

Vagueness in Abundance and Absence*

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I Introduction

Ontic vagueness (which is, roughly, vagueness about what exists) is thought by most metaphysicians to be downright evil. Most anyone who knows about ontic vagueness thinks that a theory's entailing it counts a great deal against that theory; presumably this is because they think ontic vagueness is impossible.¹ One philosopher, Elizabeth Barnes, has argued that sparsist Aristotelian theories of properties entail ontic vagueness.^{2,3} Barnes argues for a dilemma: nominalism or ontic vagueness.⁴ Most of us do not want to admit to ontic vagueness, so her argument gives us a *prima facie* motivation for nominalism.

In this paper, I go further. I offer arguments that nominalist and abundantist and Platonist theories entail ontic vagueness. The upshot is that if one wishes to avoid ontic vagueness, one must endorse epistemicism, properties that are not possibly instantiated, or ostrich nominalism.

2 Vagueness in Aristotelianism

I shall first present briefly Barnes' arguments for ontic vagueness in sparseness.

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¹A notable exception is Barnes (ms).

²Barnes (2005). That is, if epistemicism about vagueness is false. Epistemicism says that there are facts of the matter about the application conditions of terms like 'bald' and 'tall,' we just cannot know what they are. Williamson (1994) is largely responsible for the legitimacy of epistemicism.

³By 'Aristotelian' I shall mean that such theories include the principle of instantiation, which says that there are no uninstantiated properties. Barnes argues that Aristotelian sparsists are committed to borderline cases of existence. Her arguments for ontic vagueness rely on properties that one must consider *genuine*, which rules out semantic vagueness; theories of semantic vagueness say that there are predicates which seem to express properties, but in fact it is vague which property is being expressed. This route is unavailable to those who think that the predicates in question express genuine properties.

⁴Barnes does not consider the view that there are uninstantiated properties (which I shall call 'Platonism') a tenable alternative.

2.1 Universals

According to sparse theories of properties, classically vague predicates like ‘is bald’ do not correspond to properties, but predicates about fundamental physical properties (like ‘is Einsteinium’) do.⁵ Since atomic bonds do not form instantaneously, there are times at which it is vague whether there is an atom of Einsteinium. Given Aristotelianism, then, it is vague whether the universal *being Einsteinium* exists. Note that the use of the predicate ‘is Einsteinium’ in the arguments rules out semanticist responses, since such responses rely on it being indeterminate which property is expressed by a predicate. A semanticist answer to the problem of vagueness says that sentences with predicates like ‘is bald’ are indeterminate in truth value; this is because ‘is bald’ does not express one property, but several. However, sparse and abundant property theorists alike ought to acknowledge that predicates expressing fundamental physical properties are not indeterminate in this way. Since Einsteinium is a fundamental physical property, abundantists and sparsists alike should grant that ‘is Einsteinium’ is not indeterminate; it expresses one and only one property—the property *being Einsteinium*.

However, this is only true given presentism; eternalists say that if there is an atom of Einsteinium at any time, then *being Einsteinium* exists *simpliciter*. However, the case can be modified. Consider a series of possible worlds, the first in which Einsteinium is definitely not instantiated, the last in which it definitely is, and at each world in between the atomic bonds get closer and closer to forming. At some worlds in the series, it is vague whether or not there is an atom of Einsteinium, and thus (given Aristotelianism) it is vague at those worlds whether or not *being Einsteinium* exists. Thus, ontic vagueness is true in those worlds, which entails that ontic vagueness is possible. But ontic vagueness is not just false, we think; it is impossible! This gives us reason to deny the existence of universals, if there is another option.

2.2 Tropes

The argument from tropes to ontic vagueness goes much the same as above. Since atomic bonds do not form instantaneously, there are times at which it is vague whether there is an atom of Einsteinium. Given Aristotelianism, it is vague whether that trope of *being*

⁵Einsteinium is an element discovered after the first hydrogen bomb explosion in 1952. It has since been duplicated in the lab. It is important to know for the purposes of this paper that the electron configuration of Einsteinium includes two electrons in the outer shell.

Einsteinium exists. And in any world in which there is at least one instance of vague Einsteinium, it is vague whether that Einsteinium trope exists. Thus, ontic vagueness is possible.

3 Vagueness in Platonism

The distinctive of Platonism is that there are some uninstantiated properties. So the Platonist has an easy response to Barnes' argument: the property *being Einsteinium* exists at all times and in all worlds, since it is instantiable.⁶ It is never vague whether or not *being Einsteinium* exists. But we may ask the Platonist this question: are there properties that are uninstantiable, such as *being a round square*? If so, we ought to wonder why. After all, uninstantiable properties (if they were to exist) would play so few of the roles that properties play. Properties are ways a thing could be, and uninstantiable properties are not. Properties explain similarity and difference of objects, and uninstantiable properties do not. Properties explain why a thing is the way it is, and uninstantiable properties do not. The only property role that uninstantiable properties play is that they can be said of things. But the property *being Florgedegork* can be said of things, and just as many things have it as have *being a round square*. Is there a property *being Florgedegork*? If so—if there are uninstantiable properties—there are just too many properties playing too few of the property roles. We ought to think that a necessary condition for being a property is being instantiable, and that there are no uninstantiable properties.⁷

So let us assume that there are no uninstantiable properties.⁸ Another distinctive of the Platonist position is that *every* instantiable property exists in every world. Otherwise the view would seem intolerably arbitrary with respect to which properties there are. There would be some instantiated properties and some uninstantiated ones; but which uninstantiated ones? And there would be no principled reason that those uninstantiated properties, and not some others, exist. So let us assume that the most plausible Platonist view is that all and only the instantiable properties exist.

⁶I shall call properties that are not instantiated in any world 'uninstantiable', and properties that are instantiated in at least one world 'instantiable'.

⁷A notable detractor to this view is Chisholm (1996), especially p16.

⁸I am aware that there are detractors, so I leave this as an available out. If one is a Platonist who admits uninstantiable properties, one's view does not entail ontic vagueness. But if there are such properties (if they even merit being so called), here's one: *being non-self-exemplifiable*. That way leads to paradox, but what principled non-*ad-hoc* reason would one have to exclude it?

Now consider the property *being Einsteinium*. As Barnes points out, since atomic bonds do not form instantaneously, there are times at which it is vague whether anything is Einsteinium. The Platonist must treat *being Einsteinium* as a genuine property, since it is instantiable. All Einsteinium atoms have two electrons in the outer shell; but it is vague at what distance from the nucleus an electron counts as being in the outer shell. Let us say that in order to be definitely in the outer shell, an electron must be n millimeters from the nucleus. In order to be definitely not in the outer shell, an electron must be m millimeters from the nucleus.⁹ Consider, then, the conjunctive property *being Einsteinium and having an electron between n and m millimeters from the nucleus*.¹⁰ There are worlds in which this property is definitely not instantiated (like worlds with no electrons), and there are *no* worlds where it is definitely instantiated, and there are some worlds (including this one) where it is vague whether or not it is instantiated. Since it is possibly vaguely instantiated and not possibly definitely instantiated, and since the Platonist is committed to the existence of any property which is possibly instantiated and to the claim that there are no properties which are not possibly instantiated, she is committed to the vague existence in every world of the property *being Einsteinium and having an electron between n and m millimeters from the nucleus*.

One can see how this easily generalises. Take any property P whose satisfaction conditions are vague. Conjoin it with another property, *being* $\lceil \phi \rceil$, substituting for ' ϕ ' the condition(s) under which P is vaguely instantiated. Now we have a new property, *being P and ϕ* . It is vague whether *being P and ϕ* is instantiated in any world, and thus vague whether or not it exists. And if it is vague whether it exists in one world, then it's vague whether it exists in every world.

Another way to do this is to just pick one instance of vague property instantiation and construct a property. For example: take some object such that it is vague whether that object is an atom of Einsteinium—call it 'Erin'. Erin has one electron determinately in its outer shell, and another y millimeters from its nucleus. Then it is vague whether the property *being Einsteinium and having an electron y units from your nucleus* is instantiable. And thus it is vague whether it exists. Since the Platonist is committed to these being genuine properties if they exist, she is committed to ontic vagueness just as much as the Aristotelian.

⁹Of course, there is also higher-order vagueness. Since the satisfaction conditions for Einsteiniumhood are vague, it is vague exactly what n and m are. And of course, n and m are going to be very, very small numbers.

¹⁰Thanks to AS for a suggestion along these lines.

Objection 1: Why not say that there are no properties that are definitely not instantiated in any world? That is, why not say: For ever property P , it is not the case that: in every world, P is definitely not instantiated.¹¹

Reply: This is almost as bad as admitting uninstantiable properties. Take one of the conjunctive properties from above. Is it instantiable? One cannot say yes; one must say that it is vague. So, is it a way something could be? Again, it is vague; it is a way a thing *maybe* can be.¹² So it is vague whether or not the above properties can play either of the two roles that properties are supposed to play. That is quite dissatisfying. One property role they *can* play is being said of things.¹³ But that is the *only* role these properties (like *being bald and having y hairs on your head*) can play. And it seems that positing all these properties is not worth it, if that is the only thing we get. Of course, this is not a knock-down argument. But this is metaphysics; there are rarely knock-down arguments. One must weigh the costs and benefits, and in this case, the costs far outweigh the benefits.

Objection 2: Why not say that there is a relation of vague instantiation (hereafter ‘vinstantiation’), and that vinstantiation determinately exists, and that anything that is vinstantiated exists?

Reply 1: Instantiation is already mysterious enough! Positing an instantiation-like relation that is not instantiation surely should be seen as a substantial cost. Furthermore, what makes vinstantiation an instantiation relation rather than some other kind of relation? An instantiation relation holds between an object and a property, and it is in virtue of the object standing in the instantiation relation to the property that it has the property. If an object vinstantiates a property, it does *not* have the property. It vhas the property, and it is not at all clear what vhaving is. So it is not at all clear that vinstantiation can do the work it is supposed to.

Reply 2: This will require an infinite number of vague relations. Since there is higher-order vagueness, then much like it is vague whether or not something that has one electron determinately in its outer shell and another y millimeters from its nucleus, it is vague what value y is. So there are objects such that it is vague whether they vinstantiate *being Einsteinium*. And there are some objects such that it is vague whether it is vague

¹¹This objection is due to MR.

¹²Where ‘maybe’ is not to be read epistemically, but metaphysically. I am not even certain what it could mean to say that, other than that it is vague.

¹³This is the view of van Inwagen (2004), who thinks that properties are assertibles.

whether they vstantiate *being Einsteinium*. And so on. Again, the price seems a high one.

4 Vagueness in Nominalism

The nominalist thinks that there are no universals that are instantiated by particulars; rather, there are just particulars. But the nominalist still must give an account of why some subject-predicate sentences are true and others are false, and how it is that some objects are more alike than other objects. (At least, most nominalists try to.) There are three popular nominalist accounts. The first, set-membership nominalism, says that predicates (like ‘is red’) refer to sets or proper classes of objects which satisfy them.¹⁴ Similarity is then explained in terms of mutual set or class membership. The second, resemblance nominalism, says that predicates (like ‘is red’) are true of objects if and only if the objects resemble a paradigm red object. Then similarities between objects are grounded in primitive resemblance relations.¹⁵ The third, ostrich nominalism, says that predicates are true of objects if and only if the predicates are true of objects.¹⁶ The views will be explained in more detail in the sequel.

4.1 Set-Membership Nominalism

The set-membership nominalist believes in only two kinds of things—concrete objects and sets. Sets are abstract objects, and have as members other sets and/or concrete objects. For every collection of sets and/or concrete objects, there is a set with all and only those things as members. The set-membership nominalist then identifies properties with sets. So, the referent of the predicate ‘is red’ is the set of all and only red things.

The set-membership nominalist thinks that the predicate ‘is Einsteinium’ refers to the set of Einsteinium atoms. That is, there is a set whose members are all and only Einsteinium atoms, and the predicate ‘is Einsteinium’ refers to that set. The set-membership nominalist is committed to the existence of a set of things that are Einsteinium and she is committed to that set’s being the referent of the predicate ‘is Einsteinium.’

¹⁴See Quine (1948) and Lewis (1983).

¹⁵See Price (1962) and Rodriguez-Pereyra (2002).

¹⁶For a defence, see Devitt (1980), and for an attack, see Armstrong (1980).

So, the set-membership nominalist is committed to the existence of a set of Einsteinium atoms; call it ALBERT. However, there is at least one thing x such that it is vague whether x is an Einsteinium atom. Consider the set containing one determinately Einsteinium atom; call it S_1 . Add one determinately Einsteinium atom to S_1 ; call that set S_2 . Add another; call it S_3 . And so on. When you run out of determinately Einsteinium atoms, start adding indeterminately Einsteinium atoms—things such that it is not determinate that they are Einsteinium atoms, and it is not determinate that they are not. Eventually the result is a set containing all the determinately Einsteinium atoms and all the indeterminately Einsteinium atoms; call it S_n .¹⁷

Now, let us ask: is S_1 identical to ALBERT, or is S_2 identical to ALBERT, or ... or is S_n identical to ALBERT? The answer must be that it is vague. And vague identity entails vague existence. It is vague whether there exists something that is identical to both ALBERT and S_1 , and it is vague whether there exists something that is identical to both ALBERT and S_2 , and so on.¹⁸ So, set-membership nominalism entails ontic vagueness.

4.2 Resemblance Nominalism

Resemblance nominalism grounds similarity between objects in brute similarity relations. These relations are sometimes taken to be universals, but this is a nominalism not worthy of the name. So I shall assume that they are particulars.

Take some determinately Einsteinium atom A , and some thing B such that it is vague whether B is an Einsteinium atom. Do A and B resemble each other with respect to being Einsteinium? The answer must be that it is vague whether or not they do. So, is there a resemblance relation that A and B stand in? Again, it is vague. Since we are treating resemblance relations as particulars, we are left with vagueness as to whether or not a particular resemblance relation exists; this is ontic vagueness.

Furthermore, for every object and property such that it is vague whether the object instantiates the property, it is vague whether or not there is a corresponding resemblance relation. For there will be a vaguely existing resemblance relation between it and the paradigm case of the property, and then (depending on one's view) a vaguely existing

¹⁷Due to reasons of higher-order vagueness, it seems like it is also vague which set S_i is the set that contains all the determinately Einsteinium atoms and none of the indeterminately Einsteinium atoms, since the satisfaction conditions for Einsteinium are vague. It might even be vague which set is identical to S_n . This strengthens my argument.

¹⁸If it is vague whether $a=b$, then it is vague whether $\exists y(y=a \ \& \ y=b)$.

resemblance relation between it and each object that obviously satisfies the predicate, and then (depending on one's view) a vaguely existing resemblance relation between it and each object such that it is vague whether the object satisfies the property.

Some resemblance nominalists do not believe there is any relation that holds between two red things. They say that ' x is red and y is red' is true in virtue of the fact that x resembles y , and leave the latter unanalysed. This also entails ontic vagueness. Take some determinately Einsteinium atom A , and some thing B such that it is vague whether it is an Einsteinium atom. Do A and B resemble each other with respect to being Einsteinium? The answer must be that it is vague whether or not they do. So, is there a fact that A and B resemble with respect to being Einsteinium? This must also be vague.¹⁹ So, it is vague whether or not a certain fact exists.

In view of this, the resemblance nominalist might take a further step back. She could say that ' x is red and y is red' is true because x resembles y , and leave the latter unanalysed. Call this 'ostrich resemblance nominalism'. Ostrich resemblance nominalism provides nothing in the world to ground the similarity of objects. What I say in §4.3 about ostrich nominalism applies to ostrich resemblance nominalism as well.

Objection: Why not just posit vague resemblance relations? Then we can say that A and B determinately stand in a relation of vague resemblance; but that is not ontic vagueness.

Reply 1: Do they also stand in a determinate resemblance relation? The answer must still be that it is vague. Even if I grant vague resemblance relations and agree that A and B stand in one, I still demand to know whether they stand in a determinate resemblance relation. And it is vague. So, this response gets us determinate vague resemblance relations, but we are still left with vague determinate resemblance relations.

Reply 2: One could respond along the lines of what Williamson calls higher-order vagueness (2004; look first at p3-5). Let us say it is vague whether A and B stand in a resemblance relation. But at some point they come to determinately stand in that resemblance relation. We can ask, "At what point did they determinately stand in that determinate resemblance relation?" This will also be vague. However, putting the response this way allows for the resemblance nominalist to respond by adopting a

¹⁹Note that the proponent of cannot deny the existence of facts, since she grounds the truth of resemblance claims in facts.

semantic solution, whereas Response 1 does not.

4.3 Ostrich Nominalism

The ostrich nominalist says that an object o satisfies a predicate ‘is P ’ if and only if the following is true: “ o is P .” Another way of stating ostrich nominalism: o is P if and only if the predicate ‘is P ’ applies to o . Or a third way: o is P if and only if o is P .²⁰ Even if it is vague whether o is P , this cannot lead to ontic vagueness. However, it leaves as a brute fact that it is vague whether o is P . But that is not even quite right, because if it is vague whether or not o is P , then it is vague whether there exists a brute fact that o is P . So the ostrich nominalist must do without facts, leaving ‘ o is P ’ as completely unanalysable; she cannot even explain its truth in virtue of a fact, else she is left with ontic vagueness.²¹ This kind of ostrich nominalism does not even *try* to provide a ground for predicate assignments or similarity and difference. That is a disadvantage. However, it does not entail ontic vagueness, which many will see as an advantage.

5 Conclusion

When the conclusions herein are conjoined with Barnes’ conclusions, we are left with four options: 1) ontic vagueness, 2) epistemicism, 3) Platonism that admits uninstantiable properties, or 4) ostrich nominalism. (1) is anathema to most metaphysicians. (2) used to be anathema, though it has enjoyed some positive attention recently.²² Its downside is that it goes against our intuition by forcing us to say the following: there is an exact number of hairs n such that someone who has fewer than n hairs is determinately bald, and someone who has more than n hairs is determinately not bald. Furthermore, according to epistemicism it is in principle impossible for us to know the value of n ! (3) requires a radical revision in our understand of properties. Properties are supposed to be ways a thing could be, and they are supposed to explain similarity and difference; uninstantiable properties are ways nothing could be, and since nothing could have them, they cannot explain similarity or difference. (4) leaves our predicate assignments

²⁰I do not mean to suggest that these are equivalent; that would take an argument, and I do not think it is important to give one here. But each has a claim on the title ‘Ostrich Nominalism’.

²¹Though the ostrich nominalist may not believe in facts, strictly speaking, in which case she is left with no ground for predicate assignments.

²²See Sorensen (1988) and Williamson (1994).

completely unexplained, which is dissatisfying. But if the arguments in this paper are right, one must adopt (2), (3), or (4) to avoid ontic vagueness.

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