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Why Vagueness Is a Mystery

This paper considers two "mysteries" having to do with vagueness. The first pertains to existence. An argument is presented for the following conclusion: there are possible cases in which 'There exists something that is F' is of indeterminate truth-value and with respect to which it is not assertable that there are borderline-cases of "being F." It is contended that we have no conception of vagueness that makes this result intelligible. The second mystery has to do with "ordinary" vague predicates, such as 'tall'. An argument is presented for the conclusion that although there are people who are "tall to degree 1"—definitely tall, tall without qualification—, no greatest lower bound can be assigned to the set of numbers n such that a man who is n centimeters tall is tall to degree 1. But, since this set is bounded from below, this result seems to contradict a well-known property of the real numbers.

Keywords: vagueness, borderline cases, sorites, existence, composition

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The sensible view of vagueness is that vagueness is entirely a matter of predicates having possible borderline cases. To specify the meaning of a predicate is to give a set of instructions for its use, and no set of instructions can cover every possible situation; in consequence, no matter how carefully we specify the rules for using a predicate, there will be possible cases in which it is indeterminate whether that predicate applies. (And, as many writers have pointed out, when one introduces a new predicate, there will normally be good, practical reasons, for leaving it indeterminate whether it applies in possible cases in which one *could* render its application determinate.) It would seem, therefore, that all predicates must have possible borderline cases; and many predicates will have actual borderline cases. It is these actual borderline cases that account for all actual cases of vagueness—that is, all cases of assertions that are syntactically and semantically unobjectionable and are yet neither determinately true nor determinately false. (Someone's statement that Fred is bald, say, or that Mary is tall.)

But do all predicates have possible borderline cases? Pure mathematics provides a class of possible counterexamples, but I will not discuss them. There are certain special predicates that advocates of the sensible view of vagueness will agree have no borderline cases, and this is no grudging concession on their part, but an important component of the sensible view. These are the predicates that can be constructed using only the language of first-order logic—that is, first-order logic with identity, for it is only when the identity-sign has been added to the language of logic that it is possible to construct predicates entirely out of logical materials. Two important examples are '$x = x$' and '$x = y$'. (I will not distinguish between predicates and the open sentences that are their typical instances.) The former expresses the attribute of existence (being equivalent to '$\exists y\ y = x$') and the latter the relation of identity. According to the sensible view of vagueness, *these* predicates have no borderline cases, for existence and identity have no borderline cases. "Identity, properly speaking, knows no gradation," says Quine, and Chisholm has made a similar remark about existence. It is, according to the sensible view of vagueness, predicates whose meaning is specified by a set of instructions (instructions that determine whether that predicate applies to a given object or sequence) that are vague—that must have possible, and will often and in important cases have actual, borderline cases. There can be no borderline case of existence, because an object has to *be there* to be a borderline case of *anything*, and, if it's there it exists. There can be no borderline cases of identity because an object x and an object y are either two objects or one; if they are two, they are not identical, and if they are one they are. If there were borderline cases of existence, there would be sets each of which was such that it was indeterminate whether it was the empty set. If there were borderline cases of identity, there would be sets such that it was indeterminate whether they had one or two members. And these things are simply impossible. Vagueness, according to the sensible view, takes up only where logic has left off. Vagueness arises when we draw boundaries and arises because it is humanly impossible to draw any boundary such that every possible object is definitely inside or definitely outside that boundary. But in logic there is no drawing of boundaries.

In my view, the sensible view of vagueness, appealing as it is, cannot accommodate a workable metaphysic of the material world. Any attempt to spell out in detail a metaphysic of the material world that incorporates the sensible view of vagueness (which denies that there can be indeterminate cases of identity and existence) will demonstrably have consequences less appealing, or more appalling, than a rejection of the sensible view of vagueness. There is a lot that could be said about this. I could write a book. Here I must content myself with an example. When we attempt to construct a metaphysic of the material world, one of the questions we must answer is, "When are things proper parts—when do things together compose some larger whole?" Suppose, just for the sake of having an illustration, that we say that things compose a larger whole when and only when they are in physical contact. (Thus, twenty blocks spread about on a floor compose nothing; when a child builds a tower out of them, they compose something: a tower of blocks.) Now suppose the world consists of two blocks—each exactly the same size and shape as the other—floating about in otherwise empty space; suppose that at one time they are not in contact and that a moment later they drift together and are in contact. If current physics is correct, there must have been some moment *t* at which it was indeterminate whether they were in contact. (And this is not only a consequence of current physics but of the sensible view of vagueness, at least in the rather strong form in which I stated it.) Consider that moment, *t*, at which it is indeterminate whether the two blocks are in contact. Ask this question: Does there then exist anything larger than a block? It cannot be definitely true that there then exists something larger than a block, for this could be true only if there were definitely something the two blocks were parts of; and there could definitely be something the two blocks were parts of only if the two blocks were definitely in contact. A parallel argument shows that it cannot be definitely false that there then exists something larger than a block. So we have a case of indeterminacy—from the point of view of our simple possible world, an actual case. According to the sensible view of vagueness, this must be because in our simple possible world there is something that is a borderline case of "is larger than a block." But what is it? It is not either of the blocks, each of which is a determinate case of "is *not* larger than a block." And, if they have proper parts, it certainly not any of *them*. Could it be their mereological sum, the thing they compose? This suggestion will not do because it is not determinately true that there is such a thing, and we are thus not in a position to assert, "The sum of the blocks is a borderline case of 'is larger than a block'." (And, of course, even if we were in a position to make assertions implying the existence of the sum of the blocks, this would not enable us to explain the case of indeterminacy we want to explain, for the sum of the blocks would not be a borderline case of 'is larger than a block'; it would be quite definitely twice the size of a block.) Our simple possible world seems to contain no other candidate for the office "is a borderline-case of 'is larger than a block'." It would seem, therefore, that the assertion "There exists something larger than a block" is of indeterminate truth-value, and that we cannot explain this indeterminacy by saying "There is something that is a borderline case of 'is larger than a block'."

It is instructive to compare this example with a case in which the sensible view seems to provide a correct explanation of indeterminacy. Suppose that Socrates is wiser than everyone else; suppose that Socrates is a borderline case of wisdom; suppose that everyone else is definitely unwise. Then it is indeterminate whether anyone is wise, and the explanation is a straightforward one: there exists someone such that it is indeterminate whether the predicate 'is wise' applies to that person; there exists no one such that the predicate 'is wise' determinately applies to that person. But in the "Two Blocks" case, I cannot make the assertion that corresponds to "There exists someone such that it is indeterminate whether the predicate 'is wise' applies to that person": I cannot say, "There exists something such that it is indeterminate whether the predicate 'is larger than a block' applies to that thing."

If the sensible theory is correct, however, the *only* way to explain the indeterminacy of truth-value of 'There exists something larger than a block' is to assert the existence of an object such that it is indeterminate whether 'is larger than a block' applies to it. If our simple possible world is indeed possible, therefore, the sensible theory is wrong. But if the sensible theory is wrong, then vagueness is a mystery, for we have no idea how to explain cases of vagueness otherwise than in the terms the sensible theory provides. In our simple possible world, *existence* is vague: it is indeterminate whether there exists a mereological sum of the two blocks, and *not* because there exists something that is a borderline case of 'is a mereological sum of the two blocks'. And the idea of vague existence is a mystery; we understand vagueness, at least to some degree, when it can be explained by reference to indeterminately drawn boundaries; but cases of indeterminate existence cannot be explained by reference to indeterminately drawn boundaries.

I contend this: any carefully worked-out metaphysic of the material world will either present us with cases of indeterminate existence (and with cases of indeterminate identity; I will not discuss these) or else will have consequences that embody even more unpalatable mysteries than the mystery of vague existence: for example, that there are no such things as you or I, or that each of us has a certain precise span of existence—say, 81.23872 ... years—*essentially*. For my part, rather than accept either of these two propositions, I should prefer to suppose that vagueness is something that (like self-reference, consciousness, time, and free will) we have no coherent understanding of.

I want now to set out a second and (so far as I can see) unrelated mystery that pertains to vagueness. Let's look at a case of "ordinary" vagueness, a case involving a vague predicate—say 'is tall'. By a 'man' let's understand a currently living Northern European adult male. It is obvious that some men are just *tall*. For example, we can apply the word 'tall' to a 200 cm-tall man without hesitation, apology, qualification, or fear of contradiction. And it is equally obvious that some men are just *not tall*—a man who is 150 cm tall, for example. But not everyone falls into these two categories. A frontier of some sort separates them. A moment's thought will show that the frontier cannot itself have precise boundaries. If it did, then there would be some height that marked the greatest lower bound of the category "just *tall*: tall without qualification." But there is no such height. It is not 186 cm and it is not any other particular height, either. That is to say, it does not exist.

There is, therefore, a second frontier, separating "just tall" from the frontier that separates "just tall" from "just not tall." It is easy to see that there can be nothing pertaining to tallness that is, like space, the *final* frontier. The final frontier would have sharp boundaries, and there would be what we have seen there is not: a height that marks the greatest lower bound of the category "just tall." Might we then want to think of tallness as a matter of *continuous* degree? Might we want to think of the possible degrees of tallness as forming a continuum, as being structured like the real numbers? If this suggestion is right, some men, such as the ones who are 200 cm tall are tall to degree 1 and others, such as the ones who are 150 cm tall, are tall to degree 0. And in between these two boundary points, there will lie a continuous spectrum of degrees of tallness. (A man who was 181.5 cm tall would presumably be tall to one of these intermediate degrees.)

If you think about it, however, this suggestion is pretty mysterious. Can there be anything in the physical world—which I take to include not only human beings and their dimensions, but also the dispositions of English-speakers to apply the word 'tall' in various circumstances—that can attach a particular man (as he is at a particular moment) and the English word 'tall' to a particular real number—say, to $\pi/7$ rather than to some real number that differs from $\pi/7$ only after the billionth decimal place? Even if we suppose that there are a finite number of degrees of tallness (and it's not easy to do this in any explicit and well-motivated way: what number would this finite number be, and why was it chosen rather than its successor?), the idea can seem mysterious. If there are twenty-three degrees of tallness, what is it that attaches degree 3 (or whatever) to the height 186 cm?

Some of you may already have noticed that there is something more than a mystery here. There is a real paradox. This paradox was pointed out to me by Mark Heller[1]. Suppose that we think of something—parthood or tallness or whatever—as coming in degrees, one of which corresponds to full possession of the property or full participation in the relation. If tallness comes in degrees, then, surely, "1" is one of the degrees, for a 200 cm-tall man has to be thought of as tall to the degree 1. But then what is the *least* height such that a man of that height is tall to the degree 1? (Or, if "heights" compose a continuum, what is the greatest lower bound of the set of heights such that a man who is of one of the heights in that set is tall to the degree 1?) It seems absurd to suppose that there is such a height. What would it be, and how would the components of the physical world operate to fix it? Could it have been different? Is it possible that a different such "least height" is associated with the German word 'lang' from the one that is associated with the English word 'tall'? And yet how can there *not* be such a height? The real number 200 has the property expressed by the open sentence 'if x measures the height in centimeters of a man, then that man is tall to the degree 1'. And the set of numbers that has this property has a lower bound, for neither the number 150 nor any smaller number has this property. But if a non-empty set of real numbers has a lower bound, then it has a greatest lower bound; this sentence expresses a "non-negotiable" property of the real line. I have no idea how to resolve this paradox.

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[1] It later appeared in his book *The Ontology of Physical Objects: Four-Dimensional Hunks of Matter* (Cambridge: Cambridge University Press, 1990). See Chapter 3, sections 8 and 9.

Received: May 2002

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