grained essentialist version to somehow mirror the essentialist identity dependence relation introduced before.

[17] It is interesting to notice that Aristotle seems to even go beyond what he claims *Metaph.* 1036a14-25 in *De Partibus Animalium* 670a23-27, where he suggests that there is a hierarchy in the dependence between the constituents of a living organism and the organism itself. Thus, it turns out, according to Aristotle, that we might regard the heart and the liver as essential constituents of animals over, let us say, a leg, an ear, or even an eye.

existential dependence (2015, p. 3111). Yet Tallant does not consider either the possibility that such a notion of ontological dependence could be operating between spacetime regions and the whole of spacetime, or the consequences that this possibility might have for Schaffer's account of substance. It is difficult to conceive, nonetheless, how the notion of generic existential dependence could fit into this picture. For one, the cosmos cannot be thought of as a persisting substratum that changes in its mereological composition from one time to another. If anything, spacetime should be regarded as a four-dimensional entity that exhibits different properties in virtue of the properties that the regions that compose it instantiate, although it is not clear whether spacetime would remain the same entity if some of the regions that compose it had different properties or were not part of spacetime at all. Accordingly, only a four-dimensionalist or replacement account of persistence and change would be available to Schaffer here—as he himself admits (2009b, p. 135)—but certainly not a substratum account along the lines the one sketched by Aristotle above in *Metaph.* 1033b17-9.

Notice, in contrast, that the sort of priority the Aristotelian substances have over its parts allow them to depend on the latter, in the sense stated above, but without being either rigidly existentially dependent on them nor identity dependent on them. In other words, at each time at which they exist, they need to have a mereological structure, but such structure can vary across time. The latter point could be expressed in an even more pressing way against Schaffer's alleged Aristotelian priority monism. Consider the following example presented by Steinberg against this view (Steinberg 2015, pp. 2028-2029). Suppose there is a living organism "o" who crucially depends for its existence on one of its parts, let us say its brain. Let us further stipulate that there is a duplicate "d" of o, which might have had different conditions of origin, or other external relations than o, but does not differ on its parts from o. Presumably, given that the dependence relation between o and its parts is an intrinsic feature of o, d would also display the same dependence relations. It would seem then that in any world "w" where it is possible for d to be the only fundamentally existing object, d will depend at w on one of its parts, namely, its duplicate brain, for d cannot continue to exist if it is deprived of its brain. But given the notion of dependence that is at work on Schaffer's account of integrated wholes, it is not admissible from the perspective of the priority monist to claim that there is such a dependence between d and the duplicate brain.[18]

Therefore, it seems that priority monism, at least as thought of by Schaffer, does not constitute a viable development of an Aristotelian metaphysics of substance. The

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[18] Calosi (2020) offers a reply to this counter-example on behalf of priority monism. Steinberg claims that the example above entails the principle of isolated duplicates, according to which:

> For any composite object o—with parts p_1; . . .; p_n—that exists at @, there is a possible world w such that the only concrete objects that exist at w are o's duplicate, o*, and the duplicates of o's parts, $p*_1$; . . .; $p*_n$. (2015, p. 2029).

However, Calosi rightly points out that it is not obvious why priority monists should accept such principle. The best reason to my mind offered by Calosi is that the Principle of Isolated Duplicates is a principle that is part and parcel with Humean metaphysical frameworks that allow for free recombinability. But priority monists (and also Aristotelians) have principled reasons to reject free modal recombination. Of course, this is not a conclusive argument to discard the Principle of Isolated Duplicates, which seems to have an appeal regardless of its Humean ties—but it certainly puts the weight of Steinberg's objection into perspective.

Schafferian priority monist has her best shot when she identifies the cosmos, or the only existing fundamental substance, with spacetime. In that way, she can address concerns about the unity and identity of the cosmos on the one hand, and the problem from concreteness, on the other. Nevertheless, even if we grant that this move gives a correct analysis when it comes to establish whether there is a rigid existential dependence or an identity dependence between the whole of the cosmos and its parts, it is in deep tension with an Aristotelian account of the relation between substances and their material parts and an Aristotelian account of change and persistence through time.

5 Concluding Remarks

As one could probably anticipate, the arguments offered throughout Section 4 do not undermine in any obvious way Schaffer's priority monism. For all we know, it might as well be that Schaffer's preferred metaphysical system captures the best available theoretical option about substance among all the contemporary competitors. Moreover, perhaps one might even question the alleged commitment of the priority monist to the identity of the cosmos with the whole of spacetime , as it was argued in Section 4.1, and rather try to motivate the sort of unity the cosmos ought to display from *phenomena* such as quantum entanglement or the dependence of causal powers of concrete particulars on the causal powers of the cosmos, as Schaffer is perfectly aware of. It also worth noticing that in spite of the arguments offered in the previous section against Aristotelian priority monism, a substantial part of the Aristotelian developments incorporated in Schaffer's metaphysics of concrete objects should be, by and large, welcomed by Neo-Aristotelians. There is nothing either in the idea of grounding, or the fundamental category of substance, or the notion of integrated whole that logically commits the Aristotelian to priority monism. Nonetheless, I hope to have shown that the alleged convergence that Schaffer sees between an Aristotelian metaphysics of substance and his priority monism is far from obvious or even plausible, particularly when we closely examine the shortcomings it has in the resulting account about substance.

Declarations

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