A Paradox of Matter and Form[1]

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Abstract. In the face of the puzzles of material constitution, some philosophers have been moved to posit a distinction between an object's matter and its form. A familiar difficulty for contemporary hylomorphism is to say which properties are eligible as forms: for example, it seems that it would be intolerably arbitrary to say that being statue shaped is embodied by some material object, but that other complex shape properties aren't. Anti-arbitrariness concerns lead quickly to a plenitudinous ontology. The usual complaint is that the super-abundance of material objects is too extraordinary to accept, but I want to raise a different worry: I argue that the most natural way of developing this picture is already inconsistent. I show that a simple version of plenitudinous hylomorphism is subject to a Russellian argument, but argue that we cannot treat the problem straightforwardly as an instance of Russell's Paradox of Sets.

In the face of the puzzles of material constitution, some philosophers have been moved to posit a distinction between an object's *matter* and its *form*.[2] The puzzles are familiar: it seems that, by Leibniz's Law, the statue must be distinct from the lump of clay that makes it up, because the lump can survive squashing while the statue cannot. My favorite knit hat must be distinct from its yarn, because the yarn can survive unravelling, but the hat (sadly) cannot. The matter that makes up the oak tree outside my window is distinct from the tree itself, because the matter can survive being fashioned into a table after the tree has been destroyed. On the other hand, it is hard to see how these things could differ from each other when they appear so intimately related.

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[2] Among the most vigorous defenders of this kind of contemporary hylomorphism are Kathrin Koslicki (2008) and Kit Fine (1982, 1999, 2007, 2008). For slightly different approaches to hylomorphism, see Simon Evnine (2016) and Thomas Sattig (2015).

After all, the statue and the lump seem to share their material parts, occupy the same regions, have many of their non-modal properties in common, and so on.

Hylomorphism purports to address both sides of this puzzle. Very informally; according to hylomorphists, objects both have matter — the chunky stuff that makes them up — and embody forms — a non-chunky component that somehow unifies, moulds, or structures their material parts. Thus, although the statue and the lump share their matter, the statue, unlike the lump, embodies the property of *being statue shaped*. This is meant to allow us to accommodate the application of Leibniz's Law while at the same time making the distinction between the statue and the lump somewhat less mysterious: although their difference in form explains their different modal properties, they nonetheless are made of all the same chunky stuff, so it is no wonder that they are so intimately related. [3]

Although hylomorphists agree that there is a difference between merely instantiating a property (as the lump does) and having it as a form (as the statue does), they differ on the details. Some hylomorphists say that properties are formal parts of the objects that embody them, others say that they are non-mereological constituents of objects, and still others say that forms are instead some kind of non-constituent constraint on objects.[4] Although these are important differences, my plan here is not to focus on the details of any particular account. I am instead interested in the minimal version of hylomorphism that emerges when we take seriously the difficulty of saying which properties are eligible as forms — and thus, which embodiments there are. [5]

For a theory to be viable as a response to the puzzles of material constitution, it must have a permissive enough conception of forms to generate all of the objects we ordinarily recognize. Whenever some matter instantiates the property *being statue shaped*, we want the account to guarantee that there is a further object — a statue — which embodies that property. The difficulty is finding some principled stopping point: it seems that it would be intolerably

[3] Though see Sidelle (2014) for a recent critique of this strategy.
[4] Koslicki and Fine both take forms to be mereological parts of embodiments, Rea (2011) takes them to be non-mereological constituents, while Johnston (2006) talks instead of principles of unity governing (but not composing) embodiments.
[5] Some hylomorphic theorists answer this challenge: for example, Koslicki (2008:190) proposes an existence principle that says that only kinds (not properties in general) give rise to embodiments.

arbitrary to say that *being statue-shaped* is eligible as a form, but that a range of other complex shape properties aren't.[6] To avoid arbitrariness, it seems that we should avoid positing *any* restriction on forms, which will in turn lead us to an abundant ontology of embodiments.[7]

One standard complaint about this picture is that the super-abundance of material objects is too extraordinary to accept.[8] I want to raise a different and prior worry: that the most natural and attractive way of developing this rough picture (what I'll call "simple hylomorphism") is already inconsistent. Simple hylomorphism is subject to problem analogous to Russell's Paradox: I show that, on pain of contradiction, we'll have to surrender something from the simple account. However, it isn't immediately obvious what we should give up; despite the close parallels, we cannot treat the problem straightforwardly as an instance of Russell's Paradox. Standard responses to the set-theoretical argument turn out to be surprisingly unhelpful here.

A bit of vocabulary, first: I follow Fine (1982) in calling an object which embodies some property a "qua-object". A qua-object has both a *form* and a *base*. Following Fine (1999, 2008), I'll denote a qua-object with base *a* and form *F* by writing *a/F*. Simple hylomorphism is given by the following pair of principles:

Existence. Given any property *F* and object *a* such that *F(a)* , there is some thing *b* such that *b* is *a/F*.

Uniqueness. For any properties *F* and *G* and objects *a, b*, *a/F* = *b/G* iff *a* = *b* and *F* is the same property as *G*.[9]

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[6] This may be an oversimplification of the example. You might think that for *statues* the relevant property is more complex than *being statue shaped,* perhaps also involving a relation to the intentional action of a creator. Since nothing hangs on this example in what follows, I follow Fine (1982) in appealing to the simpler presentation. However, see Evnine (2009:206), where this point is developed as a problem for Fine's account, and Thomasson (2003) for further discussion of this sort of view of artifactual kinds. I am grateful to an anonymous referee at *Thought* for this observation.

[7] See Sosa (1999) for this route to a super-abundant ("explosive") Aristotelian ontology. Worries about arbitrariness also play an important role in motivating other abundant ontologies; eg. in Yablo (1987:307) and Sidelle (2002:118-119). For recent discussion of arguments from arbitrariness, see Korman (2015).

[8] See, for example, Koslicki (2008: 83).

[9] Exactly how we understand property identity will not be relevant, as long as we suppose that if F and G are the same property, something is F iff it is G. That is, we will require only coextensiveness for the argument below. I return to this in 2.2.

Existence reflects the aversion to arbitrariness, and says that for *any* instantiated property, there is a qua-object that embodies it. Uniqueness gives the individuation conditions for qua-objects: qua-objects are the same just in case they have the same bases and embody the same property. This guarantees, among other things, that the matter-qua-*being statue-shaped* and the matter-qua-*being lumplike* are distinct, despite having the same material basis. Although Uniqueness is suggested by the identity conditions explicitly proposed in Fine (1982) and Fine (1999), something like it seems to be presupposed in most contemporary versions of hylomorphism.[10]

1 The Problem

The structure of the argument is analogous to the argument in Russell's Paradox of Sets, and can be presented in four steps:

(i) There is a property ***N*** which an object instantiates *iff* it embodies a property that it does not instantiate.

(ii) Some thing *m* instantiates ***N***.

(iii) By (i), (ii), and *Existence*, there is a qua-object *m/**N***.

(iv) (iii) is inconsistent with *Uniqueness*.

A liberal conception of properties gives us (i). Roughly, according to the liberal conception, corresponding to any intelligible condition there is a property had by exactly the

[10] Although Fine does not typically make the range of *F* explicit, if we read his principles unrestrictedly as I have them here, Existence follows from a stronger principle of Fine's (also called *Existence*) in (1982:100) and (2008: 112). Similarly, Uniqueness is part (i) of Fine (1982)'s *Identity*, and is a consequence of the plural principle (R3) in Fine (1999:66). It is worth emphasizing that Uniqueness isn't an idiosyncrasy of Fine's view, though he states it most explicitly. It seems to fall out of the informal characterization of hylomorphism; we talk of "the" property or quality that an object embodies, assume that object have a single formal part, and so on.

things that satisfy that condition.[11] Although a defense of this background picture of properties is beyond the scope of this paper, I'll briefly revisit it in *Section 2.1*.

We can argue for (ii) in a number of ways, since all we need is a qua-object *a/F* that doesn't instantiate *F*.

One straightforward argument depends on the assumption that qua-objects are distinct from their bases, so any qua-object that embodies a property had *only* by its base will satisfy (ii). Schematically: if there is at least one object *a*, the liberal conception of properties guarantees that there is a property *F* had *only* by *a*. By Existence, there is a qua-object *a/F*, and if the distinctness assumption holds, *a/F* isn't *F* (because only a is F, and a/F isn't a).

How plausible is the distinctness assumption? On the one hand, a large part of the initial appeal of simple hylomorphism is that in the paradigm puzzle cases, it allows us to accommodate the modal differences between ordinary objects and their matter by providing a framework capable of distinguishing them. So, for example, the hylomorphist can offer an especially attractive explanation of why the matter-qua-*being statue shaped* is more modally fragile than the matter itself. On the other hand, the most obvious cases with the right structure to support (ii) -- namely, where a qua-object embodies a property had only by its base -- seem much more implausible. For example, if *o* and *o-qua-being identical to o* are distinct, then *o*-qua-*being identical to o* embodies a property it doesn't instantiate (since only *o* has that property). But *o*-qua-*being identical to o* doesn't seem to differ modally from *o*, so we lack our usual grounds for distinguishing a qua-object from its base.

Happily, for the argument above to work, we need only an object that is *contingently* the unique *F*. Given the plausible principle that *a/F* exists only when *a* is *F*, then if Michael is contingently God's (uniquely) favorite angel, the qua-object Michael/*being God's favorite angel* is more modally fragile than Michael himself. (And thus, plausibly distinct from Michael.)

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[11] If we wanted to put this more rigorously using the language of second-order logic, we interpret X as ranging over properties and define properties intensionally. Then the liberal conception of properties corresponds to the assumption that properties obey:

Full Property Comprehension. $\exists X\Box\ \forall x\,(Xx \leftrightarrow \Phi(x))$

where Φ doesn't contain X. In this language, ***N*** is:

$Nx:\quad \exists y \exists F\,(x=y/F \wedge \sim Fx)$.

Michael/*being God's favorite angel* doesn't enjoy the same exalted status as Michael, and so embodies a property that it doesn't instantiate.[12]

More interestingly, we can justify (ii) even without the distinctness assumption. The argument is slightly less straightforward, but requires nothing beyond the principles of simple hylomorphism. If there are at least two things *a* and *b*, the theory of properties guarantees that there is a property *F* had by only *a*, and a property *G* had by only *a* and *b*.[13] By Existence, there is *a/F* and *a/G*, and by Uniqueness, these are distinct. In the absence of the distinctness assumption, we're free to identify either *a/F* or *a/G* with *a*, but we cannot identify both with *a*. Ultimately, we can show that however this goes, there will still be something that fails to instantiate its own form, and so there will be something that instantiates *N***.** [14]

The next two steps of the argument follow immediately: (iii) is just an application of Existence. Call the object from (ii) *m*, then since *Nm,* Existence gives us *m/N*. Step (iv) of the argument is similarly straightforward, and reminiscent of Russell's Paradox. The qua-object *m/N* either instantiates *N* or it doesn't:

I. If *m/N* doesn't instantiate *N*, then there is some property that it embodies which it does instantiate. But this is just what it is for something to be *N*. So if *m/N* doesn't instantiate *N*, then *m/N* does instantiate *N*.[15]

II. If *m/N* does instantiate *N,* then *m/N* must fail to instantiate some property that it embodies. But by Uniqueness, the only property *m/N* embodies is *N*: so if *m/N* instantiates *N*, then *m/N* doesn't instantiate *N*. [16]

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[12] Thanks to Jeremy Goodman for suggesting this route.

[13] We could interpret *F* as "being a" and *G* as "being a or b", but again the argument would work even if *F* and *G* are properties contingently had by only *a* and only *a* and *b*, respectively.

[14] The simple case is if *a/F* isn't *a*. Then *a/F* fails to be *F*, and we are done. But if *a/F* is *a*, then *a/G* isn't. There are two such cases: either *a/G* is distinct from both *a* and *b*, or *a/G* is *b*. In the first case, *a/G* fails to be *G*, and we are done. In the latter case, *a/G* is *G*. However, there is a further property had only by *b*: *Hx* = *{b}*. Existence gives *b/H*, which by Uniqueness is distinct from *a/F* and *a/G*. So, if *a/G* is *b*, then *a/H* isn't -- and again, we have something which doesn't instantiate the property it embodies.

[15] More rigorously, we trivially have

$\sim N(m/N) \rightarrow m/N=m/N \wedge \sim N(m/N)$

and by existential generalization

$\exists y \exists F (m/N=y/F \wedge \sim F(m/N))$

So, by the definition of N,

$\sim N(m/N) \rightarrow N(m/N)$

[16] More rigorously, by the definition of N above:

$N(m/N) \rightarrow \exists y \exists F (m/N=y/F \wedge \sim F(m/N))$

On pain of contradiction, we can't hold on to the minimal package. It seems that are only two salient routes for responding to the puzzle. Short of abandoning the liberal conception of properties, we must either give up Existence -- to block the construction of the Russell object entirely -- or surrender Uniqueness. Both routes are parallel to responses to Russell's paradox of sets, but as we'll see, some of the corresponding moves look much less plausible in this setting.

2 Responses

Before exploring these two responses, I want to pause to head off the temptation to aim our attentions elsewhere.

This argument relies on the liberal theory of properties assumed in the background. This is what guarantees that there is a property (*N)* that a qua-object has just in case it doesn't instantiate any property it embodies. The important feature of this view for our purposes is that it is allows impredicative conditions to determine genuine properties, meaning roughly that we allow property-determining conditions to contain quantifiers ranging over properties. A weaker conception of properties -- for example, one that regarded only predicative conditions as intelligible -- wouldn't guarantee that *N* is a genuine property, and so the argument would never get off the ground.

But weakening our (otherwise consistent) theory of properties in light of the problems for simple hylomorphism would surely be an overreaction. For those who already take issue with the liberal conception of properties, the minimal theory may be safe. Intuitively, however, this argument doesn't show us that the property involved is somehow pathological. Instead, it seems to cast suspicion on the object that embodies the property. Something has gone wrong in the theory of embodiments, not in the theory of properties on which it relies.

By existential instantiation,

$m/N=a/G \wedge \sim G(m/N)$

Thus, by Uniqueness, $m = a$ and G is the same property as N. So, G is at least coextensive with N. But then,

$\sim G(m/N) \rightarrow \sim N(m/N)$

So

$N(m/N) \rightarrow \sim N(m/N)$

2.1 Weaken Existence

Instead, we might say that although the properties involved in the argument are genuine properties, they fall outside of the scope of the Existence principle for qua-objects. On this strategy, although properties are abundant, not all properties are eligible as forms. Given an appropriately restricted alternative to Existence, we could avoid the "Russell-like" qua-object in (iii) (namely, *m/N*).

But such a principle would have to be independently motivated, and we already have good reason to be suspicious of any such restriction. Simple hylomorphism was initially attractive on the grounds that no satisfying, non-arbitrary alternative to Existence seemed available. Does this argument point us towards any *new* candidates?

We might hope that the analogy with Russell's paradox could help here. For example, the lesson of the argument in the set-theoretic setting is sometimes taken to be that some properties specify collections "too large" to be sets. The analogous diagnosis here is that ***N*** is unsafe because it is too large, and so we should restrict the range of *F* in Existence to "small enough" properties. But this is clearly hopeless: such a restriction looks painfully ad hoc in this setting, and renders the theory too weak to do its intended job. The existence of a statue shouldn't depend on the number of statue shaped lumps of clay, and yet given the size diagnosis, a world with too many statute-shaped lumps would be a world without statutes.

Maybe this isn't the most promising connection for our purposes -- perhaps other ways of weakening the set-theoretic analog of Existence will inspire less ad hoc alternatives. One of the most familiar responses to Russell's Paradox is to embrace the iterative conception of sets. On the iterative conception, we think of sets as being "built" in "stages". At each stage of the cumulative hierarchy, we can only form new sets from sets that have already been built at earlier stages. The analogous conception of the hylomorphic domain is quite attractive: we begin with "mere matter" and all of the properties had by mere matter, and then build our first stage of qua-objects. From there, we can introduce "second stage" qua-objects which embody the properties had by those at the first stage, and so on. This amounts to insisting that Existence is restricted in two ways. The first way is reasonably intuitive; the alternative existence principle

can only deliver qua-objects that have lower-stage objects as bases. The more surprising restriction that comes with the iterative picture is the one we actually require to avoid the argument: qua-objects can only embody properties that are instantiated *only* by lower-stage objects. (So, for example, the closest thing to the Russell object we get on this picture is an *level-n* qua-object *m* that embodies the property of *being a level n-1 qua-object that doesn't have the property it embodies.* But there is no contradiction in *m* lacking *that* property.)

Again, what is plausible in the set-theoretic case is too weak to be plausible here. The iterative conception of material objects seems to gut simple hylomorphism of its explanatory power. Simple Hylomorphism is supposed to help us explain how (for example) the lump and the statue can share the property *being statue shaped,* but the latter and not the former embodies it. On the iterative conception, *nothing* can have the property it embodies, because it can only embody "lower stage" properties.

It seems that the connection to the set-theoretic case doesn't suggest any adequate, non-arbitrary alternative to Existence. A more radical response is to regard the argument as forcing arbitrariness upon us. This is where Fine (2007) lands, albeit for very different reasons. He argues that for some domains (including the domain of the material) what exists may "inevitably be an arbitrary matter". Fine suggests that this is because embodiments might not be subject to a general existence axiom after all; which embodiments there are might depend instead on which objects we (through human activity) introduce or recognize. [17]

If we are comfortable with this kind of relativity, then there may be room to overcome our commitment to anti-arbitrariness and accept some restriction to Existence. Still, it would be surprising, I think, to find that arbitrariness or relativity in material object ontology is inevitable *on pain of inconsistency*. The credentials of the idea that admitting arbitrariness should be a last resort are strong. Thankfully, we haven't yet been brought to our last resort.

[17] Fine (2007:163-165) Interestingly, he illustrates this picture by appeal to the cumulative hierarchy. While I think the Finean proposal might be used to fill out the iterative proposal discussed in the previous paragraph, they still amount to different responses to the problem. It seems that the iterative proposal can be developed without anthropocentrism -- the problem there is one of inadequacy, not arbitrariness. Fine's proposal, on the other hand, is only able to help us with the Russellian argument if the "inevitably arbitrary" procedure by which qua-objects are generating somehow blocks step (iii). It isn't obvious to me that the picture he has in mind will prevent us from "introducing" a Russell-object.

2.2 Abandon Uniqueness

The second reaction to the puzzle is to abandon Uniqueness and leave Existence untouched.[18] Although this route may seem initially unpromising, my aim in this section is to suggest that for the hylomorphist who is reluctant to give up Existence, it is worth taking seriously. But how weak would an adequate restriction of Uniqueness have to be?

In argument in *Section 1,* we appealed to Uniqueness where in fact we might have appealed to something much weaker. Consider the following apparently innocuous consequence of Uniqueness:

Extension. For any *F* and *G*, if *a/F = b/G*, then for all *c*, *Fc* iff *Gc*.

We can re-run the argument in defense of step (iv) using only Extension. We only needed to appeal to Uniqueness once, in showing that if *m/N* instantiates *N*, then *m/N* doesn't instantiate *N* (II). Briefly, that argument can now go as follows: If *m/N* instantiates *N*, then by the definition of N, there is some *y* and some property *G* such that *m/N = y/G* and *m/N* doesn't instantiate *G*. But then by Extension, G and N must be coextensive. So, if *m/N* doesn't instantiate *G*, *m/N* doesn't instantiate N. Thus, it won't do us any good to abandon Uniqueness unless our alternative permits counterexamples to Extension.

Although it isn't easy to see how we could come to terms with such permissive individuation conditions, it doesn't seem that the loss of Uniqueness (and with it, Extension) would be much of an impairment to the hylomorphic picture. Our grounds for accepting these principles in the first place were *already* shaky. We've seen that a viable hylomorphic response to the puzzles of material constitution must be able to accommodate the distinctions we're led to by putative applications of Leibniz's Law, and so *will* have as a consequence that reality is (in some sense) more fine-grained than it looks. However, that isn't yet a positive motivation for Uniqueness itself. We have no reason to expect that the fineness of grain required to deliver a satisfying answer to the target puzzles must be quite so extreme.

Full-fledged Uniqueness is ripe with unsettling consequences that haven't gone unnoticed, even by those who take it as their starting point. For example, Fine (1999) points out

[18] For a defense of the analogous strategy in response to Russell's paradox of propositions, see Uzquiano (2015).

that in the plural extension of the hylomorphic theory, given two stacked wooden blocks *a* and *b*, we shouldn't distinguish the tower *a,b/being on top of* from *b,a/being beneath,* because to do so would be to cut things too finely. Instead, he proposes an alternative individuation condition according to which embodiments are the same just in case "the state of *a, b*…standing in the relation *R* is the same as the state of *a', b'*... standing in the relation *R'*."[19] The intuitive idea here, I take it, is that although the relations come apart, what they require of the object that embodies them is the same.[20]

In general, failures of Uniqueness can be made palatable by reflecting on the difference between *embodying* and merely instantiating a property. When an object embodies a property, we say that the object is "shaped", "structured" or "qualified" by that property. Or, again from Fine: "...we might think of the form *F* in the matter-form combination *m/F* as a kind of mould to which the matter *m* is meant to conform."[21] I want to suggest that cases where Uniqueness fails are cases where distinct properties nonetheless impose the same "mould" on the objects that embody them. An individuation condition that appropriately respects the hylomorphic conception of embodiment should allow these cases. On this way of thinking, the initial argument is just more evidence that Uniqueness is too strong.

The only lingering concern is that this route will run afoul of the arbitrariness constraint. But that risk seems less pressing here. Abandoning Uniqueness doesn't compel us draw any arbitrary lines: properties are all on a par with respect to the theory, in that they are *all* eligible as forms. We don't have to take a stand on when properties are embodied, since there *aren't* any cases where an instantiated property fails to be embodied by anything. Rejecting Uniqueness simply allows that for certain properties, differences in extension may not always correspond to a difference in what is required of an object that embodies them. Whether there is a difference between something embodying *this* property and *that* one may -- unsurprisingly -- be sensitive to the base and property in question.

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[19] Fine (1999: 66)

[20] Fine (1999: 66). He writes: "...under this criterion, the same rigid embodiment may involve two distinct principles [or] forms." To be clear, though: Fine's case isn't obviously a counterexample to Extension, but can smooth our path in that direction.

[21] Fine (2008 : 112)

3 Conclusion

Of course, this discussion is far from conclusive. The second route leaves many questions unanswered: exactly how widespread are failures of Uniqueness? Is there *any* general principle of individuation capable of replacing it, or are we bound to proceed by cases? These questions all merit further investigation, but are better addressed with a more developed version of hylomorphism in hand. Nor do I take myself to have shown that the second route is conclusively preferable to the first. My goal here was more modest; I hoped to show that -- having noted the inconsistency of simple hylomorphism -- there *is* space to amend the theory without giving up an antecedent commitment to avoiding arbitrariness. Whichever way we turn, the tension between avoiding arbitrariness and maintaining a fine-grained conception of material objects is an interesting one, and presents an unexplored choice point for contemporary defenders of hylomorphism.

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