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9

Substance, Independence, and Unity

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1 Introduction

Hylomorphism is the position popular among neo-Aristotelian metaphysicians according to which unified wholes (such as presumably organisms) are in some sense compounds of matter (hylē) and form (morphē). Neo-Aristotelians also often find themselves drawn to an account of substancehood which centers on the idea that the substances are just those entities which are ontologically independent, according to some preferred notion of ontological independence. But what this preferred notion of ontological independence is in terms of which a successful criterion of substancehood can be formulated has been a difficult and controversial question.[1]

Aristotle, in the *Categories*, seems to have been the first to propose explicitly an independence criterion for substances.[2] Those entities which are classified as primary substances in the *Categories* (e.g., individual organisms and artifacts) are, in Aristotle's view, ontologically independent, since they are neither "said of" nor "in" anything else as a subject. Entities belonging to other categories, on the other hand, are ontologically dependent on the primary substances, since in his view they are either "said of" the primary substances as subjects or are "in" them as subjects. The first class of entities, those dependent on the primary substances by being said of them, comprises the so-called secondary substances, i.e., universals in the category of substance (e.g., the species, human being, and the genus, animal); these entities correspond to classifications of the primary substances into more general taxonomic categories. The second class of entities, which are dependent on the primary substances by being in them, comprises individuals and universals in categories other than substance (e.g., quantities, qualities,

relations, times, places, actions, passions); these entities correspond either to individual accidental features (e.g., a particular instance of red), which directly inhere in primary substances, or to more general taxonomic categories into which these individual accidental features fall (e.g., color, quality).

When we attempt to combine hylomorphism with an independence criterion of substancehood, an apparent conflict emerges. Consider, for example, organisms, which are widely regarded by neo-Aristotelians as paradigmatic examples of substances. If these alleged substance candidates are also to be construed along hylomorphic lines as compounds of matter and form, one wonders whether they will not then turn out to be ontologically dependent on entities numerically distinct from themselves (viz., their form and possibly their matter as well) and thereby jeopardize their status as substances.[3] My main focus in this chapter will be to examine the apparent tension between these two prominent strands within neo-Aristotelian metaphysics, hylomorphism and independence criteria of substancehood, and explore some possible resolutions to this apparent conflict.

2 Lowe's account[4]

E. J. Lowe has proposed the following criterion of substancehood:[5]

(ICS1) *Independence Criterion for Substances* (Lowe): x is a substance $\equiv_{def}$ (i) x is a particular; and (ii) there is no particular y such that (a) y is not identical with x and (b) x is essentially identity dependent on y.[6]

Clause (ii.b) of (ICS1) makes use of Lowe's notion of essential identity dependence, defined as follows:

(EID) *Essential Identity Dependence* (Lowe): x is essentially identity dependent on y $\equiv_{def}$ There is some function φ such that it is part of the essence of x that $x = \varphi(y)$.

We are to construe "function", as it occurs in (EID), with the notion of a *criterion of identity* in mind.[7] Lowe (1989) offers the following general schema for a criterion of identity, where "Φ" stands for a sortal term of some kind (e.g., "set") and "R" stands for a relation in terms of which the criterion of identity in question is formulated (e.g., the relation of having the same members):

(CI) $(\forall x)(\forall y)((\Phi x \,\&\, \Phi y) \rightarrow (x = y \leftrightarrow Rxy))$

An instance of (CI), in Lowe's view, is given for example by the Axiom of Extensionality for sets: if x and y are sets, then x and y are the same set just in case x and y have the same members; or, as Lowe would put it, *which* set a certain set is is fixed by *which* members the set in question has. For entities that exist in time, we are to construe (CI) for present purposes as yielding a *synchronic* criterion of identity or what is also known as a "principle of individuation", i.e., a criterion that specifies what it takes for an entity to be the very entity that it is *at* a time, rather than a *diachronic* criterion of identity, i.e., a criterion that specifies what it takes for an entity to persist *over* time. If it is to be part of the essence of the entity, x, in question that a certain function specifies a criterion of identity for x in terms of a certain relation x bears to y, then what is at issue in (EID) is a transworld principle of individuation, not one which applies merely within a given world.[8]

(EID) also speaks of a function as being part of the essence of an entity. We can understand this locution in the following way. Suppose real definitions are propositions (or collections of propositions) which state the essence, or what it is to be, a certain thing. Suppose further that propositions can have constituents. Then, for an entity to be part of the essence of another entity is for the first entity to be a constituent in the real definition of the second, i.e., for the first to be a constituent of the proposition (or of one of the propositions that belongs to the collection of propositions) that states the essence of the second entity.[9]

With this in mind, we may now approach (EID) as follows: an entity, x, is essentially identity dependent on an entity, y, when *which* entity x is is fixed by x's relationship to y. If a substance candidate, such as Socrates, is to count as an ontologically independent entity in the sense of (EID), then it must be the case that *which* entity Socrates is is not fixed by his relationship to any other entities. For Lowe, this means that no synchronic criterion of identity or principle of individuation that appeals to numerically distinct entities can be given at all for substance candidates such as Socrates: that they are the very entities they are at each time at which they exist is simply to be taken as a non-derivative fact about these entities. Thus, if Socrates is in fact to qualify as a substance, then it must be the case that he does not owe his individuation or synchronic identity, i.e., his being the very entity that he is at each time at which he exists, to his relationship to any other entity numerically distinct from himself.

Lowe's conception of the ontological independence of substances is presumably incompatible with the essentiality of origins, which he finds in any case implausible. For if it were part of Socrates' essence, for example, to have originated from a particular zygote, then it might seem that a criterion of individuation or synchronic identity could be found for a substance-candidate such as Socrates, viz., one which appeals to Socrates' origins.[10] Morever, Lowe's conception of the ontological independence of substances also conflicts with a certain natural interpretation of the neo-Aristotelian conception of unified wholes as compounds of matter and form. For if it were part of the essence of a substance candidate, such as Socrates, to be a compound of some matter and some form, then it might appear again that Socrates could be individuated by appeal to his form or matter. Since Lowe is sympathetic to the neo-Aristotelian conception of unified wholes as compounds of matter and form, he cannot avoid the conflict just raised by denying the premises that generate it. Instead, he adopts a different escape route, which itself carries with it considerable costs: in Lowe's (1999), he argues that hylomorphic compounds should be *identified* with their form and therefore are not strictly speaking *compounds* of matter and form at all.

3 Gorman's modifications of Lowe's account

Michael Gorman has recently argued that Lowe's independence criterion for substances should be modified in the following way:[11]

> (ICS2) *Independence Criterion for Substances* (Gorman): x is a substance $=_{def}$ (i) x is a particular; (ii) there is no particular y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y is not one of x's proper parts; and (iii) x is unified in the right way.

(ICS2) is just like (ICS1) with the exception that Gorman adds two clauses to Lowe's criterion, viz., (ii.c) and (iii). The first of these, (ii.c), allows an entity to qualify as a substance even if it is essentially identity dependent on entities numerically distinct from itself, as long as these entities are among its own proper parts. The second added clause, (iii), requires substances to be unified "in the right way".

These additional clauses are intended to exclude the following types of cases which Gorman considers to be counterexamples to Lowe's independence criterion, as stated in (ICS1). First, to motivate the unity-clause in (iii), Gorman asks us to consider the Berlin Philharmonic Orchestra. Assuming that orchestras are particulars, it might seem that (ICS1), as it stands, classifies such entities as substances, which Gorman takes to be an unwelcome result. Since its inception in 1882, the Berlin Philharmonic Orchestra has managed to survive all sorts of changes, e.g., with respect to its conductor or the musicians that are its members at each time at which the orchestra exists. In this way, orchestras are more similar to putative substance candidates such as organisms, which can also persist through changes with respect to their parts, than they are to alleged non-substances such as sets and mereological sums, which are not capable of surviving changes with respect to their members or parts. Since the synchronic identity of the Berlin Philharmonic Orchestra at each time at which it exists is apparently not fixed by its essential relations to any other particulars numerically distinct from itself, such as its conductor or the musicians that are members of it, (ICS1) therefore seems to have the consequence that the Berlin Philharmonic Orchestra is classified as a substance. To avoid this result, Gorman introduces the unity requirement in (iii), since he believes that what accounts for the difference between putative substance candidates such as organisms and alleged non-substances such as orchestras, sets, mereological sums, and the like is that entities which belong to the former categories are more unified than entities which belong to the latter categories. Since he does not spell out further in what way putative substance candidates are more unified than alleged non-substances, however, the exact content of the unity requirement in (iii) at this point remains to be determined.

Secondly, Gorman's exclusion of proper parts in (ii.c) rests on the idea that even entities which he regards as plausible substance candidates can have essential proper parts.[12] To illustrate, Gorman takes it to be part of the essence of H_2O molecules (which, in his view, are likely substance candidates) to be composed of the very hydrogen and oxygen atoms of which they are, in fact, composed. In that case, it appears that H_2O molecules would be classified by (EID) as essentially identity dependent on particulars numerically distinct from themselves, since there would be some function, φ, e.g., the "molecule composition" function, such that it is part of the essence of an H_2O molecule that it is the result of applying φ to the oxygen and hydrogen atoms that are its essential proper parts. The molecule's synchronic identity at each time at which it exists, in that case, would be fixed by appeal to these atoms which are its essential proper parts, much like a set's identity is fixed by appeal to its members. Unless the essential identity dependence of an entity on its own proper parts is explicitly excluded as irrelevant to its status as a

substance, as is done by clause (ii.c) of (ICS2), an H_2O molecule would therefore be classified as a non-substance by (ICS1). Such alleged non-substances as mereological sums, which are apparently also essentially identity dependent only on their own proper parts, in Gorman's view, are to be ruled out by way of the unity requirement in (iii).

4 The stipulative exclusion of non-particulars

Both Lowe's original criterion in (ICS1) and Gorman's modified criterion in (ICS2) contain clauses which explicitly exclude non-particulars from the range of entities which might qualify as substances. But the stipulative exclusion of non-particulars from an independence criterion of substancehood is problematic, because it renders apparently substantive ontological disputes over questions of fundamentality non-substantive.[13]

Consider for example two philosophers who agree that both universals and particulars exist, but disagree over which taxonomic category of entities deserves to be granted substance status: one philosopher, let us say, regards universals as occupying the ontologically fundamental role of substances, while the other takes the substances to be particulars. Given (ICS1) and (ICS2), the first philosopher's thesis, "The substances are universals", is classified as contradictory (assuming that nothing is both particular and universal), since the criteria require that by definition something is a substance only if it is a particular. The second philosopher's thesis, "The substances are particulars", in contrast, is classified by (ICS1) and (ICS2) as trivial, since it simply follows from clause (i) of the definition that the substances are particulars. If we now attempt to remedy this situation by interpreting the two philosophers engaged in this dispute as subscribing to distinct criteria of substancehood, then we reach the equally unfortunate result that these two philosophers, instead of being engaged in what appears to be a substantive disagreement over questions of ontological fundamentality, are now simply talking past each other, with each of them subscribing to a different criterion of substancehood.

Given these considerations, I take it that clause (i) should be regarded as an unattractive addition to an independence criterion of substancehood: it should turn out to be a philosophically interesting and meaningful question which taxonomic category or categories of entities (if any) satisfy a given criterion of substancehood and whether these entities are particulars or universals. We thereby arrive at the following first revision of Gorman's independence criterion in (ICS2), with the restriction to particulars deleted:

(ICS3) *Independence Criterion for Substances* (First Revision): x is a substance $=_{def}$ (i) there is no y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y is not one of x's proper parts; and (ii) x is unified in the right way.[14]

5 The stipulative exclusion of proper parts

As we have seen above, one of the two ways in which Gorman's modified criterion in (ICS2) differs from Lowe's original criterion in (ICS1) is in its addition of clause (ii.c), which eliminates part-dependence as a possible threat to an entity's status as a substance. I now want to consider the question of whether such a stipulative exclusion-clause governing proper parts should be regarded as an admissible element in an independence criterion of substances.[15] In principle, considerations analogous to those I adduced in connection with the stipulative exclusion of non-particulars appear to be relevant in this context as well: for it ought not simply to be settled by fiat whether entities which are ontologically dependent only on their own proper parts can be classified as occupying the ontologically fundamental role of substances. But instead of pursuing this line of argument, I will bring other issues to bear on the question of whether a clause excluding part-dependence should be considered an admissible component of an independence criterion of substancehood.

5.1 The possibility of simple substances

In a recent discussion of this issue, Patrick Toner has objected to the stipulative exclusion of proper parts from an independence criterion of substancehood on the following grounds (Toner 2010). In Toner's view, we should at least in principle allow for the possibility of simple substances, i.e., substances which have no proper parts at all and which therefore, *a fortiori*, cannot ontologically depend on their essential proper parts. Possible examples of such simple substances might include God, if God exists; minds, souls, or persons, according to certain conceptions of these entities; or physical simples, i.e., incomposite concrete material objects which may be included in the inventory of fundamental physics. Toner asks:

> Why accept that simple substances, which are self-sufficient in one way (a way that doesn't except dependence on their parts) are the same kind of things as 'substances' that are self-sufficient in a very

different kind of way (a way that does except dependence on their parts)? (Toner (2010), p.40)

If there are any simple entities which are not ontologically dependent on anything numerically distinct from themselves, then (ICS2), in Toner's mind, turns the category of substances into a heterogeneous collection. For one thing, this category would then comprise these simple entities which are completely ontologically independent from everything else. These entities are admitted into the category of substances by (ICS1)-(ICS3) without requiring any special exemption. But, in addition to these simple entities, the category of substances according to (ICS2) and (ICS3) would also include composite entities which may be ontologically dependent on their own essential proper parts, as long as these entities are not ontologically dependent on anything numerically distinct from them besides their own essential proper parts. These composite entities are admitted into the category of substances by (ICS2) and (ICS3) only by way of the special exception clause governing proper parts. But why believe, Toner asks, that we have thereby arrived at a unified category? This stipulative exclusion strategy, so Toner argues, is analogous to allowing into the class of all flying things not only things that have the ability to propel themselves through the air by their own power, but also things that can be carried along by something else. This way of allegedly delineating the class of flying things does not yield a unified category; nor, in Toner's view, do we arrive at a unified category of substances by allowing entities which ontologically depend on their essential proper parts to count as substances, along with entities which have no proper parts and hence cannot ontologically depend on their essential proper parts.

5.2 The threat of heterogeneity

As Toner's observations bring out, as far as simple substances are concerned (if there are such entities), Lowe's original criterion in (ICS1), stated here with the restriction to particulars deleted and a restriction to simple entities added, would do just as well as the modified criteria in (ICS2) or (ICS3):

(ICSS) *Independence Criterion for Simple Substances*: x is a simple substance $=_{def}$ (i) x is simple and (ii) there is no y such that (a) y is not identical with x and (b) x is essentially identity dependent on y.

According to (ICSS), the simple substances are those entities which are simple and completely ontologically independent from everything else numerically distinct from them. Since these entities are simple, the question of whether they are appropriately unified presumably does not arise for them; nor is there any danger that such entities might depend ontologically on their essential proper parts, given their simplicity. There is therefore no need for the addition of Gorman's unity requirement in an independence criterion for simple substances, just as there is no need for a clause exempting part-dependence.

The question now arises as to whether there are any composite substances and, if so, whether a revised version of Gorman's independence criterion might be appropriate for composite substances:

(ICCS1) *Independence Criterion for Composite Substances*:
x is a composite substance $=_{def}$ (i) x is composite and (ii) there is no y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y is not one of x's proper parts; and (iii) x is unified in the right way.

According to (ICCS1), composite entities may qualify as substances, as long as they are not ontologically dependent on anything besides their own essential proper parts and as long as they are appropriately unified.

Even if (ICCS1) carries promise as an independence criterion for composite substances, Toner would no doubt object to the resulting bifurcation of the notion of substance into simple substances, on the one hand, and composite substances, on the other, with each kind being governed by its own independence criterion. Toner's challenge to a proponent of an independence criterion for substances who endorses a bifurcated account in the style of (ICSS) and (ICCS1) is to indicate wherein the alleged unity of the category of substances lies. What, so he might ask, gives us the right to think of both (ICSS) and (ICCS1) as criteria allegedly delineating a single ontological category, rather than two separate categories, viz., the simple entities which are completely ontologically independent, on the one hand, and the appropriately unified composite entities which are ontologically independent only in a modified way?

In response to Toner's worry concerning the apparent heterogeneity or disjunctiveness in the notion of substance to which the bifurcated account indicated above seems to lead, a proponent of such an account may at least point to the fact that there is after all a *non-ad-hoc* and

metaphysically significant distinction between simple entities and composite entities. Assuming that a criterion of substancehood serves as an indicator of ontological fundamentality, it is perhaps no surprise that there might be distinct roads towards ontological fundamentality, among them one for simple entities and another for composite entities. For the time being, then, although I do feel the force of Toner's worry, I want to set it aside and examine instead the question of whether (ICCS1) might be appropriate as an independence criterion for composite substances. In what follows, I want to focus on a different challenge which arises for (ICCS1) as an independence criterion for composite substances: this challenge centers on the selective emphasis on proper parts, as opposed to constituents more generally.[16]

5.3 Proper parts vs. constituents

Something can be a constituent of a composite entity without being a proper part of it. For example, the members of sets are constituents of the sets of which they are members (where "constituency" is here construed in the set-theoretic sense of "membership"), but the members of sets should not be regarded as proper parts of the sets of which they are members.[17] Among other things, proper parthood is plausibly taken to be a transitive relation, but set-membership is not a transitive relation. (In what follows, I use the term "constituent" in such a way that proper parts are to be included among an entity's constituents; but the reverse cannot always be assumed to be true, since not all constituents are also proper parts, as the set-theoretic example just cited illustrates.)

Why should the stipulative exclusion of proper parts from an independence criterion of substance not also extend to constituents more generally? Insofar as any justification for this exclusion is given by those who endorse the stipulative exclusion of proper parts, the reasons stated would seem to carry over to non-mereological constituents as well. Gorman, for example, adduces the following considerations in favor of the exemption in question:

> To say this [i.e., that composite entities may qualify as substances even if they are ontologically dependent on their own essential proper parts] is, of course, only to follow up on Fine's own suggestion when he says that a substance does not depend on anything 'or, at least, upon anything other than its parts'. Nor is there any reason to fear that the move is *ad hoc*, as it is a development of the pre-philosophical intuition that the theory of substance is intended to make sense of. Putting the point a bit vaguely, as pre-philosophical intuitions must be put, the things that philosophers come to call substances are not dependent on others but are instead self-sufficient in some way. Now a thing with an essential part is (of course) distinct from that part, but it does not follow that the thing is not self-sufficient, because this is not a way for the thing to be related to something *outside itself*. Expressed differently, the kind of independence here sought is not compromised by dependence that, so to speak, stays within the thing in question. (Gorman (2006b), p.151)[18]

In a similar vein, Peter Simons remarks as follows:

> An object A is *strongly dependent* on an object B if necessarily, if A exists, so does B, and B is neither A nor part of A. [...] An object is independent in the corresponding sense when it depends on nothing apart from itself and perhaps parts of itself, giving a sense to the idea of something depending on nothing 'outside of itself'. (Simons (1998), p.236)

Both Simons and Gorman point to the idea that an entity's ontological dependence on its own essential proper parts should be rated differently from an entity's ontological dependence on entities numerically distinct from itself which do not number among the entity's own essential proper parts for the following reason. In the second case (non-part dependence), the entity in question is ontologically dependent on numerically distinct entities that lie "outside" of it, while in the first case (part-dependence) the entity in question is ontologically dependent on numerically distinct entities (viz., its own essential proper parts) which do not lie "outside" of it. But whatever exactly is meant by "outside" in this context, surely if an entity's proper parts do not lie "outside" of it, then neither do an entity's non-mereological constituents.

Supposing then that entities which are ontologically dependent only on their own essential constituents more generally may also qualify as substances, as long as they are appropriately unified, we arrive at the following revision of (ICCS1):

(ICCS2) *Independence Criterion for Composite Substances* (First Revision): x is a composite substance $=_{def}$ (i) x is composite and (ii) there is no y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y is not one of x's constituents; and (iii) x is unified in the right way.

Clause (ii.c) of (ICCS2) now allows back in some alleged non-substances, e.g., sets, which were previously excluded from the reaches of (ICCS1) by virtue of the restriction to proper parts. In addition to sets, we might also cite as possible further examples of alleged non-substances which are arguably ontologically dependent only on their own essential constituents such entities as quantities, collections, propositions, sentences, events, facts, and states of affairs. All of these categories of entities, if they are to be classified as non-substances, would now have to be ruled out by way of the unity requirement in clause (iii). This not only creates serious pressure for the as-of-yet unspecified unity requirement, it also makes us wonder whether clause (ii), i.e., the ontological independence requirement, is really doing any work at all in the so-called independence criterion for composite substances. Given the long list of alleged non-substances which are arguably ontologically dependent only on their own essential constituents, it seems that a *unity* criterion for composite substances might hold more promise than an *independence* criterion, assuming, of course, that we can make good on the promise of spelling out in more detail in what respects putative substance candidates, such as organisms, are more unified than alleged non-substances such as sets, orchestras, committees, quantities, collections, mereological sums, propositions, sentences, events, facts, and states of affairs. This line of reasoning seems to suggest the following significant change of direction in our attempt to provide a criterion of substancehood for composite entities:

(UCCS) *Unity Criterion for Composite Substances*: x is a composite substance $=_{def}$ (i) x is composite and (ii) x is unified in the right way.[19,20]

I will return to the role of unity in a criterion of substancehood for composite entities briefly below. For the time being, I want to turn instead to a loose thread which arose in connection with the revised independence criterion for composite substances in (ICCS2).

5.4 Intrinsicness

In the passages cited above, we saw that Gorman and Simons make at least an informal attempt to justify the exemption for part-dependence by appeal to a distinction they allude to between what lies "inside" and what lies "outside" the boundaries of a given entity. According to Gorman, an entity's ontological dependence on its own essential proper parts does not take away from the sort of "self-sufficiency" he takes to

be required for substance status, since in that case the entity in question ontologically depends only on what lies "inside" its boundaries. But non-part dependence, in his view, does disqualify an entity from substance status, since an entity's ontological dependence on what lies "outside" of its boundaries diminishes the "self-sufficiency" he takes to be required for substance status. On the basis of these considerations, we might therefore propose the following revision of (ICCS2), which makes the justification offered for the exclusion of proper parts explicit in clause (ii.c):

(ICCS3) *Independence Criterion for Composite Substances* (Second Revision):x is a composite substance $=_{def}$ (i) x is composite and (ii) there is no y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y lies "outside" of x's boundaries; and (iii) x is unified in the right way.

Since, for the proponent of an independence criterion for substancehood, "self-sufficiency" is presumably merely another name for whatever is captured by the criterion of substancehood in question, the notion of "self-sufficiency" that is appealed to informally by Gorman does not provide us with any additional information besides what is brought to the table by all the components of the independence criterion taken together. The question that is most relevant for present purposes, then, is what sense can be attached to the distinction between what lies "inside" the boundaries of a given entity and what lies "outside" of its boundaries.

The first thing to note in this connection is that we ought to separate ourselves right away from the spatial overtones that the distinction between what lies "inside" and what lies "outside" a given entity tends to evoke. (Hence the quotation marks around "inside" and "outside".) In Section IV, I argued that the stipulative exclusion of non-particulars from an independence criterion of substancehood ought to be regarded as inadmissible, since it has the unwelcome consequence that apparently substantive disputes in ontology are classified as either trivially answerable or as based on a contradiction. For similar reasons, an independence criterion of substancehood should not be formulated in terms that can meaningfully apply only to material entities, i.e., entities which occupy regions of space-time. For then the thesis "Only material entities are composite substances" would again trivially follow from the criterion of substancehood in question, while the opposing thesis, "Some non-material entities are composite

substances", could not be coherently maintained by a reasonable philosopher who subscribes to (ICCS3). Hence, a dispute between two philosophers who find themselves drawn to these two opposing theses respectively would be mistakenly classified as non-substantive. But I suspect that Gorman himself would wish to allow that the question of whether some composite substances are non-material is substantive and can be a legitimate subject of dispute between two reasonably-minded metaphysicians. If sets and other abstract entities, for example, are to be classified as non-substances by (ICCS3), then it would seem that this criterion must at least be formulated in such a way that we can sensibly ask whether the entities in question satisfy or fail to satisfy the requirements stated by each of its clauses. It would be disturbing if sets and other abstract entities were denied substance status only because the "outside"/"inside" distinction does not meaningfully apply to them.

One natural approach to the "outside"/"inside" distinction appealed to in (ICCS3) which does not require the stipulative restriction to material entities just cited is to understand it in terms of the distinction between what is *intrinsic* and what is *extrinsic* to a given entity.[21] Presumably, in whatever way exactly we construe the distinction between what is intrinsic and what is extrinsic to a given entity, any plausible account of this distinction should allow that we can just as sensibly speak of the non-mereological constituents of a non-empty set (i.e., its members) as being intrinsic to the set as we can speak of the mereological constituents of a material entity (i.e., its parts) as being intrinsic to the whole they compose. We thus arrive at the following reformulation of clause (ii.c) of (ICCS3):

> (ICCS4) *Independence Criterion for Composite Substances* (Third Revision): x is a composite substance $=_{def}$ (i) x is composite and (ii) there is no y such that (a) y is not identical with x, (b) x is essentially identity dependent on y, and (c) y is extrinsic to x; and (iii) x is unified in the right way.

If (ICCS4) strikes the proponent of an independence criterion of substancehood as attractive, he would now face the non-trivial task of having to link his criterion for composite substances to a suitable account of the intrinsic/extrinsic distinction. This requirement, for example, immediately rules out any appeals to the notion of substancehood in an account of the intrinsic/extrinsic distinction, since such an appeal would then render the overall theory in question circular. Even if we grant the proponent of an independence criterion for substances that the content of clause (ii.c) can be specified in a suitable fashion, however, we should note that (ICCS4) has some interesting consequences which may or may not be found to be objectionable by those in favor of an independence criterion for composite substances. For reasons of space, I will here only point to one such consequence to which (ICCS4) may lead, depending on the additional metaphysical assumptions with which (ICCS4) is combined.

Consider artworks and artifacts more generally. Suppose Michelangelo's *David*, for example, is essentially identity dependent on the artist, Michelangelo, who created the artwork in question with the intention of achieving a certain artistic representational goal. Given Lowe's notion of essential identity dependence, in order for the sculpture in question to be essentially identity dependent on the artist who created it with a certain artistic intention in mind, there must be some function, φ, e.g., the "is the sculpture which was artistically created with a certain representational intention" function, such that it is part of the essence of the sculpture in question that it is the result of applying φ to Michelangelo. In other words, if the condition just stated in fact holds, then which sculpture the artwork in question is is at least in part fixed by reference to the artist who created it with the intention to achieve a certain representational goal. But the artist, Michelangelo, is of course under any reasonable conception of the intrinsic/extrinsic distinction, extrinsic to the sculpture he has created. Thus, regardless of whether artworks are appropriately unified, such entities could not be awarded substance status by (ICCS4), since their ontological dependence on a numerically distinct entity that is extrinsic to them constitutes a violation of clause (ii.c). If artifacts in general are essentially identity dependent on the artisans who create them, perhaps with a certain functional intention in mind, then the same result follows more broadly for the entire category of artificially created objects. Those proponents of independence criteria of substancehood who take it to be a desideratum of their account that art works or artifacts more generally are classified as substances would thus have to weigh their options in the face of the possibility that these entities might be excluded from the category of substances, due to the extrinsicness of their individuation conditions.[22]

6 Hylomorphic compounds

In the foregoing sections, we have focused on two recent and promising attempts at providing an independence criterion of substancehood in the neo-Aristotelian tradition, viz., E.J. Lowe's criterion, in (ICS1), and

a modified version of it, in (ICS2), proposed by Michael Gorman. I objected above to the stipulative exclusion of non-particulars contained in both (ICS1) and (ICS2) on the grounds that this restriction makes it difficult to account for the apparently substantive nature of certain ontological disputes over questions of fundamentality. Moreover, our discussion of Gorman's stipulative exclusion-clause governing part-dependence seemed to indicate that unity might have an important role to play, instead of or at least in addition to independence, in drawing a substance/non-substance distinction for composite, rather than simple, entities.

I now want to bring these considerations to bear on the question raised at the very beginning of this chapter, namely whether and how it might be possible to preserve the alleged substance status of hylomorphic compounds. As I pointed out there, an apparent conflict emerges when we combine two central tenets popular among neo-Aristotelian metaphysicians: hylomorphism (the doctrine according to which unified wholes are best analyzed as compounds of matter and form) and independence accounts of substancehood, such as those investigated above. For if alleged substance candidates, such as organisms, are analyzed in the hylomorphic fashion, as compounds of matter and form, one wonders whether they will not then turn out to be ontologically dependent on entities numerically distinct from themselves (viz., their form and possibly their matter as well), thereby jeopardizing their inclusion in the category of substances. This question should certainly be of concern to neo-Aristotelians who find themselves attracted to both the hylomorphic analysis of unified wholes and an account of substancehood in terms ontological independence.

6.1 Lowe's strategy

When we attempt to apply Lowe's criterion in (ICS1) to the case of hylomorphic compounds, we seem to run into the following problem. Suppose that a hylomorphic compound is numerically distinct from its form and matter. If, following Lowe's definition in (EID), a hylomorphic compound turns out to be essentially identity dependent on its form or its matter (assuming that the form or matter associated with a hylomorphic compound are particulars), then (ICS1) will exclude such compounds from the category of substances. To prevent the outcome that hylomorphic compounds are disqualified from substance status, Lowe therefore must deny one (or more) of the following claims:

(1) A hylomorphic compound is numerically distinct from its form.
(2) A hylomorphic compound is numerically distinct from its matter.
(3) A hylomorphic compound is essentially identity dependent on its form.
(4) A hylomorphic compound is essentially identity dependent on its matter.
(5) The form which partially composes a hylomorphic compound is a particular.
(6) The matter which partially composes a hylomorphic compound is a particular.

As noted earlier, Lowe opts for the denial of (1), among other things, and endorses an interpretation of hylomorphism according to which unified wholes are to be *identified* with their forms (see Lowe (1999)). On this conception, (so-called) hylomorphic "compounds" are not strictly speaking compounds at all; rather, the form with which a (so-called) hylomorphic compound is identified, so to speak, only "resides" in the matter which embodies it and possibly does so only temporarily.[23]

Following Lowe's strategy, then, (so-called) hylomorphic "compounds" turn out to be numerically identical with their forms. If forms are non-material, and presumably essentially so, then of course the same applies to (so-called) hylomorphic "compounds", which, according to Lowe's account, are to be identified with their forms: these (so-called) hylomorphic "compounds" then turn out to be essentially non-material entities as well, which at most (and possibly only temporarily) "reside" in their material embodiments. For someone who is already for independent reasons committed to a Cartesian conception of the mind (as Lowe is), the identification of a (so-called) hylomorphic "compound" with its form may perhaps carry some measure of plausibility for specific cases, e.g., human beings, persons or conscious beings in general. But when we apply Lowe's strategy to unified wholes across the board, strange consequences follow. For example, if H_2O molecules are unified wholes (and thus are included within the range of cases to which the hylomorphic analysis of unified wholes can be expected to apply), then Lowe's strategy would lead us to identify H_2O molecules with their forms as well. But, assuming that forms are essentially non-material, H_2O molecules will then also (surprisingly, I take it) turn out to be essentially non-material entities which only "reside" in their material embodiments and possibly do so only temporarily. It would thus be preferable from the point of view of the neo-Aristotelian to investigate whether alternative interpretations of hylomorphism are available which do not commit us

to a radical expansion of Cartesian dualism to unified wholes in general, even those which lack any kind of mental life.

6.2 Gorman's exemption for part-dependence

If an independence criterion for substances is formulated in such a way that it contains an exemption for part-dependence, constituent-dependence, dependence on what lies "inside" the boundaries of an entity, or dependence on what is intrinsic to the entity in question, along the lines of Gorman's modified criterion in (ICS2) and the series of revisions we have considered in (ICS3) and (ICCS1)-(ICCS4), then further possibilities are opened up for the neo-Aristotelian who is attempting to resolve the apparent conflict identified above between his commitment to hylomorphism and his sympathy for accounts of substancehood that are based on ontological independence. For given the modified criterion and its subsequent revisions, a hylomorphic compound, assuming that it is appropriately unified, would be able to qualify as a substance as long as those numerically distinct entities (if any) on which it is essentially identity dependent are either among its proper parts (in accordance with (ICS2), (ICS3) and (ICCS1)); or among its constituents (in accordance with (ICCS2)); or "inside" of the boundaries of the hylomorphic compound in question (in accordance with (ICCS3)); or intrinsic to the hylomorphic compound in question (in accordance with (ICCS4)). But I take it that, on any reasonable formulation of the hylomorphic position, the form and/or matter of which a hylomorphic compound consists would satisfy at least one, and possibly all, of these conditions. According to the mereological reading of the hylomorphic position, compounds of matter and form strictly and literally speaking contain their form and matter as proper parts, thus qualifying as substances under any of the versions of Gorman's criterion.[24] A modified version of this position is also available according to which the form and/or matter of which a hylomorphic compound consists are at least regarded as constituents, if not proper parts, of the entity in question. Even those who find neither of these interpretations of the hylomorphic position palatable may avoid the extreme measure taken by Lowe by endorsing one of the revised versions of Gorman's modified criterion I offered for composite substances in (ICCS3)-(ICCS4). Hence, even if hylomorphic compounds turn out to be essentially identity dependent on their form and/or their matter, they would not thereby be excluded from substance status given either Gorman's exemption for part-dependence or any of the revised formulations I offered subsequently.[25]

6.3 Form as principle of unity

But there is a further and, in my view, preferable option available to the neo-Aristotelian who already accepts hylomorphism for independent reasons and who wishes to support the inclusion of hylomorphic compounds in the category of substances. After all, in the view of the neo-Aristotelian, what distinguishes hylomorphic compounds from other, less unified, composite entities (e.g., sets, mereological sums, committees, and the like) is precisely that hylomorphic compounds contain within themselves a principle of unity which these other, less unified, composite entities lack, namely their forms. Traditionally, forms are assigned the special role of acting as the principle of unity within the hylomorphic compound, i.e., as that active power within the hylomorphic compound which somehow ties together its material components into a single unified whole, as opposed to, for example, a mere heap, aggregate or plurality. The neo-Aristotelian thus would seem to be missing out on an important advantage he gains through his commitment to hylomorphism if he did not also capitalize on the special role of form as the principle of unity within the compound in his quest to formulate an adequate criterion for substancehood.

If we are to take this option seriously, as providing us with a credible route towards a unity criterion for composite substances, we would, of course, need to know more about what it means to designate form as that active principle which plays the role of the unifying the hylomorphic compound. Different answers to this question are available to the neo-Aristotelian, depending on the particular version of hylomorphism he embraces. Given the interpretation of the hylomorphic position I defend in Koslicki (2008), a hylomorphic compound counts as unified, due to the presence of form within it, in the following sense. Since wholes, on my view, are by definition mereologically complex objects, i.e., objects which have parts, the unity of a whole cannot very well consist in its being completely indivisible into parts. Rather, for a whole to be unified is just for its material components to satisfy the structural constraints posed by the formal components associated with the kind to which it belongs. To illustrate, with respect to the kind, H_2O molecule, a successful case of composition requires two hydrogen atoms and one oxygen atom to enter into the configuration of chemical bonding that is required to form a particular specimen of the kind in question. The degree of unity had by wholes of this kind is just the degree of unity that is conferred on hydrogen and oxygen atoms when they are configured in the particular arrangement of chemical bonding that is characteristic of H_2O molecules. The material components composing

H_2O molecules are of course not completely inseparable from each other by means of the application of physical forces; nor do their spatiotemporal boundaries even have to touch in order for these hydrogen and oxygen atoms together to compose a unified whole, i.e., *one* exemplar of the kind, H_2O molecule. If we expected the material components of a unified whole to hang together in a different way, e.g., in a way that makes them physically inseparable or at least requires their spatiotemporal boundaries to touch, then I would argue that, in following these expectations, we would have set ourselves up for failure in our search for a reasonable account of how the formal components of a hylomorphic compound contribute to its unity.[26] But much more, no doubt, remains to be said about the role of form as a principle of unity in the hylomorphic compound, and I intend to return to this important and interesting topic in future discussions.

7 Conclusion

In this chapter, I considered particular attempts by E. J. Lowe and Michael Gorman at providing an independence criterion of substancehood and argued that the stipulative exclusion of non-particulars and proper parts (or constituents) from such accounts raises difficult issues for their proponents. The results of the present discussion seem to indicate that, at least for the case of composite entities, a unity criterion of substancehood might have at least as much, and perhaps more, to offer than an independence criterion and therefore ought to be explored further by neo-Aristotelians in search of a defensible notion of substancehood. I indicated briefly how such a unity criterion might be used by neo-Aristotelians to support the inclusion of hylomorphic compounds in the category of substance, given the traditional role of form as the principle of unity within the compound.

Notes

1. Many different definitions of ontological dependence have been offered in the literature. For example, some formulations are given in terms of necessity and existence; others in terms of the explanatory connective "because"; and yet others in terms of a non-modal conception of essence. Some of these formulations concern relations among particulars; others are generic concepts which concern entities of a certain kind in general. In this chapter, I will consider only formulations of ontological dependence which (in my view) carry promise from the point of view of the neo-Aristotelian, who is interested in using ontological independence for the purposes of demarcating the substances from the non-substances. For a discussion of alternative conceptions, see Koslicki (2013).

2. He remarks there as follows: "Thus all the other things are either said of the primary substances as subjects or in them as subjects. So if the primary substances [were] not it would be impossible for any of the other things to [be]" (*Cat.*, Ch.5, 2b3–6; translation by J. L. Ackrill (cf. Barnes (1984)). Since I do not read Aristotle's independence criterion in an exclusively existential way, I have substituted occurrences of the verb "to be" in place of occurrences of the verb "to exist" in the passage just cited; for more discussion, see Koslicki (2013).
3. In what follows, I intend to use the term, "substance candidate", in such a way that it applies to entities (such as organisms) which neo-Aristotelians are tempted to include in the category of substances. However, for the time being, since we are currently engaged in a discussion of what sort of criterion of substancehood neo-Aristotelians should adopt, I take it to be an open question which of the kinds of entities that are designated as "substance candidates" really, at the end of the day, make it into the category of substances.
4. In what follows, I will refer to Lowe's and Gorman's criterion as an "independence criterion of substancehood", even though ontological independence is not the only component of their respective accounts.
5. For Lowe's most up-to-date views concerning ontological dependence, see Lowe (2006), (2005) (last revised in 2009), (2008), (2012), (2013). For discussions of ontological dependence in his earlier work, see Lowe (1994), (1998). Also relevant are his views concerning criteria of identity; see for example Lowe (1989), (1997), (2009).
6. (ICS1) is a slightly reformulated version of what is called "(SUB-4)" in Lowe (2005).
7. I provide a more detailed discussion of Lowe's notion of essential identity dependence in Koslicki (2013).
8. Expressions like "is fixed by" or "is determined by" of course themselves indicate a certain explanatory asymmetry which is not explicitly stated in (EID) or (CI). For example, according to Lowe, a trope, x, is essentially identity dependent on a concrete particular object, y, that is x's bearer; that is, the individuation of x is parasitic on the identity of y. But if we stated this relation between x and y merely by means of a material biconditional, we would not have fully exhausted the asymmetric dependence that obtains between them.
9. Lowe is operating with a *non-modal* conception of essence which contrasts with the more mainstream *modal* conception of essence in the following way. An essential truth, according to a modal conception of essence, is just a modal truth of a certain kind (viz., one that is both necessary and *de re*, i.e., about a certain object); and an essential property is just a feature an object has necessarily, if it is to exist. The essential truths, according to this approach, are thus just a subset of the necessary truths; and the essential properties of objects are just a special kind of necessary property. (For some representatives of the modal tradition, see, for example, Plantinga (1974), Forbes (1985), Mackie (2006).) In contrast, according to a non-modal conception of essence, such as that developed by Aristotle and Kit Fine, the necessary truths are distinct and derivative from the essential truths; and the necessary features of objects, traditionally known as the "propria" or "necessary accidents", are distinct and

derivative from, the essential features of objects. (See for example Aristotle's *Posterior Analytics*; Fine (1994), (1995a), (1995b), (1995c); I discuss Aristotle's and Fine's non-modal conception of essence in Koslicki (2012).)

10. Though whether concrete particular objects can in fact be individuated across worlds by means of their origins is a controversial question, as the voluminous literature on this topic indicates. See, for example, Forbes (1985), (1986), (1997), (2002); Mackie (2002), (2006); and the references to be found therein.
11. Gorman (2006a), p.116. (ICS2) is a slightly reformulated version of what Gorman calls "RLS*".
12. Only essential, rather than accidental, parts are relevant to the question of whether an entity should be disqualified from its status as a substance due to the fact that it is ontologically dependent on entities numerically distinct from itself (namely, in this case, its own proper parts). For clause (i.b) in (ICS2) narrows down the range of entities which might pose a threat to x's status as a substance to those entities, y, on which x is essentially identity dependent. But no entity, x, would count as essentially identity dependent on its accidental parts, since it would not be the case that there is a function, φ, (e.g., the "is mereologically composed of" function) such that it is part of x's essence that x is the result of applying φ to any of its accidental parts. Since x can survive through changes with respect to its accidental parts, x's identity at any time or world at which it exists cannot be fixed by which entities, y, z, w, ..., are its accidental parts at that time or world. In what follows, when I consider the question of whether the exclusion of proper parts from the criterion of substancehood is admissible, I will therefore limit myself to the discussion of essential, rather than accidental, parts.
13. The restriction to particulars is also present in an independence criterion of substancehood proposed in Schnieder (2006), according to which x is a substance just in case x is a particular and there is no y such that x rigidly and permanently existentially depends on y. "Rigid and permanent existential dependence" is defined as follows: x rigidly and permanently existentially depends upon y just in case there is a property, F, such that necessarily for any time, t, at which x exists, x exists at t because y is F at that time" (Schnieder 2006, p. 412). Correia's notion of "basing" (Correia 2005, pp.66 ff) and his definition of "simple dependence" in terms of "basing" is similar to Schnieder's "rigid and permanent existential dependence"; see also Correia (2008). For discussion of this approach to ontological dependence, see Koslicki (2013).
14. Both Lowe's criterion in (ICS1) and Gorman's criterion in (ICS2) contain an additional restriction to particulars in clause (ii), which I have also removed in this revision of Gorman's criterion in (ICS3). According to this additional restriction, given that both Lowe and Gorman take it to be a settled question that only particulars may qualify as substances, the only entities, y, which could pose a threat to an entity, x's, status as a substance are other particulars numerically distinct from x on which x is essentially identity dependent. But again we may wonder whether the exclusive focus on particulars is legitimate. If an entity, x, is essentially identity dependent on an entity, y, that is numerically distinct from it, then should x's status as a substance not thereby be jeopardized, even if y is a non-particular (e.g., a universal)? As far as I can see, this kind of possibility is already ruled out by other considerations

and the second restriction to particulars in clause (ii) may therefore be safely removed. For suppose that it is part of Socrates' essence to be human and that Socrates' humanity is here construed as a universal. Still, the universal, humanity, could not have a role in fixing Socrates' identity at every time and world at which he exists, since it is also part of the essence of many other particulars (e.g., Plato, Aristotle) that they exemplify the same universal. Thus, in order to determine which exemplar of the universal, humanity, Socrates is at every time and world at which he exists presupposes that Socrates' identity is already settled.

15. Gorman is again not alone in opting for the stipulative exclusion of proper parts from an independence criterion of substancehood. Kit Fine for example states that "...a substance may be taken to be anything that does not depend upon anything else or, at least, upon anything *other than its parts*" (Fine (1995a), pp. 269–70; my emphasis). Similarly, Peter Simons offers an independence criterion of substancehood in terms of what he calls "strong independence", which also explicitly excludes proper parts from its range: an entity x is strongly dependent on an entity y just in case necessarily, x exists only if y exists and y is neither identical to x *nor a proper part of x* (Simons (1998), p. 236; my emphasis).
16. Gorman replies to Toner's heterogeneity worry in Gorman (2011) and argues that his account does, in fact, provide a unified criterion of substancehood: the substances are all and only those entities which are ontologically independent from all numerically distinct entities "outside" of themselves; this, according to Gorman, applies to both simple and composite entities. When we focus on what goes on "inside" the boundaries of an alleged substance, however, we can still discern a difference between simple and composite entities. The "inside"/"outside" distinction which is invoked by Gorman and others in an attempt to give at least an informal justification of the stipulative exclusion of proper parts from an independence criterion of substancehood itself raises interesting questions to which we will turn shortly below.
17. Though see Fine (2010) for a more generalized notion of parthood which allows for members to be parts of sets and which is closer to what I am calling here "constituency".
18. See also Gorman (2006a), p. 116, for a similar comment.
19. Given that ontological independence has completely dropped out of the picture in (UCCS), Toner's earlier heterogeneity worry of course arises again with a vengeance: if simple entities (if there are any) qualify as substances for one reason (their ontological independence) and composite entities qualify as substances for a completely different reason (their unity), why should we believe that (ICSS) and (UCCS) point to a single ontological category, rather than two distinct ontological categories which have been misleadingly called by the same name? As noted earlier, the proponent of such a bifurcated account can at least draw on the non-ad hoc and metaphysically significant distinction between simplicity and complexity. Moreover, we may point out as well that simple entities are presumably also unified in the right way, due to their simplicity; in that sense, a unity account applies both to simple and composite substances, but perhaps only trivially so in the case of simple substances.
20. One interesting case to consider in connection with (ICSS) and (UCCS) is that of tropes. Lowe and Gorman take tropes to be entities which are both simple

and essentially identity dependent on their "bearers", viz., the substances in which they inhere. They would therefore be classified (correctly, in their view) as non-substances by (ICSS). Being simple, tropes are presumably also unified by default; but their unity is irrelevant to their alleged status as non-substances, since they are subsumed under (ICSS), the criterion governing simple entities, rather than under (UCCS), the criterion governing complex entities.

21. The question of how best to draw the intrinsic/extrinsic distinction has generated an enormous literature and I will not at present try to enter into this debate; but see for example Humberstone (1996), Lewis & Langton (1998), Sider (1996) and Yablo (1999) for discussion.
22. Those who find (ICCS4) attractive might, of course, respond to the consideration just raised by rejecting the central assumption used in generating it, viz., that artworks in particular, and perhaps artifacts more generally, are in fact essentially identity dependent on their creators, in Lowe's sense. Since a proper discussion of this question would carry us too far into the special metaphysical issues raised by art works and artifacts more generally, I will not pursue this issue further here. For present purposes, I am content to note that, given apparently plausible assumptions which at least cannot be dismissed out of hand, (ICCS4) will exclude these objects from substance status as well as any other objects (if there are any) whose synchronic identity is fixed by appeal to numerically distinct entities extrinsic to them. The same result would have followed from any of the previous formulations of Gorman's independence criterion as well. Thus, it is not the addition of the extrinsicness clause in particular which generates the result that artworks and/or artifacts in general are excluded from substance status; the most recent revision merely attempts to make explicit the motivation which presumably lies behind the exemption for proper parts in the first place. Alternatively, those in favor of (ICCS4) might also consider it to be an advantage that this criterion excludes art works and artifacts from the category of composite substances due to the extrinsicness of their individuation conditions.
23. Lowe would, no doubt, be happy to deny (4) as well: since hylomorphic compounds can apparently survive changes with respect to their material parts, it cannot be the case, given (EID), that the synchronic numerical identity of a hylomorphic compound is fixed by the matter which composes it at any time or world at which it exists. But the denial of (4) alone is not enough to escape our current quandary: for, as long as (1) and (3) still hold, a hylomorphic compound nevertheless threatens to be essentially identity dependent on an entity that is apparently numerically distinct from itself (namely its form) and its (alleged) substance status would thus still be in jeopardy, even if (4) is rejected.
24. This is the version of hylomorphism for which I argue in Koslicki (2008) and which is also endorsed in Fine (1982) and (1999).
25. For alternative ways of spelling out the hylomorphic position, see, for example, Harte (2002); Johnston (2002), (2006); Rea (2012).
26. This is by no means the only direction available to neo-Aristotelians who wish to account for the role of form as the principle of unity within the hylomorphic compound. For a very different conception of unity, see, for example, Hoffman & Rosenkrantz (1999).

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